

**INTEGRATION OF ENVIRONMENTAL EDUCATION INTO  
ETHIOPIAN PRIMARY SCHOOL CURRICULA WITH PARTICULAR  
EMPHASIS ON JIMMA ZONE OF OROMIA REGION**

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## **Abstract**

Environmental Education (EE) has been recognized by international community as response to environmental concerns and problems (mainly induced by human activities) to be integrated into their respective educational systems. Accordingly Ethiopia considered EE in its policy and strived to incorporate environmental components into all school subjects. In spite of policy provision and efforts of integrating EE components into all primary school subjects, currently environmental problems and crises are getting diverse and complex. Proper understanding of environment, issues, and its systems, human-environment interrelationship, as well as developments of a sense of environmental concern and caring behavior are visibly lacking.

This study was intended to investigate the integration of EE into all subjects of Ethiopian Primary Schools as indentified from primary education curricular document-textbook, and perceived and practiced by primary school teachers. The study was supported by ideas and views obtained from international and national literature review, particularly underpinned by EE integrative model of Palmer (1998). Qualitative case study method was employed to generate empirical evidence, where four primary schools were purposely selected and included in the study. The data were obtained from 16 textbooks reviewed, 22 primary school teachers' interviewed, and 5 lessons observed. The first two sources were identified using purposive samplings while the last via convenient sampling.

The result revealed that EE as currently planned and taught in primary school curriculum is not sufficiently integrated into all primary school subjects as intended. The finding confirmed that though EE is believed to be integrated into every subject of the school curriculum its integration found to be different in coverage and approach by subjects and cycle. It is only sufficiently integrated into science subjects notably biology and geography from social studies mainly based on the matching of these subjects contents with the EE contents. It was also found that EE components waere integrated and taught in education about the environment mode than balancing with education in and for the environment perspectives. The findings of the study further disclosed inconsistence between integration of EE at curriculum level and the practice of integration at teaching, lack of clear criteria and facilitating body for the integration of EE components into all subjects was reported as barriers among others. Rigid teaching approach, (manifested in form of textbook confined, classroom limited, teacher controlled methods and rare use of examples from

real environment) was also noted as limiting factor. Thus, the finding suggests EE as presently designed and taught is constrained to lead to the attainment of environmentally literate, concerned and responsible citizen. Subsequently, this study seeks to reinforce EE and its integration into all school subjects and its actual integration at learning level. It is also suggested the related actors' notably educational theorists', educators, policy makers and curriculum developers and teachers to review and rework their roles to respond to the gaps implied. In conclusion the study proposes a modified integrative EE model to be considered for mainstreaming and teaching EE components in primary school subjects.

### **Key Words**

**Environment, sustainability, environmental education, integration, integrated curriculum, education about, in and for the environment**

# **INTEGRATION OF ENVIRONMENTAL EDUCATION INTO ETHIOPIAN PRIMARY SCHOOL CURRICULA WITH PARTICULAR EMPHASIS ON JIMMA ZONE OF OROMIA REGION**

## **Chapter One: Introduction**

### **1.1. Background of the study**

It is evident that almost for larger span of their lives on the planet; humans have existed in harmony or in sustainable ways with their environment. However, within the last two centuries, humans-nature relationship has been changed and humans domination over nature took shape, where human activities have had exerted tremendous impact up on the environment and its resources. Possibly, according to Postma, (2006) and Leena, (1984) this impact became extremely serious within the last half century.

Studies like that of Kemp (2004) disclose that, the severe pressure and threat of human activities (be it productive or consumptive) to the environment and its resources, have increasingly affected the earth's carrying capacity, and disturbed the balance of natural system. Kemp argues that in absence of human interference there would be no environmental problems. It is also contended that, the impact of human activities upon the environment become disruptive with the world's unsustainable production and consumption pattern possibly as it is experienced by technologically advanced cultures (Amy, 2011) and rapid population growth. In this connection, it was reported that the world human population was 7 billion as of October 2011, and projected to be 9 billion by 2050 (Hollweg, et al., 2011). Consequently, human's pressure on global ecosystem and the impacts emerging following these interactions cannot be expected to decline; and the need for food, clean water, fuel, and space will also increase. Moreover, human activities cause ever increasing disruption to the essential resources of the planet such as land/soil, water, air, energy and other biotic aspects which are basic and life sustaining on the earth.

Even though the environmental crises are complex and not easy to point out its degree here, it seems logical, however, to cite some instances of environmental degradation of varied dimensions as documented so far. For example, according to Palmer (1998) about 70% or 3.6 billion hectare of the dry land of the world is already degraded. It is also indicated that 'US industries alone release

some 11.4 billion tons of hazardous wastes to the environment yearly', perhaps as a consequence of such effluent added to the atmosphere, 'roughly 80% of the European forests have been damaged by acid rain' (Orr, 2004:6-8). The seriousness of the environmental problems appears concrete and even seems critical beyond the current discourse. This notion has been confirmed by the assertions made at a United Nations' meeting:

Due to global warming derived by human activities very likely world people is expected to face displacement of millions of people caused by the rise of sea levels, extreme water shortage (affecting one in six of world population), drought (creates tens of millions of climate refugees) and extinction of about forty percent of wild life, insects and different species (King-Tak Ip, 2009:11-14)

Hence, the implication of this adverse impact inevitably concerns all humans. Ethiopia, sharing this concern, experiences varied types of environmental degradations. In this regard, research results reveal that Ethiopian environmental conditions have been exposed to devastating threats where essential resources for example soil and natural forests are being depleted. It was found out that due to rapid population growth, since 1900, more than 90% of Ethiopian forest cover has been stripped for fire wood, farm land and the like, causing over one billion ton of top soil loss every year (Adugnaw 2014; Geachew, 2008). This observation can be comparable to the later trends of deforestation and associated problems. In this regard Adugnaw (2014) reviewing studies revealed that forest coverage in Ethiopia has been diminished from about 40% to less than 3% within less than a century. The consistently reported findings further showed that natural forest coverage of the country has been decreased at faster rate from 40 percent a century ago to less than 3 percent currently (Cheng et al, 1998; Badege, 2001; Geachew, 2008; Berry, 2003 as cited in Adugnaw 2014). Getachew specifically indicated that by late 1980s and 1990s only 2.3 percent of Ethiopia remained under natural forest cover. The rate of deforestation appears magnificently high in Ethiopia, though varying documented as ranging between 80,000 to 200,000 hectares of forest per annum (EPA, 2003), which is estimated to vary from 160,000 to 200, 000 hectares per year (Badege), and still estimated to 150, 000 to 200,000 hectares per annum (Geachew, 2008). Subsequently without forgetting the diverse importance of natural vegetation in general and forest in particular, it was identified that over 400 tons of soil degraded yearly (Hurni, 1988 cited in Daniel, 2007); fertile top soil lost at an estimated rate of one billion cubic meters per year (Kuru, 1990; Yirdaw, 1996 cited in Badege, 2001).

Other studies have also illuminated similar results on environmental degradation notably; urban environment such as poor sanitation facilities, disposal of bulks of solid waste and industrial effluents without any treatment was revealed (Daniel, 2007: 2). Supporting this impression, the CSA (2007) reported that out of the total house unit surveyed at national level, about 69.8% dispose waste materials in open space/behind their housing or dump in rivers or burn. Lack of toilet facilities (66.7%) and potable water (54.5%) are also among the problems CSA identified. Thus, from these empirical evidences, it is apparent that there are indicators of severe environmental problems in Ethiopia that require further resolutions. Hence, there is little doubt that if such and other disruptive activities continue with similar pace in the world, inevitably, the life on the planet will be increasingly exposed to more danger. Therefore we cannot ignore issues of environment; problems and concerns over sustainability. In this regard the understanding emerging suggests the need for changes in human thinking, concerns and action pertaining to their relationship with natural environment, and with each other. Then, I could claim that, though education is a crucial tool for such transformation but the question is what kind of education resolve these problems.

Hence, following the intense human intervention on the earth and its subsequent threatening outcomes, the need for education that produces responsible citizens towards the nature, environment and its resources emerged. The global community's concern about the state of the earth and our relationship with it, had led to the emergence of Environmental Education (EE) program, which has been further intensified through consecutive discussions made and principles set at successive international conferences that ranged from Stockholm, 1972, through Belgrade, 1975; Tbilisi, 1977; Brudland, 1987; and Rio, Summit 1992; to Johannesburg, 2002; (Palmer, 1998; Bodzin, et al., 2010; Spiropoulou, et al., 2007). It is argued that 1970s and 1980s is considered as a turning point for public concern (both developed and developing world) about the environment, where they demonstrated increased effort to integrate EE program into their educational systems at all levels. The program aimed at producing an informed citizenry, who care about the future of the planet and engage in appropriate pro-environmental behaviors (Palmer, 1998:36). More interestingly, the outcomes of Tbilisi conference and Rio Summit are considered as important sources of EE goals and principles, and the idea of sustainability, respectively.

In line with the agreed upon EE goals and guiding principles Ethiopia, has also given considerable emphasis to environmental education and conservation and strived to incorporate EE in its educational system. The policy and strategies currently provided pertaining to environment and development issues by the government demonstrate the concern and consideration given to environmental issues and EE. Among these, the provisions of Ethiopian constitution about sustainable development, clean and healthy environment (TGE, 1995); the Education and Training Policy (TGE, 1994; MOE, 2010); and the Federal Environment Policy provided in 1997 are crucial ones. The national level intent, pertinent to development and environment, is clearly indicated in the various articles of the Constitution. For example, under the chapter proclaiming about human right it is stated:

The Peoples of Ethiopia as a whole, each Nation, Nationality and People in particular have the right to improved living standards and sustainable development (article, 43(1)); all persons have the right to a clean and healthy environment (article, 44(1)).

These legitimated rights to live in healthy environment and lead quality life requires setting policies that foster the enhancement of environmental awareness and caring responsibilities. It seems this is reinforced by article 92 (2 and 4) of the constitution that declares that, “The design and implementation of programs and projects of development shall not damage or destroy the environment” and “Government and citizens shall have the duty to protect the environment” (TGE, 1995).

Within these context policy directions aiming at citizenry of environmentally literate, responsible and concern for sustainable use of environment and its resource have been provided. For instance, the Education and training policy of 1994 and Environmental policy of Ethiopia of 1997 respective objectives are hopped to set frame of reference along the line mentioned earlier. In this regard, the Environmental Policy goal states:

To improve and enhance the health and quality of life of all Ethiopians and to promote sustainable social and economic development through the sound management and use of natural, and cultural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs (EPA, 2012).

It appears clear from the purpose set by the country's environmental policy that proper understanding, careful utilization and protection of environment and its resource, may contribute to the sustainable development and benefit every citizens those of present and future. Education and Training policy also stipulates objectives that focus on development and environment.

One of the objectives of Education and Training policy reads as follows:

Bringing up citizens endowed with human outlook, country wide responsibility and democratic values having developed the necessary productive, creative and appreciative capacity in order to participate fruitfully in development and the utilization of resources and the environment at large (TGE, 1994:6).

Along this angle of discussion it is evident that, in the policy 'action plan', ESDP-IV, currently EE is outlined as one of the cross-cutting issues- 'those which do not relate to a specific sub-sector but are of relevance to the whole education sector' (MoE, 2010:104-105); whereby, the focus is placed on core areas of curriculum at all levels and the awareness building about environmental issues and concern targeting administrative and teaching staff.

This suggests that humans wherever they live, be it in developed or developing region, understand that their welfare is dependent on the proper utilization and management of the environmental resources. However, in the context of environmental sustainability or education for sustainable development though contested, it is argued that in developing countries education is not actually contributing to the development demands of their respective nations as desired (Ockwell, D. et al., 2010). For these authors, majority of existing policy mechanisms fail to recognize the critical importance of developing indigenous eco-innovation potentials. Faubert, (2012) on his part blames educators for not sufficiently responding to the need for sustainable development; where he claimed that most of their curriculum materials: units on energy, resources, environmental pollution and population growth, are peripheral, not central, to educational programs and ultimately they do not contribute much to a resolution of the planetary crisis.

In similar way, in Ethiopian it is argued that education has not contributed to the development efforts of Ethiopia to the desired level (Tekeste, 1996; Amare and Temechegn, 2002). Then, it follows that as development is dependent on environment and its resources, one could talk about

fragile contribution of education or environmental education to environmental understanding, care and sustainable development. In similar vein, the presently operating regional states of Ethiopia share and reflect these challenges.

Hence, I could argue that even though there has been consideration of environmental education aspects in the context of primary school subjects, implementing these intents appears challenging; and environmental crises are increasing instead of decreasing. Moreover, topics focusing on environmental education and related issues are sparsely studied (Aklilu, 2012; Damtew, 2008; Daniel, 2007; Melaku, 1994). Thus, this observation suggests the existence of the problem to be studied related to the integration of EE into school subjects. It is on this ground that the present study intends to examine the problem of integration of environmental education into Ethiopian primary school curriculum.

## **1.2. Statement of the Problem**

Currently environmental problems have been increasing and becoming complex, to which holistic approach of education is believed to bring change. Holistic nature is the characteristic of environmental education. Even though, environmental education is envisaged to be integrated into all school subjects in Ethiopia as a response to environmental problems, the way it is conceptualized, planned and taught is not supporting enough to proper understanding and protection of natural environment in addressing environmental problems. The Education policy action plan (ESDP-V) and K-12 curriculum framework evidently reflects this view.

It is proposed that (MoE, 2010, 2015) environmental education is included as one of the cross cutting issues into school curricula with the aim of raising public awareness and promoting understanding of the vital linkage between environment and development. The claim further illuminated the interdependence prevailing between sustainable socio-economic development and sound natural resource management, and environmental protection to be considered at all grade levels. In this regard the K-12 curriculum framework specifies that population and environment related contents such as rapid population growth, environmental degradation and resource conservation to be integrated into school subjects (MoE, 2010). Yet, the contents mentioned are not only limited in scope but also lack clarity and time frame to contribute to environmental understanding and protection.

However, it is apparent that when critically seen the ever increasing environmental problems both in magnitude and variety, and irreversibility of some of environmental degradation, (though environmental problems are attributable to diverse factors including natural on one hand and socio-economic variables like social beliefs, practices and economic needs on the other), inevitably one could think that the integration of environmental education elements into school curricula and teaching these components is not without problem. For me human attitudes and activities occupy the central place in causing environmental problems to which education about/in/for the environment is expected to bring resolutions to them if appropriately integrated into the school curriculum and implemented. In this sense, Kemp (2004) reminds us that environmental problems are unconceivable without human actions notably the nature and level of technological advancement of societies make the people the central actor in causing environmental problems. In the similar angle of claim it is also evident that the integration of environmental education contents and issues into all subjects of the primary schools and implementing according to EE goals intended and education about, in and for environment perspective is not as effective as expected. It is worth noting in this regard that school curriculum making in Ethiopia is decided at center and guided by K-12 curriculum framework.

However, studies (e.g. Damtew, 2008; Aklilu, 2012) revealed the prevalence of poor quality of Ethiopian secondary school curricular materials and little opportunity of integrating main environmental contents. After conducting content analysis of Biology subject curricular materials of secondary schools about integration of biodiversity and climate change topics, Aklilu (2012) found out that little integration of climate change related contents as compared to biodiversity related components. Further more, discipline oriented school subjects tend to emphasize knowledge (education about the environment) as compared to education in and for the environment. This condition does not imply consideration of real and local environmental experience as well as concern and caring behavior for environment.

Hence, I could claim that EE as currently planned and taught does not seem leading to proper understanding and meaningful practices in caring for and protecting the environment, and contributing to the environmental sustainability. Moreover, contrasting to the holistic and emerging nature of EE contents and issues, this problem can also be related to the level of integrating efforts in the teaching-learning process of environmental education components. The

problem can also partly explained by the increasing trends of environmental degradation and its severe consequences, and criticism made about education and EE about their meagre contribution to development and environmental improvement. Poor hygienic conditions noticed as improper waste material disposal (MOE, 2010; CSA, 2007), etc., being prevalent in numerous school compounds and their surroundings are indicators among others.

Available studies in the area are limited in number nationally when compared to international level. Yet of those conducted locally most emphasized the beliefs and experiences of society pertinent to environment and natural resource management issues practiced in different sectors notably agriculture and forestry. For example, Teshome Tafesse (2013) investigated Borena Oromo community environmental discourses through narratives and found out the dominant environmental beliefs and values manifested in the course of the discourses of different sorts such as environmental necessities and survival, scarcity and security, responsibilities ... etc. It was also noted that aspects of indigenous environmental knowledge sets such as season prediction, and awareness of environmental problems implied in the narratives. Within the same angle of discussion, Badege Bishaw (2001) focusing on the deforestation and land degradation in Ethiopian high land investigated agricultural and forestry practice and identified that social and policy issues like local participation in natural resource management and the need for clear land and tree tenure policies for long term sustainability and expansion of forest in Ethiopia. Similarly, Kassahun Embaye (2003) carried out study on ecological aspects and resource management of Bamboo forest in Ethiopia. The study disclosed the values that bamboo forest has to environment where it is argued that bamboo has excellent capacity in intercepting and converting solar energy into biomass and suits meeting goods and services needs which are essential for society and environment. The experimental study conducted by Getachew Tesfaye (2008) entitled "Ecology of Regeneration and Phenology of Seven indigenous Tree Species in a dry Tropical Afro montane Forest of Southern Ethiopia" also discovered among others, the socio-economic and ecological importance of the investigated indigenous tree species. These studies have empirical implication for the present study for illuminating the pro environmental knowledge and practical environmental experiences the society possess (Teshome, 2013; Badege, 2001) and special values of some plants species (Kassahun; Getachew) notably indigenous tree types to society and environmental protection. Though the cited research findings generated some valuable messages contributing to proper

environmental understanding and protection, the target community seems a few perhaps may be accessible to research community. This study differently focuses on the environmental education as means to convey environmental messages to the larger and diverse groups thereby to reach the public via school curriculum with the purpose of sound environmental understanding, care, and sustainable management of its natural resources.

Curriculum based approach is indispensable for environmental problems to be identified and (at least) minimized, given proper integration of environmental goals and learning areas or messages into school subjects. Then one could ask what is the state of environmental education components, and approaches of integrating into primary school curriculum in the eyes of the complex environmental problems prevailing and perpetuating ones.

On the other hand, studies made related to environmental education in Ethiopia are not only sparse but also confined to inquiry of issues of implementation. In this regard Melaku (1994) focusing on certificate level and Daniel (2007) on diploma level training examined how environmental learning is mainstreamed in teacher education curriculum. In similar ways, they reported the meagerness of foundational knowledge about the issues of environment among prospective teachers and lack of environmental skills. This suggests the prevalence of gap because environmental education is cross curricular and its contents are often emergent suggesting that integration also needs to be ongoing as learning process continues, and teachers, as first line agents need to be equipped well with necessary EE competencies. Similarly, curriculum related limitations (MoE, 2010) and methodological gaps (Aklilu, 2012; MoE, 2010) are also reported as constraints to the effort of environmental education practices.

With similar vein research results conducted out of Ethiopia which has both conceptual and empirical significance have been reviewed and used to guide the present study. Of these, a study made by Lydia, (2011) in Tanzania entitled integration of environmental education in the primary education was found to have conceptual and empirical importance to the present study and deserve reviewing. Integration of EE into primary education as a problem approached in Tanzanian context and the theoretical underpinnings used has a contrasting insight for my study in Ethiopian context. However, Lydia approached the reality of integration of EE into primary education mainly from teachers' views and experience; and found out that EE is not integrated in similar way into primary

school subjects and teachers disfavored integration of EE into all school subjects. Differently, my study sought to approach the problem basically from content analysis of curricular documents and triangulate with teachers' perception and practices. In addition to the visibility and context specificity of the problem under study, the holistic or interdisciplinary nature of EE urged me to see the integration both from textbook and syllabus (design aspects) and integration at teaching and localizing or indigenizing level, which was not considered by Lydia. Thus, more understandings about the integration of EE components into all primary school subjects, including the approach of integration employed, the missing element and other insights are hoped to emerge from this study.

Thus, practical experience and understanding emerged from the studies suggest the existence of gaps between the intended EE goals (e.g. proper understanding, caring for and protection of environment and its resources) and what is being practiced. The way EE is integrated and taught in holistic balanced-education about, in and for environment perspective is the issue awaiting investigation. Thereby, the progressively increasing environmental degradation in terms of soil loss, water and air pollution, vegetation or forest destruction among others are good indicators of the severity of environmental crises that urges us to employ educational approach different from what has been accustomed (though none of the studies view this dimension). This further suggests the inconsistency between environmental education approach and the current theoretical principles on environmental education. Thus, this study aims at exploring how EE is integrated and taught at primary school as intended; so that it could help learners understand and respond to the demands for environmental care and protection in the light of EE goals and policy.

### **1.3. Objectives of the Study**

The main purpose of this study was to explore how the Environmental Education components are integrated into primary school curricula and taught as perceived and practiced by curriculum experts and primary school teachers.

### **The Specific Objectives of the Study are:**

1. To explore the consistence between integration of EE components into primary school textbooks and actual teaching of EE contents at primary school
2. To investigate the extent to which EE contents that contribute to the development of environmental literacy and responsible behavior are integrated into primary school subjects.
3. To identify the approaches of integration of environmental education into the primary school subjects.
4. To explore the perception and understanding of primary school teachers about the integration of EE into the school subjects and their teaching.
5. To examine the teaching practices in the light of integration of EE components into primary school subjects.

Guided by the objective set this study attempted to answer the following questions.

#### **1.4. Research Questions:**

1. How is environmental education components integrated into primary school curriculum in Ethiopia?
  - 1.1. To what extent are the EE contents integrated into the primary school textbooks?
  - 1.2. What were the approaches followed to integrate environmental education components into the primary school subjects?
  - 1.3. How do curriculum experts and primary school teachers perceive the integration of EE contents into all the primary school subjects?
2. How is the integration of EE components in the teaching learning process practiced?
  - 2.1. How do primary schools teachers teach the EE contents in their subjects and

connect to local environmental experiences?

2.2. How are students supported in learning environmental education contents and issues in the primary schools?

2.3. How conducive are the situations for integrating EE components at teaching in primary schools?

### **1.5. Significance of the study**

Consistent to its purpose, this study is expected to bring some insight regarding the integration of environmental education into school curricula; perhaps issues related to environmental education curriculum structuring in the host subject. More importantly, it can bring into sight the gaps that prevailing between the intended policies, goals and principles of environmental education, and actual teaching-learning and its outcomes. Moreover, the study may suggest some innovative instructional approaches that suits EE as integrated components in all subjects. In this connection it is expected to enhance the awareness of the primary school teachers on the integration approach of environmental education into all school subjects and indicates ways for the improvement of the teaching and learning of EE as integrated component. Furthermore the study findings can benefit curriculum designers, educational decision makers and researchers by providing some important information related to the integration of EE into school curriculum and its teaching practices. It is also hoped that, some important understanding could emerged related the theory and practice of EE integration into school curricula.

### **1.6. Delimitation of the study**

The study intends to explore the status of integration of EE components into primary school curricula. In order to address this objective, the main sources of evidence for the study has been confined to primary school curricular materials (textbook, supplemented with syllabus), and participants (curriculum experts and teachers). Cognizant that integration at design and instruction level is a concern of curriculum experts and teachers, attempta have been made to get ideas of middle level educational officials (Curriculum Directorate head from Federal and curriculum team coordinator from the Region) for cross account and policy opinion. Furthermore, to include

teachers as sources of data, four primary schools were selected from Jimma Zone of Oromia Region as a case. The rationale for focusing on schools of this area is related to my interest in environmental studies due to my geography background. More importantly, the geographical location, landscape and bio-physical characteristics of the Zone attracted my attention. Jimma Zone [with Jimma Town as its capital] is located at about 353 kilometers to the South-West of Addis Ababa. It is one of the 20 Zones of Oromia regional state and part of the rainy and green areas of the country.

The Zone makes a part of the remains of South Western forest coverage part of Ethiopia, which at the same time is exposed to further fast depletion, (e.g. it is confirmed by some official documents that we are in late deforestation stage, Oromia Nation Regional State, 2011). Consequently combined with many other environment related concerns like the irreversibility of some environmental degradation and its consequences I bear in my mind, I was motivated to examine and understand how EE components were being integrated into primary school subjects and taught. The implications the natural and local environment could bring to the teaching-learning practice in general and environmental learning in particular was another force that won my interest toward the schools in the study site. Moreover, my research approach-a qualitative case study which requires an in-depth inquiry than extensive survey makes selection of the sites more meaningful. Hence, to concentrate and study in-depth, schools which were accessible in terms of infrastructure and those that somehow represent the environmental characteristics of the Zone described above were included. Conceptually, the study emphasizes the integration of EE contents and issues especially the natural dimension of the environmental components and local or indigenous experiences into the primary school subjects and teaching of those subjects.

### **1.7. Limitations of the study**

Similar to any research project in the human-behavioural sciences, this study had several limitations. It was felt that the degree of observation and types of participants involved in the study could have been considered differently. In-depth observation of the practices of the teaching-learning process of environmental contents into other subject, and including students' perception and efforts, would benefit if considered. Yet, the different data sources and tools of data gathering employed are hoped to minimize this and similar limitations. Another concern is the issue of generalizability of the finding inability to include top Federal level policy maker. In this regard,

since the study is a qualitative case study; its generalizability to the larger setting would be constrained. However, of the data source used syllabus and textbooks are provided with standard (e.g competency, content, time and etc. specified) to the regions and regions translated it to their language while maintaining the components and standards. Moreover, triangulating information obtained from curriculum experts and middle level (decision makers) officials could extend the effort of minimizing the weak side feared of and the findings of the study at least provide valuable implications to a considerable extent of settings. Moreover, as a reaction to the concerns felt, attempts have been made the talk with some state education minister decision makers. Accordingly, the Federal General Education *Deta (Vice)* Minister office was consulted. The consultant officer after hearing debriefing of the study problem, instances of findings and recommendation ascertained “the timeliness of the study and acceptability”. The discussion also showed the complying of the study findings with new Education and Training Road Map directions. Hence, inability to get the opinions of top official policy decision makers can not cause a significant limitation in this regard.

Subsequently, further inquiry can be carried out on the practices of environmentally integrated teaching and learning subjects at primary school focusing on teachers, students and community.

## **1.8. Outline of the Thesis**

The present study aimed to examine how EE component is integrated and taught in Ethiopian primary school curricula focusing on Jimma Zone of Oromia Region. It was organized into six chapters. This introductory chapter presents and describes the background of the study, problem definition, the purpose, and basic questions to be addressed among others. Chapter two and chapter three covered the theoretical underpinnings and subsequent conceptual framework and design and methods of the study respectively. Historical development of EE, emerged conceptualizations and debates, integration of EE into school curriculum, teaching EE components in all school subjects and conceptual framework have been discussed in chapter two. Similarly, chapter three comprised research design and details of procedures, data sources and gathering tools, data analysis strategies as well as research ethics and validation.

Following the three chapters cited above, the results have been organized and presented as part of fourth and fifth chapters. The result referring to the integration of EE components into primary

school textbooks and syllabi were analyzed and discussed in chapter four. Where as perceptions and teaching practices of primary teachers of EE components in their subjects is interpreted and discussed under chapter five. The final chapter six drew major findings, conclusion, conclusion and implication of the study.

## **1.9. Operationalization of Concepts**

Before getting out of this introductory chapter it is logical to introduce the intents and meanings some of the key concepts carry in this study. These include the following:

**Environment** may connote both living and non living constituent of the earth's sphere that includes humans. Particularly, in this study it refers to living and nonliving things which are naturally interdependent and important for sustaining life on the earth.

**Environmental Education** is a learning process that increases people's knowledge and understanding about the biophysical environment, human-environment relationships, related issues and challenges, and develop necessary skills (competencies) to address the challenges and foster attitudes, motivation and commitments to care for and protect the environment and make informed decisions and take responsible actions accordingly.

**Integration** in general may convey the idea of connectedness of different discipline areas or unification of diverse elements/contents of different subjects to form a cohesive whole. However, integration of environmental education into school curriculum is beyond the essence of interrelating or integrating discipline or subject matter contents. Integration in the EE context refers to interdisciplinary integration that involves incorporating and connecting EE contents as well as local experience and values into/with all school subjects as can be identified from textbooks and actual teaching. Moreover, it refers to fusing the EE elements in the environmental learning process of all primary school subjects that foster the attainment of environmental education goals. It also may refer to mainstreaming of EE topics and issues into the whole school curriculum.

Integration, fusing and mainstreaming both address curriculum components organization. However, slightly differ in emphasis and level of organization of the elements or components. For example regarding to curriculum integration we can talk about within single subject integration

where topic to topic, unit to unit, content to content as well as one day lesson to the next is connected (Fogarty (1991), identifies this as ranging from fragmented, connected to nested continuum of integration). The continuum continues to include across discipline integration and within and among students integration. The last notion explains that integration never end at curriculum design or instruction level but finalized in the learners mind. It means unifying different subjects topics and contents to create entire whole at curriculum level and meaningful whole in the students mind.

Fusing is about combing units and contents of subject matter from different field to visualize their interconnection. Mainstreaming can be understood as including or incorporating subject matter contents and issues into all school subjects.

## **Chapter 2: Theoretical Foundations for Environmental**

### **Education as Integrated into Primary School Education**

This study intends to explore the integration of environmental education into primary school curriculum and the learning process practiced. It is with this intention that, the following key concepts and theoretical underpinnings expected to guide the study are clarified. Accordingly, this chapter discusses the evolution and concept of Environment, Environmental Education (EE), Education for Sustainable Development (ESD), models of EE, environmental education and school curriculum, teacher preparedness and teaching-learning approaches of EE, and constraints facing teaching-learning efforts of EE.

#### **2.1. The Evolution and Concept of Environmental Education (EE) and related Terms**

##### **2.1.1. Evolution of EE-ESD**

As to when the term environmental education was first used, different theorists suggest different times. In Europe, arguably it is claimed that the term was “first used in Paris in 1948 by Thomas Pritchard at a meeting of the International Union for the Conservation of Nature and Natural Resource. In the same vein Wheeler, (1985) in Lydia, (2011) contends that environmental education was first appeared in the book entitled ‘Communitas’ by Paul and Percival Goodman published in 1947. In this connection, the work of Aldo Leopold cannot be forgotten; who published a book in 1949- ‘A Sand County Almanac’ in US which was acknowledged as a cornerstone of the American environmental movement and modern environmental thinking and writing (Palmer, 1998; Bodzin et al. 2010). Thus, even though the term could not be used as it is presently known, one thing cannot be denied, that those and similar moves/activities and efforts had served as layers or basis for later development of environmental education as a subject. However, many educational researchers indicated that environmental education as we know today had its root in the 1960s and early 1970s, and evolved by passing through several stages to take its present shape (Palmer, 1998:7; Stevenson, 2007:140). It is well known that as human socio-economic situation advances the coexistence of nature and natural entities and humans-nature relationship increasingly became disrupted. This is perhaps because of human centered perspectives (ignoring nature centered thinking) held and the consequent practical activities demonstrated through excessive and in-appropriate utilization of nature and natural resources.

Hence, as a result of humans' pressure and their threatening impact on the carrying capacity of the planet Earth, world people are forced to undergo global discourses; of which Environmental Education (EE) has emerged and developed as a tool to minimize or solve the environmental problems.

In effect, numerous international conferences had been held at different times and places generating and issuing environmental education policies, goals, principles and strategies to be implemented by diverse national governments of world countries. Among these conferences, the first was arranged in Stockholm in 1972, and continued to that of Belgrade in 1975, Tbilisi in, 1977, Rio de Janeiro in 1992, Thessaloniki in 1997, and Johannesburg in 2002, etc, (Palmer, 1998; and Stevenson, 2007). Throughout these entire forums there have been several variations of emphasis and ideologies undergone pertaining to environmental issues and environmental education. Interestingly, however, those conference arranged in Belgrade, 1975, Tbilisi, 1977 and Rio, 1992 are very important for setting basic concepts, goals and principles of environmental education and sustainable development. For example, as reported by Palmer, (1998), the final report of the Tbilisi Conference set out three 'goals of environmental education', clearly reflecting those identified at Belgrade. They are:

- a. To foster clear awareness of, and concern about, economic, social, political and ecological inter-dependence in urban and rural areas.
- b. To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment.
- c. To create new patterns of behavior of individuals, groups, and society as a whole, towards the environment (UNESCO, 1977 as cited in Palmer).

The overall implication of these goals revolve around the need for the adoption of educational program that can create environmentally informed citizenry, who makes responsible decisions pertaining to the dynamic interactions and interdependence between human being, cultural activities and nature. Because of devastating environmental conditions as caused by man's economic and innovative activities, the concern and commitment of international community's correspondingly expanded to incorporate environmental education and sustainable development policies in their respective national developmental agendas. It is revealed by theorists that out of

the United Nations Conference on Environment and Development staged in Rio de Janeiro (Brazil), during 3–14 June 1992; several important events have emerged:

Representing the beginning of a long process of interpreting, responding to and implementing recommendations and agreements designed to change the future of planet Earth; the focus of the Rio agreements is *Agenda 21*, a major action program setting out what nations should do to achieve sustainable development in the twenty-first century (Palmer, 1998:17)

Jickling et al. (2008), within the same angle of discussion, describe that through numerous conferences concerted during 1990s to 2000s efforts have been made to transform environmental education to education for sustainable development. In this connection there have been hot debates among environmental scholars and policy makers regarding the appropriateness of change of environmental education to education for sustainable development; and some claimed that EE has to examine the issues related to inequalities, North-South relationships, and sustainable use of resources and welcomed the move as a legitimate interpretation of EE. While others rejected the move, claiming that, in the 2002, United Nation's 57/254 Resolution, that declared a decade of education for sustainable development (2005-2014), (except recalling the 1992's conference outcome – environment and development), no a reference was made to environment or ecological issues. Moreover they suggested that, EE is well established field that already has examined the issues the ESD is supposed to examine (Jickling et al., 2008; Postma, 2006; Clover, 2000). Whatever the case may be, environmental problems and sustainability issues cannot be ignored because of the consequent risks and these are obviously among concerns of humans that need to be addressed by Environmental education.

Consistent with international trend, in Ethiopia, EE having its root in mid 1980s was introduced by the effort of Environmental Education Pilot Project (EEP) which aimed at training and orientation for educational practitioners (mainly teachers). It also involved students and farmers in environment and resource conservation practical activities such as tree planting, hillside terracing, constructing check dams etc. EE had also been given as a subject component of experimental pilot classes of General Polytechnic Education of lower primary for a while, which has terminated at tryout stage (Aklilu, 2012; Abera, 2004; Daniel, 2007). In more explicit way, the 1994 Ethiopian Education and Training Policy has given due attention to EE and sustainability issues to be incorporated in the curricula at different levels (TGE, 1994). It is also evident that as a basis of this

effort, environmental issues have been considered in the country's constitution and developmental policies (Aklilu, 2012). Yet, it is arguable that though, there is basis for integrating EE at policy level which I considered as theory (rhetoric) to what extent it is put in practice at school level and contributed to the improvement of environmental conditions.

Thus, recognizing the dynamism and the complex nature of this era, and progressively increasing environmental degradations, I could argue that while integrating international recommendations in one's national programs, such as issues of development, critically questioning the discrepancies in terms of local or context and/or global sense is very important. Next to this brief history of EE, the concepts of EE and related concepts as well as associated contentions will be highlighted.

### **2.1.2. Definition of Concepts**

**Environmental Education (EE):** It is imperative that defining terms in isolation does not provide clear meaning of concepts, unless we define related concepts and see their connections. Thus, after introducing EE, attempt will be made to define the term environment. Literature reveals that commonly accepted concepts and goals of EE at international level largely reflect the outcome of Tbilisi conference of 1977 (Palmer, 1998:135). For the sake of clarity, the meaning of environment is discussed in the next paragraphs, because it may influence the way participants understand, and adopt attitude toward the teaching of environmental education.

Environment may be perceived in many diverse ways by different people; but for the purpose of this study, I focus on a few observations. In this connection, according to Tani (2006) as cited in Lydia (2011:25) people's perception of the environment magnificently varies, in that identified three different ways how individuals view the environment. These include, environment as an *entity*, as an *experienced phenomenon*, and as a *socially/culturally produced phenomenon*. The following are summaries of the notion.

Environment when viewed *as an entity* may be taken as something which is not linked to man, but separate from man, understood the way we see the moon, the stars or the sun and considered as objects which are out there implying that the environment can be viewed objectively (objective view of environment). This entails further that knowledge about the environment can be obtained by scientific method/research. Environment *as experienced phenomenon* is understood as a space

which surrounds an individual, and the individual is at the center of that space. It can also be perceived as a setting for man's/woman's life; this represents the subjective view of environment for it provides the notion that man has control over the environment. Environment when perceived as *socially or culturally produced or constructed phenomenon*, in this view, man is viewed as an integral part of the environment and s/he shapes it through his/her social and cultural behavior. It also implies that knowledge about the environment depends on the understanding of man and his/her social and cultural aspects and not from the environment only.

As illuminated by the preceding discussion, the conception of the environment varies due to their contextual differences. It is argued in this sense that, environment exists as the moment one names it and gives it a meaning (Smyth 2006). The understanding emerged entails that environment is not an entity standing alone out there being cut from human beings and their cultural setting, but can be considered as phenomenon that humans are an integral part. In this regard environment should be conceptualized in totality, which refers to the quality or state of being total, whole or complete to include all the aspects of a given phenomenon. Therefore, environment in its totality includes all aspects surrounding man, which comprises the biophysical, social, economic and political aspects, (Palmer, 1998; Lydia, 2011; Kulnieks, et al. 2013:67).

Having the brief history of EE and the meaning of environment in mind, here my focus turns back to the concept of environmental education and sustainability issues. Accordingly, the definition emerged out of Tbilisi conference reveals that "EE is a learning process that increases peoples knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges and fosters attitudes, motivations, and commitments to make informed decisions and take responsible actions" (UNESCO, 1978 cited in Bartosh, 2003; Eulefeld, and Shaw, 1991:301). This definition is comprehensive and important for it emphasizes: educational purpose domains, learning process and learners' responsibility in order that learners are helped to understand the environment, their relationship with environment and resultant problems and then develop concern and action competency related to environmental issues.

Different authors also conceptualize EE in diverse ways. For example Steele, (2011:3) conceived EE as interdisciplinary area with diverse character both in content and pedagogy; having purposes of providing experience and knowledge necessary for caring for environments. EE is also

considered as a post-modern study of political, social, cultural, ethical, religious and philosophical issues as they pertain to humans in the environment (Hart, 2003). This conceptualization, I suppose, may convey some message such as EE is broad enough to accommodate all aspects of needs required by humans including EE-ESD related debates; this would be reflected on later.

Tilbury and Lee (1998) on their part understand EE as a discipline which ultimately aims to educate people to protect and improve the physical, as well as social environment. In the same line of argument, Kulnieks, by drawing on the 2007 Canadian education report-‘Shaping Our Future’, defined Environmental Education as education about the environment, and in the environment that promotes an understanding of rich and active experience in and an appreciation for the dynamic interactions of:

1. The Earth’s physical and biological systems
2. The dependency of our social and economic systems on those natural systems
3. The scientific and human dimensions of environmental issues
4. The positive and negative consequences both intended and unintended of the interactions between human-created and natural system.

These conceptions of EE suggest its cross disciplinary nature that needs to be fused in all areas of study and activity oriented learning both inside school and outdoor settings. In this vein, it claimed that (e.g. Orr 1992; Sauvé, 1996; Hart, 2003; Stevenson, 2007) EE characterizes complex and interdisciplinary nature, non-traditional pedagogies involving, its necessity for critical and place-based perspectives, and its social and political relevance. These all have at their core the goal of experiencing, learning about and caring for natural environments, including the plants, animals and people that inhabit them. Thus, as a central concept in this study environmental education is understood as learning process that enables individuals to become more knowledgeable about their environment, humans-environment interrelationship and to develop critical and rational thinking, responsible environmental behavior and action skills so that they can be concerned about, protect and improve the quality of the environment, thereby improve the quality of life on the earth (Kulnieks, 2013; Nordström, 2008, in Lydia, 2011; Steele, 2011).

While examining the concept of environmental education, education for sustainable development and its connection to EE cannot be left aside. Regarding the relationship of Environmental

Education (EE) and Education for Sustainable development (ESD) there has been controversial debates among environmental educators and researchers pertaining the emphasis and scope given to each. There are different positions held since 2002 (Johannesburg conference) when more emphasis was given to the language of “sustainable development” (Postma, 2006). Sustainable development has received impetus following the conferences held in Rio de Janeiro on Environment and Development in 1992 as well as that convened in Thessalonik on Environment and Society in 1997 (Katayama, 2009). Some consider the two as equal and use interchangeably, while others see each as different entity and take ESD as concept that replaced EE, while others still question and disregard the introduction of ESD. In this connection Katayama (2009:24), attempts to visualize the controversies involved in EE-ESD related issues drawn on the pattern anticipated by Hesselink et al. (2000) and Sterling (2003), where they have specified some possible patterns of interrelations between environmental education and education for sustainable development:

- a. EE is synonymous with ESD and ESD and EE partly overlap
- b. . ESD as a stage in the evolution of EE and ESD is a component of EE and
- c. EE is a better term than ESD and the latter should be done away with
- d. EE is a component of ESD and ESD is a better term than EE and the latter should be dropped... etc. (Hesselink et al., 2000 and Sterling, 2003, as cited in Katayama, 2009).

It is evident from these outlines that, these concepts are perceived and interrelated in many diverse ways by scholars. Cognizant of respecting meanings maintained by different concepts and terms of authors’ in the context of this study views pertinent to EE and ESD relationship deserve reflection. It is evident from the review that, those who support “EE as synonymous with ESD” would argue that EE has encompassed social and human orientations, in accordance with the Tbilisi Declaration (UNESCO-UNEP, 1978). Those who perceive “ESD as a component of EE”, consider ESD as narrower in scope than EE; for the latter can include: conservation education, outdoor education, pure environmental science and the like, which ESD may not accommodate. Finally for those who believe “EE is a component of ESD”; education for sustainable development has a wider boundary than environmental education because it includes more social and economic aspects in addition to environmental issues (Katayama, 2009:25; Yalçinkaya, 2013:216).

The emphasis given to ESD seems more focused since 2002, when UN General Assembly initiated “United Nations Decade of Education for Sustainable Development” (2005-2014), with the aims

to-“promote education as a basis for a more sustainable human society and to integrate sustainable development into education systems at all levels” (UNESCO, 2006) cited in Katamya, (2009). It appears that education is seen as crucial tool for sustainability of human being on the planet and their relationship with earth’s environment. In this connection, different authors have provided their observations. For example, Nevin (2008: 56) in Yalçinkaya (2013:216) describes that ESD’s primary concern is the improvement of the quality of life for people without damaging the environment. Likewise, Özdemir (2007: 25) in Canan (2011) contends for the establishment of a new perception aiming to reinforce sustainable living culture on the earth and focusing on the development of cognition, affection, skills and abilities in compliance with this perception.

In spite of different positions held about the relationship of EE and ESD, their goals do not seem contradictory on explicit term. Yet, it is also contended that beneath the aims of ESD, self directed (the empowered groups) benefit maximization that could be manifested in capital accumulation intentions seems inclosed. The contentions involved are exacerbated by the vagueness of the notion of sustainable development and this would be highlighted in the forthcoming discussion. In this study EE is used as an umbrella term to consider all the concerns and components mentioned which is a holistic approach. My justifications to use EE are two fold. First, it is often argued that the concept of ESD appears unclear and disputable because of the emergence of many competing terminologies such as education for sustainability (Taylor et al. 2003); environmental education for sustainable development (UNESCO, 2005); education for sustainable future (UNESCO, 1997) etc. cited in (Katayama, 2009). Similarly criticisms regarding root lessness of ESD (Jickling and Wals 2008; Postma, 2006) also a resean. In this angle Jickling and Wales, contend that: ESD is not readily acceptable; because, it is not only well established concept, but also it fails to enhance reflective and self determination about educational outcome, autonomous thinking and exploration of more contextual perspective towards a better world.

Bob Jickling particularly has been critical about the effort exerted to replace EE by ESD and argued that ESD is UN-preferred form of education, introduced with the intention of eliminating EE and to destruct people from the fundamental matters such as re (connecting) people with natural environment or world, and with each other...etc. Wals (2008), though differs from some of Jickling’s points of view related to EE-ESD controversies (e.g deliberate elimination of the idea

of EE), later on also critiqued the notion of sustainable development and questioned the character of ESD. He contended that ESD became a colonizing instrument as it was manifested in its early years when it was super imposed on countries and communities as the new ‘flavor of the day’. Similar contention was made by Robottom, (2007) and Cartea, (2005) in that they stressed the absence of any tangible justification for the transition of EE to ESD. Robottom states why “rebadging EE as ESD” is needed is remained unclear, while Cartea critically argued that there is no “logical, epistemological, methodological, or ideological ground” revealed to accept ESD as a better response to the socio-environmental crises than EE (p, 285). It is also illuminated that ESD is constrained by the idea of sustainable development because it tended to marginalize ecology or natural environment and remained conceptually flawed and internally inconsistent. Hence, the attempt of changing EE to ESD does not seem reasonable and progressive for it less regard the environment in its principle and there by obscures what have been achieved so far by EE.

Moreover it is argued against sustainable development as being imprecisely defined, elusive in concept and version (Tilbury, 2002). Surprisingly, along this angle magnifying the elusiveness of SD authors (e.g. Dobson, 1996) pointed out the prevalence of over 300 definitions of the term in the circulation. Likewise, Bhagwati, (2004:156) went to extent of perceiving the term as “any thing-you want-it-to-mean term, and remarked, even God does not know what SD means”.

It is also questioned for being conceptualized to maintain the economic status quo and current socio-economic structures. Paradoxically, the very structures that appear to have created our current ecological problems are seen as part of the solution (Rees, 1992). Rees further contended that our common future assumes that economic growth is the primary vehicle for resolving both poverty and issues of environmental sustainability. However, an expanded economic outcome supposed to enable the poor obtain an adequate share never happens. This is evident from the fact that economic growth in the past has not eradicated poverty, instead created a greater share for the rich. Rees also highly questions whether industrial production can be expanded without further degradation to the environment. These claims appear sound and deserve considering.

Environmental education has also been attacked by others ascribing it as a form of indoctrination, advocacy and mis-education from the right (Sanera and Shaw, 1999). It is criticised and questioned for more focusing on environment than human development (Mckeowns and Hopkin 2002),

characterized as works dominated by doom and gloom scenarios (Tilbury, email message, 2003). It is further perceived as stressing fear scenarios of environmental degradation and resource depletion (De Haan and Harenberg in Rein and Nikel, 2004) and supported the transition of EE to ESD as a consequent. It is apparent here that humans are isolated of their environment which suggests the interdependence of the natural environmental components are either less regarded or deliberately overlooked. Consequently for me the argument may not be sound enough as it is claimed. Since hiding what have been happened to planet earth (mostly by humans) can not be a remedy for the socio environmental problems confronting us.

Of authors advocating for ESD, Summers et al., (2003) put out that it unites or attempts to unite social, economic and environmental factors, of course without neglecting limitations of sustainable development or education for sustainable development. In a similar line of argument, Postma(2006) from his analysis of research results concluded that, currently the notion of *development* appear to be perceived in terms of *capitalist market economy* narratives which is interpreted as *economic growth* and its guiding motives of profit maximization and capital accumulation. Surprisingly, this interpretation is supported by sustainability principles generated by UNESCO-International Conferences of Rio Summit of 1992-issued Declaration on Environment and Development and that of Johannesburg conference of 2002, which produced ESD toolkit. For example one of these principles says “Nations should cooperate to promote an *open international economic system* that will lead to economic growth and sustainable development in all countries; where ESD is required to promote creative and effective use of *human potential and all forms of capital* to ensure rapid and more equitable economic growth with minimal impact on the environment (UNESCO, 1992).

If we critically examined the foregone arguments they revolve around the human-natural environment issues and some tend to confuse the relationship existing between them and artificially attempt to separate one from the other. In reality, however, human conditions and environmental conditions are highly interconnected. Human survival and economic growth are dependent on energy and material resources obtained from natural ecosystems (Rees, 1992). Focusing on either of humans or environmental matters does not suit the question of sustainability; rather a balanced perspective and practical effort appear essential to attain sound environmental and societal sustainability. I could argue to end that neglecting the prevalence of the critical

environmental problems cannot avoid the experienced ones or prevent the new from happening but conscious effort and transformed way of thinking and acting while dealing with our natural environment and using its resource deserve attention. This can be served by education preferably EE than ESD for the latter does not seem educational in intention and essence.

On the other hand, it is EE that is recognized and stipulated in Ethiopian Education and Training policy and strategy statements. In conclusion, cognizant of all these arguments, though the core emphases of sustainable development language appear economic or development oriented in character, (which most probably puts the wealthy nations on the advantageous side), and it seems logical to be reflective and pragmatic while considering and conceptualizing these definitions and debates reviewed. Here sustainable development is considered as emerging aspect of environmental education. In the next sections environmental education as components of school curriculum and associated views will be discussed.

## **2.2. Environmental Education and School Curriculum**

The issue of incorporating EE in all levels of educational systems has its strong base in international community consensus and consistent national commitment. Integrating EE into school curriculum urges us to think about the essence of curriculum. In this sense, curriculum can be conceptualized many different ways, accordingly for Palmer (1998:143) in the context of EE, curriculum, encompasses plan for program of study, integrated topics, subject-based curricula, and tasks applicable to diverse students. It refers to all the experiences that students develops to help them understand environment, develop skills, attitude and action necessary for environmental protection and proper use and management of natural resources. It also includes ‘experiences of problem-solving, decision-making and participation, with considerations based on ecological, political, economic, social, aesthetic and ethical aspects. Furthermore, it is meant about promoting changes in attitudes and behavior that will help to solve existing problems relating to the environment and to avoid the generation/creation of more new ones.

Likewise, Reinhartz and Beach (1997:20) perceive curriculum as a blue print for learning or planned experience and process but flexible enough to meet the needs of individual students while taking into consideration unplanned opportunities, teachable moments. These conceptualizations of curriculum appear crucial both for curriculum designers and teachers for they remind us how we

should be flexible related to the emerging nature of EE components and its teaching and learning process.

Pertinent to environmental education curricular structure, educational methods and practices, literature reveals ongoing arguments about emerging world view (paradigm). Environmental scholars (Gough, 1987; Palmer, 1998; Capra, 2007) argued for desirability of shifting from materialistic or atomistic world view and epistemological paradigm (that dominates formal education and still continues to influence) to ecological paradigm for education.

They further (e.g. Capra, 2007) warn us to examine the underlying structures and paradigms of education from time to time with a view to reconstruction and indeed that our present system of education has been built up on understanding of reality, nature, and human nature that can no longer be taken for granted. In this line of discourse, it is also contended that though, materialistic (positivist) world view continues to dominate formal education, there is observable movement towards the strengthening of ecological, humane and spiritual values and away from scientific materialism in western society, coupled with parallel shift from this western materialism toward reassertions of native cultural values and beliefs in developing countries, (Herman, 1985 in Palmer, 1998). On this point it is recommendable to capitalize on one feature of the changing world view-i.e. holistic (rather than fragmented) and encourage paradigm shift toward ecological world view. Rooted in the work of Emery (1981) (human perception studies) ecological theories explain that, “we can access *information* that are present in our *personal, social* and *physical* environments through an education of the senses” (Emery, 1981). It is also argued that (Palmer, 1998; Sterling, 2003) ecological world view emphasizes a learning process within our environment that involves searching with our own perceptual systems, rather than relying on traditional-transmission model of teaching. Holistic approach in education is varyingly accepted through time. In this regard theoretists (e.g. Kysilka, 1998; Fogarty, 1991) illuminate how integrated curriculum designed is favoured. They explicated that curriculum integration can be understood in terms of curriculum continuum that range from traditional discipline based objective driven to internet based student exploration models.

Integrated curriculum is perceived important to 21<sup>st</sup> Century situations for it allows pulling insights and skills from different disciplines against the complex and dynamic problems

confronting people. In addition to this, it is also contended that integrated curriculum contributes to students' meaningful learning through purposeful activities directly connected to students' interest, needs and experience. Human brain also is claimed to process holistic experiences and remember quickly and easily. Then, it seems unfair to pass to the deal of EE integration approach without linking it to the curriculum development trends shortly. Accordingly, theoretically it is claimed that three curriculum development perspectives have been identified namely the technical, practical and the critical models or approaches (Carr and Kemis, 1986; Stevenson, 1993; MCKernan, 2008). The integrating components of EE (about, in and for) can be related to the technical, practical and critical perspectives of curriculum. This will be discussed after the approach of EE integration dealt with.

### **2.2.1. Integrated Environmental Education Model and Related Concepts**

In the environmental education literature there has been different models guiding the study in the area. Of such theories, linear model type that is used for analyzing pro-environmental behaviors (Anja and Agyeman, 2002) can be mentioned. It is asserted that these models (rationalist) assume that teaching people about environmental issues and problem would directly produce pro-environmental behavior. Barr and Gilg (2007), strengthening this idea, explain that current policy discourses pertaining to environment focus around linear models of behavior which are based on the assumption that creating awareness about environmental problems and knowledge of how to tackle them will produce individual improved action.

On the other hand, linear models of environmental studies are criticized for being old and simplistic approach, where authors (e.g. Anja and Agyeman) based on literature idea, contended that in most cases increase in knowledge and awareness about environmental problems did not lead to creation of pro-environmental behavior. In spite of these critiques, still such simple model is used by some environmental Non-governmental organizations and even government for pursuing their communication campaigns and strategies on the simplistic assumption that more knowledge will lead to more enlightened behavior. The impressions from this analysis suggest that though this model may serve limited purpose perhaps when the focus is on knowledge aspect and discipline based, dependence on information for behavior change (pro environmental action taking) seems unjustifiable. Hence, I could argue that at present as the environmental problems and issues become complex and dynamic, the traditional linear way of thinking may not be

adequate enough to guide environmental inquiries. Instead Franzie L. Loepf's (1999) view of holistic or integrated models are recommendable; particularly for primary level learners this approach seems developmentally appropriate and relevant. Among many environmental education authors supporting this view, Capra (2007) contends that since living systems are nonlinear and based on pattern of relationship and interdependence, understanding the principles of ecology requires new ways of seeing the world and thinking in terms of relationships, connectedness and context.

In this regard, consistent to ecological perspective, EE owing to its cross-disciplinary and holistic nature, integrated model is more advocated for EE studies these days by many authors such as Chambers, (1991); Tilbury, (1996); Gough, (1997); Palmer, (1998); and Capra, (2007). For example, Chambers has illuminated that EE has been recognized as comprising three components in terms of integrating environmental learning. These include education about the environment (Knowledge), education for the environment (values, attitude, and action) and education in the environment (a resource). However, Chambers conception about these reinforcing each other's learning domains appear problematic in two ways. One, considering education *in* the environment component, environment only as learning medium does not seem sufficient; because it also serves as stage (setting) of learning, where real experiencing or opportunity to practice occurs. On the other hand, nothing is said about the relation of these components and learning process and how they operate. Similarly, Capra has also attempted to explore and develop concepts and practice for cultivating in children the competencies of mind, hands, and heart to help them create sustainable communities. The focus of this inquiry was facilitating understanding of nature's principles and fostering a deep respect for living nature through an experiential, participatory and multi-disciplinary approach. The approach that palmer refocused deserves consideration in this regard.

### **Integrating Components or Threads**

Palmer's model sharing the preceding views claims that for EE to be accepted and meaningful, it should include three interrelated components, namely: education about, education in/through and education for the environment (Palmer, 1998:137). In this connection it is worth noting that model is incorporated in the book written by Palmer, (1998) named Environmental Education in the 21<sup>st</sup> Century focusing on theory, practice, progress, and promise where she asks what is happening in

the young, but dynamic and complex field of environmental education. The book served as theoretical foundation for this study whereby, of the five major issues covered by the book, subject knowledge of EE under which major issues affecting the earth today, development and environment, analysis of environmental problems, priority solution, and analysis of realm of educational practices, illuminating EE integrated model (Education about, in and for the environment).

Moreover, the model also encloses curricular elements and learning process within the framework implying the focusing area of one's inquiry. Hence the present study mainly is grounded in Palmer's (1998:144) integrated model of environmental education at the same time; ideas are borrowed from other researchers' work, and local experiences for further conceptualization and to establish a modified integrative model.

The model is selected as a guiding theory for the present study because it is consistent with my perspective- belief on existence of multiple realities, particularly the constructivists' view that is accepted as a reference. Moreover, the interdisciplinary nature of the model appears consistent to the cross-cutting strategy (MoE, 2010) of Ethiopian environmental education program, hence appropriate to Ethiopian context. In the next section brief discussion about these three integrating components will be made.

**a) Environmental Education as Education about the Environment:**

This environmental education as education about environment characterizes traditional (objective) view. This dimension seeks to discover the nature of environment through investigatory approach; the emphasized objective is chiefly cognitive (Palmer, 1998:137). Here environment is considered as a subject of investigation, and focuses on the development of knowledge about the environment, environmental issues and problems, there by stress the development of appropriate technical and intellectual skills to address environmental problems. It is believed that, this view was developed at the beginning of environmental education movements, when the main focus was on knowledge development and understanding about the environment and creating environmental awareness among people (Gough, 1997; Tilbury, 1996). The underlying assumption of this outlook is that developing understanding of the environment in people could stimulate action taking for solving

environmental problems as well as preventing further environmental degradation in their surrounding (Gough, 1997; Palmer, 1998).

Hence, in this sense teaching of EE involves transmission of knowledge about the environment and environmental problems. Similarly, topics in the school curriculum (according to this view) includes issues about the physical environment, various interventions (activities) as causes of environmental problems and the nature of different environmental problems. Thus, related to the influence of discipline based structure of curriculum in Ethiopian school curricula this view seems predominant. However, the question is stressing on knowledge and understanding lead to taking pro environmental action and solving environmental problems? This is one of the area, I feel, meagerly depicted by the author, it should be implied beyond mere transmission of informational knowledge, if the present situation of environmental problems is to be reversed.

#### **b) Environmental Education as Education In the Environment**

Environmental Education as education in (from or through) environment is considered as general education for children or learners that uses environment. Here, environment has two purposes: first, as resource or materials facilitating understanding and serving as medium of realistic activities for inquiry; second, beyond serving as realistic stage of learning, it enhances learning how to teach (Palmer, 1998).

It is argued that this approach was developed after awareness grew that transmitting knowledge about the environment is not enough as people did not take action on environmental degradation as had been assumed. This view represents a wider interpretation of the environmental crisis that needs to be learnt about, through real life experience (Palmer, 1998). Education through or in environment entails the need to focus on experiences in the environment where learning involves hands-on activities such as making observations of their surroundings and learning through field studies, hence can enhance deep learning and can be used in many subjects such as language, mathematics and others incorporating environmental education and sustainable components.

Relatively this view shows directions to participatory learning from the environment, based on direct experience. But it is argued that this perspective less applied in practice as compared to education about the environment. In this regard even though there have been efforts to make learning, experience based by relating the classroom instruction to real life experience at least in

lower primary schools of Ethiopia, these principles do not seem fully employed in our education systems .

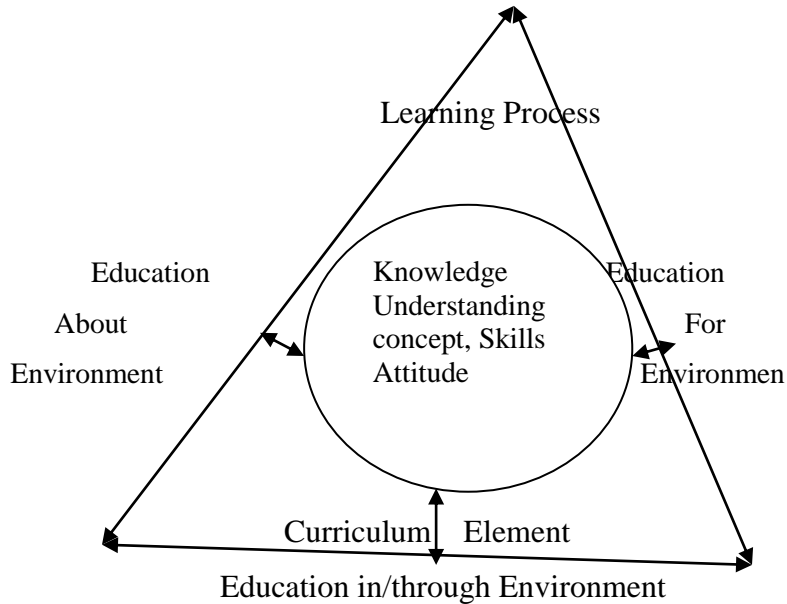
### **c) Environmental Education as Education for Environment**

It seems that the principles implied by education about and in or through environment alone and in isolation are not enough to make EE learning meaningful. Thus, education for environment need be considered along these dimensions. According to Palmer (1998), education *for* the environment is education which is environmental in style with emphasis on developing an informed concern for the environment. It is also claimed that, the purposes of education for the environment go beyond knowledge and skills attainment and also aims at the development of involvement and molding values which affect behavior. This view importantly focuses on the development of environmental understanding, attitude and environmental concern that means educating pupils so that they can take positive action individually or collectively for the benefit of earthly environment (Schools' Council, 1974; in Palmer, 1998). It is evident at same time that, though neglected so far, it seems that attention is being given to education for the environment currently with parallel shift of focus an ecological paradigm in education.

On the other hand education for environment is seen as developing action competence in the learners; action competence here may mean "pupil's abilities to act at the personal and societal level" (Jensen, 1995:6, in Lydia, 2011:29). The authors also expressed that education for environment "promote ... critical reflection ... lifestyle changes that are more compatible with sustainability" (ibid). Education for environment aspires to "Empower people and provide learners with skills to take positive action so that current and future generations have a critical thinking and understanding of how complex systems, such as environments and ecosystems, economic and socio-political systems, work" (Tilbury and Cooke, 2005). The three integrating components education about, in/through and for environment while expected to operate together they suggest stages of learning perhaps moving from awareness-to skill or activities-and to pro-environmental value development. However, the rampant environmental problems witnessed these days at different setting, appear contradictory to this model's principles. The reason could be probably failure to back our educational system by insights emerging from research findings.

Contrastingly, different hierarchy (Jeronen and Kaikkonen 2002, in Reid, J-A, 2007) is proposed for successful environmental education. This moves from ‘sensitivity’ to ‘awareness’, to ‘knowledge’ and, finally, ‘action’ on the part of both teachers and students. The authors also explicated that while these ‘outcomes’ of environmental education may be listed cumulatively in this hierarchical account, they are also all-encompassing and additive, in that teaching and learning activity in, on and for the local environment necessarily involves, incorporates and reproduces concern(sensitivity), awareness, and knowledge in ‘rich’ and ‘productive’ pedagogical practices. Of course Jeronen and his partners’ explanation appear unclear particularly the, ‘in, on, for’ component was not clearly defined. So these different narrations inevitably force us to pose questions about how to structure EE curriculum and lead the corresponding teaching-learning processes, the emerging analysis and discussion is expected to ponder to the point.

In this regard it worth noting that Palmer’s suggestion that urges three integrating thread of EE: education about, in/through, and for the environment to be recognized together while organizing or structuring environmental education components in other subjects of the school curriculum; including the question of maintaining the balance of emphasis given to them. As a matter of fact, so far the emphases given to the three components vary tremendously. Education about the environment has been focused to a great extent, while education in/through the environment considered to the lesser degree (Tilbury, 1995; Gunnell and Dyer, 1993 in Amy, 2011) but education for environment appears neglected. As implied from the discussions made, the emphasis given to knowledge learning about the environment and its problems is based on the assumption that knowledge gaining can lead to attitude and skill development and values. However, this situation resulted in overlooking of concern and ethics toward the environment that require education for the environment approach; implying that, those assumptions do not seem working. Figure 1 below represents Palmer’s integrated model of EE components that can be used to structure EE into school curriculum.



**Fig. 1** Integrated model of Environmental Education (cited in Palmer, 1998, p.144)

From the figure, it is clear that the three components of EE outlined by Palmer above are interconnected and supplement one another to explain EE nature, planning and implementation. Palmer further underscored that at teaching-learning level experience, concern and action must be added to those elements outlined in the heart of the model. Lydia, (2011:29) adapting Palmer's model considers the components as stages of implementing environmental education. Learning about the environment is seen as the initial stage, which involves developing knowledge about the environment. While the second level learning in or from or through environment involves interaction with the environment to develop a deep understanding of the environment through experience or inquiry or resource. The third stage of learning for the environment is about developing value toward the environment and associated dimensions; in particular this stage comes after getting knowledge and understanding of the environment to value and take deliberate and responsible action to sustain it.

From my experience and readings I noticed that the Palmer's environmental education model if supplemented by ideas from other researchers of EE and/or curriculum can bridge the EE and sustainability related rhetoric- practice gaps. In this vein, in addition to the cognitive elements suggested in the model, the ideas of sensibility to nature, environmentally responsible behavior, and environmental ethics appear important component to be considered. With this intention, the

ideas of some authors are highlighted for more clarification of these concepts and issues which I think are either less regarded or lacking from the model mentioned.

#### **2.2.1.1. Humans Sense of Place**

Butz and Eyles (1997) introduced the notion of “sense of place” and dealt with from social, ideological and ecological dimensions. After reviewing research works, they found that “ecological dimensions of senses of place emerged from accumulated sets of perceived/known ecological affordances/ provisions. Ecological senses of place are the knowledge of a place's ecological characteristics that yield meanings which make persons identity with the place (Butz and Eyles). Place is different from landscape, for the latter is part of any part of the world we immediately encounter, and our conception and feeling remain temporary as determined by that encounter. Place on the other is constructed in our memories and affections through repeated experiences and complex associations. It is where one is known and knows others and involves sense of being; consequently humans make special attachment to the place where they live, repeatedly experience and make meaning out of that experience (e.g. one's feeling about home place, or origin).

Among the justifications cited for the development of such strong feeling, one entails that places are profound centre of existence and basis of identities and grounds of other dimensions (ibid). Based on this insight one could ask himself or herself that given this natural/inherent positive feeling of places, why do people cause a damaging impact on the environment? Inevitably, this view can safely be related to education for the environment view which seems neglected as contrasted to education about environment as indicated in the model above. Perhaps this ‘sense of place’ which seems strong internal feeling about ones environment can be used for teaching environmental concepts, issues and problems to primary school children as foundation if considered.

Similarly, Stevenson (2011) focusing on Australian context, has attempted to examine how the sense of place is conceptualized in EE studies. Stevenson described “A place is above all a territory of meanings... created both by what one receives from and by what one gives to a particular environmental context. A sense of place in environmental psychology literature embraces three interrelated concepts of place: place attachment, place identity and place dependence. Place attachment has been understood as “the positive cognitive and affective bond

that develops between individuals and their environment” (Altman and Low, 1992; Chamlee-Wright and Storr, 2009:617) in Stevenson, 2011: 51). Place identity, is viewed as individual’s self-identity and includes those dimensions of self that define the individual’s personal identity in relation to the physical environment by means of a complex pattern of conscious and unconscious ideas, belief, preference, feeling, values, goals and behavioral tendencies and skills relevant to this environment (Proshansky, 1978:155, *ibid* ). Place dependence is described as ‘an individual’s perception of extent of satisfying his/her needs and desires in a particular place compared to alternative places (Stevenson, 2011). So in short, these concepts represent belongingness and conception of interconnection between persons and their environment as shaped by repeated encounter or lived experience.

Differently, it is also argued that the relationship of humans with place/ environment appear dynamic or fluid, and individuals can hold multiple place attachment, identities or dependencies (Stevenson, 2008); and still others relating this idea to globalization contend that, globalization’s impact could urge us consider people as “placelessness” (Gruenewald, 2003; Gruenewald and Smith, 2008). According to these authors this is because people feel disconnected from places for they no longer inhabit them but simply reside in them influenced by communication opportunities of these days. To this end, though some feel that innovation related to information technology tend to shrink the planet (earth) and minimize distance or spaces, I think this cannot detach humans from nature or environment for our survival is dependent on the earth’s as our home and environmental resources.

Here as it is sensed from experience and observed from empirical evidences cited, the concept and view of a sense of place deserves attention related to environmental learning. Despite the prevalence of different positions related to humans sense of place, this inherent feeling of people about their particular environment or place if considered and build on while integrating EE into school curricula could contribute to the development of environmentally literate and responsible citizen who can care for and protect the environment.

#### **2.2.1.2. Environmental Ethics**

Both modern and traditional environmental ethics are expected to contribute to the development of environmentally responsible behavior. It is undeniable that environmental crisis is linked to the

way humans think and act. Hence, human thinking and behavior modification require considering environmental ethics into the EE conceptual framework. Environmental ethics generates issues, principles and guidelines related to humans' interaction with their environment. The impact of human--centric thinking (Anthropocentric Worldview) contrasted to earth-centric (Eco-centric Worldview) (Kaushik and Kaushik, 2004; Bernard in King-Tak 2009, p: 3) can be counteracted by incorporating environmental ethics into environmental learning. Bernard in King-Tak (2009) argued partly supporting human centric view where he states that 'all our values concerns and attitudes are necessarily directed to human interests'. The same author differently asserted that 'while human beings are beings of and within nature, they also signify the part where nature opens its eyes and gains consciousness of itself'. This notion has been given poetic expression as it was in Von Goeth's statement: "Nature is without language and speech but creates tongues and hearts by which she feels and talks" (King-Tak, 2009). Similarly, Taback and Ramanan (2014: XIII), while illuminating the need for learning ethical values at earlier in life, asserted that: "Earth provides enough to satisfy every man's needs but not every man's greed." Extreme greed, whether for money or nature's resources, has disastrous consequences.

From the preceding discussions, we can conclude that environmental ethics and values have to be integrated in EE if proper understanding, responsible and care based human relationship with nature and among humans is to be maintained. Sauve (1999:24) supports this view drawing on the issues of EE and ESD indicated the importance of ethics of responsibility toward one of the fundamental issues in the current crisis, namely the rupture between human being and nature; which is conceived as being manifested in three ways: crises related to relation between humans, relations within and between societies, and relation between humans and nature. The rupture/crack created between humans and nature due to thinking held and action exerted by humans seems major crisis that stimulates more other crises, and it shall be reversed through EE that integrates environmental ethical values. Moreover, the impression emerging from the preceding discussions suggests that if human beings ignore respecting and caring for nature it can take care for its self perhaps which may lead to disastrous effects/ends.

The human centric or anthropocentric view emphasizes the exploitation of nature through technological innovations, economic growth and development with little or no bothering and caring for the environment (cause of environmental degradation and human-nature relationship

crises). In contrast, the eco-centric or earth centric thinking urges us to live on this earth (nature) in harmony (Sauve, 1999) as a part of nature in responsible way, like any other creation of nature and live sustainably. As a result, it is apparent from this that one's feeling and thinking can influence his or her action. Consequently, in order to develop responsible behavior, sound environment and better future, we need to transform our feelings, thinking and attitudes by being sensitive and empathetic to nature; this holds true for learners through learning experience of their environment. In this context, it is worth noting that the modern environmental ethics makes sense when it considers the local or the indigenous environmental ethics and information.

Authors in EE area (e.g. Riitta, 1998), extends the argument to environmentally responsible behavior. Like Palmer, Riitta (1998) advocated for holistic approach to EE and used the concept of an "Environmentally Responsible Citizen"; but did not refer to the three organizing threads (education about, in, for environment) mentioned by Palmer. For Riitta an environmentally responsible citizen understands himself/herself as only one of the organisms in the complex and susceptible ecosystem, and that the human being belongs to the earth. Environmental responsibility encompasses the following features: pro-environmental values and attitudes, a sensitivity to the environment, an ecological consciousness, an in-depth knowledge of environmental issues, an ability to reflect environmental issues, a commitment to prevent and solve environmental problems, an action competence to solve environmental problems, and pro-environmental actions. She further goes on elaborating that "Environmental responsibility means to possess a mental image of oneself as an important actor in the prevention and generating solution for environmental problems.

Riitta identified a number of variables that are associated to responsible environmental behavior from research review. Accordingly, she found out environmentally responsible behavior is associated with components such as personality factors (attitudes, locus of control, efficacy perception, personal responsibility), knowledge of issues, knowledge of action strategies and action skills, intention to act, and situational factors (constraints and opportunities).

For Riittam, (1998) an environmentally responsible behavior is further linked to both a *concern* for the environment and a general *knowledge* of environmental issues. More specifically, her observation revealed that environmental ethics determines responsible environmental behavior tht

involves having respect for nature, all species and respecting future generations as one important element of environmentally responsible behavior. In this vein, it can be contended that the increasingly emerging and complex environmental problems can only be resolved if the inherent ties and interdependence between humans and nature or earth could be properly understood and respected.

The following assertion may further clarify the previous view point:

Homo sapiens are not any more conqueror of the land— he or she is a plain member and citizen of it. Our moral love and respect for nature is based on our aesthetic appreciation of nature, and it is an intrinsic part of human nature. We can be alienated from it in our high-tech society but, in our psyche, there is a reflection of missing nature and our psychological enjoyment of nature. We deal permanently with nature through our intense experience of heart, body and soul. Practically, we cannot live one day without connection to *air, water and the nourishment we get from the soil*; we learn to respect the earth as mother who gives human beings life, the fruit of abundance and serenity (Riitta, 1998:68).

This claim clarifies that humans do not have alternative rather than understanding the value of the environment, respecting and taking care for and making responsible decision regarding human-environment relationship. Desinger (1990) seems supportive to Riitta's ideas, and he found out (from an inquiry carried out in USA) that goals of many school-based environmental education programs include the development of knowledge, skills, positive attitudes, and motivation to take action toward the prevention and resolution of environmental problems. For Desinger, individuals who exhibit responsible behavior on a broad range of environmental problems have the following attributes: 1. Knowledge of relevant environmental concepts; 2. Knowledge of environmental problems and issues; 3. Concern for the quality of the environment; 4. Knowledge of action strategies that may be used for resolving an issue; 5. Belief that their action can make a difference; 6. Commitment to take action; and 7. Experience in action-based activities (p.33). Therefore, in order to respond to the environmental problems educationally, first learners should get opportunity and be assisted to develop deep understanding and responsible action skills regarding environmental issues and problems. The question is to what extent our EE program is conscious of these intents and demonstrating endeavor to achieve them.

The preceding discussion suggests that for not leading to our own destruction because of our activities and impact on the environment there is urgency to understand, love, respect and protect

nature or the earth today more than ever before. In the Ethiopian context, it seems that knowledge aspect (education about environment), has been emphasised in EE strategies (e.g. awareness developing is considered in ESDP-IV, MoE, 2010). Whereas education in/through and for seem to have been denied equal attention as can be judged from the prevailing environmental problems and corresponding concerns expected. Consequently, from the review of literature I learned that as the domain of EE elements such as *understanding, values-concern, and action competence, sensitivity to nature/environment, environmental ethics* appear significant to be conceptualized and considered while integrating EE in to primary school curriculum.

### **2.2.2. Integration of Environmental Education into School Curriculum**

These subsection overviews the curriculum development views prevailing and the essence and purpose of integrated curriculum related to EE.

#### **2.2.2.1. Curriculum Development perspectives**

The issue of incorporating EE into school curriculum inevitably is related to the concept of curriculum development. In its broader sense, curriculum development is ongoing process that comprises curriculum designing, planning, implementation, and evaluation activities. Various authors in the field of curriculum indicate that there are different perspectives of curriculum development (Elizabeth, 1990; Ornstein and Hunkin, 1998; Lydia, 2011). From review of the accessible literature it is found that there are three curriculum development conceptual perspectives, which include: traditionalism, conceptual-empiricism, and reconceptualism (Elizabeth, 1990; Ornstein and Hunkin, 1998). Carr and Kemis (1986), and Stevenson (1993) as cited in Lydia (2011), and Mckernan (2008) in similar way identified models parallel to these: technical, practical and critical curriculum models. Technical or traditional curriculum perspective root can be traced back to early 20<sup>th</sup> century (around 1920s) when curriculum became independent field. It is understood as a "technical rationality that embraced the tenets of an emerging scientism and the bureaucratic model" and a view shaped by the dominant intellectual paradigms of that period (Pinar, 1981:88). The common view of the proponents of this perspective and what connects them is an interest in the operation of the schools and the "efficient transmission of functional knowledge" (Giroux et al., 1981:14).

Technical curriculum model was found to focus on subject contents and over emphasized knowledge component (Tilbury, 1994; Robottom and Hart, 1993; McNeil, 1990). McNeil viewed this model as transmission model and expressed its curriculum organization mode as subject/discipline based and thus fragmented. Mckernan (2008) convincingly explains technical model as managerial style of ends-means rational planning by instructional behavioural objectives and has been began since the early years of 20<sup>th</sup> century in USA with the works of Franklin Bobbitt and more propounded by the teachings and work of Rulf Tyler. Likewise, Palmer (1998:145) related this to the positivist view of EE, and tends to see its purpose as learning ‘about the environment’, with externally imposed, taken-as-read goals.

The traditional or technical (positivist) perspective, as can be understood from the assertions above, focuses on objective: end (objectives)-means (contents) and employs scientific principles (technical know-how and steps) and top-down curriculum construction approach with emphasis on purpose of learning or knowledge about the environment. Moreover this orientation characterizes transmitting observable and measurable information (‘behaviorist reductionist principle-Ornstein and Hunkins, 1998) or efficiently imparting factual knowledge from teacher to students. Therefore traditional or technical model is linked to education about environment where the emphasis is on knowledge regarding environmental issues and human-environment relationships.

Conceptual-empiricists have emerged following the curriculum movement of the mid 20<sup>th</sup> Century (around 1960s) which attracted influential scholars from other disciplines, such as psychology, mathematics, and the sciences. According to Elizabeth (1990), the work of this group is believed to generate an interest in studying and building a set of theories about education (though in an unambiguous language) and processes in curriculum and instruction. This group’s interest partly lies in value-free investigations and models of logic based on the physical sciences, a view of schooling as system within which policy decisions are made about curricular aims. Moreover most of the conceptual empiricists also emphasize content-based theories, for many of them are advocates of cognitive psychology (Johnson, 1967; Walker, 1973 in Elizabeth, 1990; Ornstein and Hunkins, 1998). Furthermore it is claimed that conceptual empiricists have engaged in (Ornstein and Hunkins) substantive theorizing that involves analyzing current situations and suggest alternatives to current pattern of content and experiences that comprise most curricula.

It is further asserted (Mckernan, 2008) that the practical view emerged as curriculum development sought to emphasize a social and cultural practice and modes of deliberation and practical reasons. According to Mckernan, the works of theorists such as Smith et al., (1957); Schwab, (1969); Skilbeck, (1976); and Reid, (1978) justify this perspective. For example, Schwab is known to introduce the practical- deliberation approach to curriculum making. For him through deliberation, action or decision about the curriculum will be made after serious reflection and communal decision by curricular specialist and representatives (Teacher, Student, Subject, and Milieu) of those involved in the teaching of a specified group of students who are known to the decision-makers (Elizabeth, 1990; Dillon, 2009).

Perhaps this notion may share certain views with practical or interpretive curriculum model expressed by Carr and Kemis (1986) and Mckernan (2008) which appear considered important by stakeholders and which that works in terms of the context. As the model gives space for learners as members of the stakeholders which the proponents called common places of curriculum development model involved in the deliberation process, we could claim that learners active participation in constructing knowledge and meaning from their experience and the environment is considerable in this view (Stevenson, 1993 in Lydia 2011). In this case, teachers are expected to organize experience and assist learners learning in the environment. Here, the education in the environment component is partly implied and the assertions of Lee and Williams (2001); and Palmer (1998) further illuminate the relation of interpretive view to this component which reads the interpretive view sees the goals of environmental learning as externally derived, but often negotiated, and places emphasis on activities ‘in the environment’.

The understanding derived from the preceding analysis, suggests that conceptual-empiricism or practical view of curriculum is practical oriented, context-relevant curriculum making and implementation approach; where curriculum is seen as something practical involving students’ active transaction with one another, the teacher, instructional materials and the real environment. Perhaps this approach tend to comply to the present study but rather than relying on single perspective, adopting eclectic view and considering relevant aspect of each is helpful.

Differently, Reconceptualists emerged as group emphasizing curriculum understanding and moved focuses away from curriculum development by critiquing the too much emphasis placed on

technical and practical approach to curriculum (Ornstein and Hunkins, 1998). In this vein, they also challenge traditional and positivistic paradigms that "objectify facts, divorce knowledge from human meaning, and claim false neutrality with respect to politics" (Apple, 1979); and reject the behaviorist language and narrowly instrumental function of traditional curriculum writing (Giroux et al., 1981), but perceive knowledge and meaning as context and value bounded. Pinar along this line of thinking explains that through the method of self analysis, learners investigate their own response to life and therefore to educational situation, he further noted that reconceptualist draw on critical theory, which is basically concerned with empowering and emancipating people to be reflective and critique of the dominant socio-economic view and the ways in which the curriculum serves to perpetuate such view (Ornstein and Hunkins). Here, the implication of this view point is important for me in that our educational system in general and EE as incorporated in the curriculum in particular need to open wide opportunity for students to be exposed to different views and challenges in real context, in such a way critical, creative, and transforming individual citizenry will be developed.

This group like conceptual-empiricists accepts social science approach but differ in its aims and methods, in search for meaning and intent embedded in the schools, viewing them "as part of a wider societal process" (Giroux, et al., 1981 in Elizabeth, 1990). The critical approach in the context of EE appear consistent with reconceptualists perspective in that it emphasizes education *for* the environment, where students are required to develop their knowledge through critical thinking and reflections about their experiences and action taking in the account of political, economic and cultural issues of the society. It also focuses on critique of goals, a socially critical purpose and the undertaking of action 'for the environment' (Lee and Williams, 2001).

Consistent to curriculum reconceptualists perspective critical curriculum model emerged with a philosophical discourse linked with philosophy, social justice and equality enhancement through education and the social science as of 1970s (Habermas, 1972; Gadamer, 1980 as cited in Mckernan, 2008).

Even though postmodernism (yet relies on critical view) is being considered as emerging perspective in curriculum discourse currently, (Ornstein and Hunkins), the three perspective-technical, practical and critical discussed have been vividly surfaced in the curriculum orientation discourse. Thus, it is apparent from the discussion that the integrating framework of education about, in and for the environment can function as some mode of planned integrated model

drawing relevant ideas from the curriculum models illuminated, where the three components—about, in and for needs to be relatively balanced in terms of emphasis given to each. To this end Palmer, (1998) remind us not to stress on one paradigm disregarding the other but critically consider all and use relevant aspects for the context under investigation. It follows then, individual contexts may demand a greater or lesser emphasis to be placed on each of the elements within the integrated whole, but it must be understood that they are all represented, interlinked and mutually supportive.

As Ingram (1979) argued, however, schools appear to remain behind in pace compared to society in adapting to the rapidly occurring changes around them, to knowledge in that case. In this angle of discussion it was further argued that the tendency of school curriculum to resist change and knowledge to expand makes the integrated curriculum essential mediator of the controversy. In other words, it was indicated that the knowledge taught tends to be static, while the knowledge that is used tends to be dynamic; and integrated curriculum principle that suits EE mainstreaming into school curricula is found to be crucial means to mediate the gap occurring between learning (school) and living (society) by promoting practicality through learners engagement inside and outside of the school. The following section discusses about integrated curriculum.

#### **2.2.2.2. Integrated Curriculum**

Integrated curriculum has been defined in various ways by different educators. A basic definition of integrated curriculum is offered by Humphreys, Post, and Ellis (1981) perceiving “integrated curriculum as study that allow children broadly explore knowledge in various subjects related to certain aspects of their environment” (p. 11). It is also defined as education organized by crossing subject-matter lines, bringing together various aspects of the curriculum into meaningful connection to focus upon broad areas of study. It views learning and teaching in a holistic way and reflects the real world, which is interactive (Shoemaker, 1989: 5)

In general, integrated curriculum involves combination of subjects, an emphasis on projects, sources that go beyond textbooks, relationships among concepts, thematic units as organizing principle, flexible schedules, and flexible student groupings. There is a strong belief among those who support curriculum integration that schools must look at education as a process for developing abilities required by life in the twenty-first century, rather than discrete, departmentalized subject matter.

The subject of curriculum integration has been under discussion off and on for the last half-century, with a resurgence occurring over the past decade. As noted from the current discourses about curriculum integration there are tangible reasons for refocusing it notably the increasingly demanded events of the curriculum and the need for interconnectedness of the world. These notions are revealed by Jacobs (1989) stressing that "explosion" of knowledge, the increase of state mandates related to myriad issues, fragmented teaching schedules, concerns about curriculum relevancy, and a lack of connections and relationships among disciplines have all been cited as reasons for a move towards an integrated curriculum (Jacobs 1989). Franzie Loepp (1999) in similar way signifies integrated curriculum as generating greater intellectual curiosity, improved attitudes towards schooling, enhanced problem solving skills and higher achievement. Almost every teacher has experienced the feeling that they lack enough time to accomplish all what they are supposed to do; it seems that every year there are more things added to the curriculum while the available time remain the same. This feeling of frustration is one of the motivations behind the development of an integrated curriculum.

These forces in contemporary schools are reinforced by Benjamin (1989, pp. 8-16), when he cites the trends towards global interdependence and the interconnectedness of complex systems, the increase in pace and complexity of the twenty-first century, the expanding body of knowledge, and the need for workers to have the ability to draw from many fields and solve problems that involve interrelated factors. Each of these trends is relevant to the discussion of integrated curriculum, as schools move away from teaching isolated facts toward a more constructivist view of learning, which values in-depth knowledge of subjects. This view finds its basis in the work of Piaget, Dewey, Bruner, and others who hold a holistic view of learning. Each of these theorists is concerned with children having an understanding of concepts and underlying structures. Proponents of the progressive education movement of the 1930s advocated an integrated curriculum, sometimes identified as the "core curriculum" (Vars 1987). The movement towards integrated curriculum is a move away from memorization and recitation of isolated facts and figures to more meaningful concepts and the connections between concepts. The twenty-first century requirement for a flexible use of knowledge goes beyond a superficial understanding of multiple isolated events to insights developed by learning that is connected-or integrated. Perkin (1991) advocates teaching for transfer and thoughtful learning when he states: A concern with

connecting things up, with integrating ideas, within and across subject matters, and with elements of out-of-school life, inherently is a concern with understanding in a broader and a deeper sense. Accordingly there is a natural alliance between those making a special effort to teach for understanding and those making a special effort toward integrative education (1991, p.7). This view supports the notion of curriculum integration as a way of making education more meaningful. Concerns about national achievement levels and high dropout rates have put the spotlight on any educational change that can lead to increased student success. "The human brain," writes Shoemaker, "actively seeks patterns and searches for meaning through these patterns" (p. 13).

Learning is believed to occur faster and more thoroughly when it is presented in meaningful contexts, with an experiential component. Of course, every brain-every student-is unique. While the search for patterns and context may be universal, every learner will have his/her own learning style. To meet these diverse needs means providing choices for students. The current movement toward an integrated curriculum, then, has its basis in theorists who advocate a constructivist view of learning. There is a body of brain research that supports the notion that learning is best accomplished when information is presented in meaningful, connected patterns.

In addition to rationale for curriculum integration finds its basis in the commonsense wisdom of teachers, who are coping with an increased body of knowledge, large classes, and many mandates..., "inability of the discipline based education approach to challenge the contemporary problem (Franzie Loepp, 1999)", which is complex, makes it more essential. When all of these requirements are added to the traditional body of knowledge for which teachers feel responsible, integration is seen as one way to meet both the needs of the students and the requirements of the state. The integration of curricular areas and concepts allows teachers to assist students as they prepare for the next century.

Finally, the movement toward a global economy and international connections, as well as the rapid changes in technology, are pushing education toward integration. The ability to make connections, to solve problems by looking at multiple perspectives, and to incorporate information from different fields, will be an essential ingredient for success in the future. Research results showed fewer effects of integrated programs on knowledge as compared to attitude. This is notable from the next description; there is a small body of research related to the impact of an integrated

curriculum on student attitudes. MacIver (1990) found that in integrated program students developed team spirit and improved their attitudes and work habits. This was attributed, in part, to the fact that teachers met in teams and were able to quickly recognize and deal with a student's problem. As students are actively involved in planning their learning and in making choices, they are more motivated, reducing behavior problems. Jacobs (1989) also reports that an integrated curriculum is associated with better student self-direction, higher attendance, higher levels of homework completion, and better attitudes toward schools. Students are engaged in their learning as they make connections across disciplines and with the world outside the classroom.

Positive outcome related to integrated curriculum reported by researchers like, Lipson (1993) summarizes the following findings: Integrated curriculum and resultant integrated knowledge base enable students apply skills and leads to faster retrieval of information. Multiple perspectives lead to a more integrated knowledge base and encourage depth and breadth in learning. Integrated curriculum promotes positive attitudes in students as it provides for more quality time for curriculum exploration and viewed (Druger in Ignatz, 2005) as providing a meaningful context for knowledge and skills with a balance of content and process. It also offers opportunities for students to make connection with past and present life experiences and deals with issues in a holistic manner and enables students to retain knowledge, develop higher order thinking skills and achieve deeper understanding. Integrated approach is perceived important for EE planning, where it is argued (UNESCO, nd) that primary school is the natural(developmentally appropriate) place to make children familiar with EE for their view of the environment is of holistic type suggesting that they are not prepared well for compartmentalized learning. While an individual teacher may or may not have expertise in each content area, members of teacher teams are able to work together to find connections that cut across single content areas (Lipson 1993). Themes that promote the linking of concepts and lead to deeper understanding are more effective.

### **2.2.3. Approaches to the Integration of EE into the School Curriculum**

As there are different ways of conceptualizing the terms EE and curriculum; there exists different ways of integrating EE components into school curriculum. The EE can be integrated into school curriculum either as separate subject, as theme organized around issues, or integrated or harmonized into all subjects' areas of the curriculum. Connecting to this, the issue of relevance and

localizing environmental learning is also highlighted. This sub-section addresses each of the above approaches and highlights issues of relevance and indigenizing environmental learning.

### **2.2.3.1. Environmental Education as Independent Subject**

Environmental education can be delivered as independent subject, in the form of discrete contents standing alone. This approach is considered by many as traditional way of curriculum organization where content is emphasized forcing students to learn many different subjects (Reinhartz, 1997; Walker, and Sharp, 2001). Even though it is suggested by international commissions to EE as interdisciplinary, there are observations where EE is delivered as separate subjects. For example according to Walker and Sharp (2001) in the past, education *about* and education *in* the environment was the focus of EE and it was treated as "nature studies" within the area of natural sciences. Similarly, it is reported that countries like Nigeria and England among others, organized EE as separate subject having its own syllabus (Lydia, 2011). Differently, there are arguments against the organization of EE as independent subject. The contention advanced include among others, one, treating EE as single subject reduces the opportunity of achieving its internationally considered goals that intend to improve environmental condition through re-addressing of man/woman-nature relationship. Two, students may not learn as intended if it is given single subject status it will be left for chance either to be chosen or not. Then, it follows that EE is accepted to be incorporated in all subjects of school curriculum by the majority of scholars (Conde and Sanchez, 2010:490; Bodzin, 2010; Disnger, 1990).

Different research results affirm the above notion. For example, according to Palmer (1998), in Tbilisi declaration, it was stated that:

Environmental education should not be just one more subject to add to the existing programs but should be incorporated into programs intended for all learners whatever their age may be (UNESCO, 1977:20).

In this line of discourse, some clarified that environmental learning should be infused throughout the curriculum in all subjects at all grade levels. Where they state essence of environment in terms of everything, intimately inter-twined with our every being and with everything we learn. Hence, there should be no need for an identity for EE; all education should be environmental. Others further attempted to illuminate the role teachers can play to EE integration by asserting that, the

interdisciplinary search for resources and associated involvement of teachers in the experiment, certainly contributes to the improvement of the reality of the incorporation of environmental education into the classroom (Conde and Sánchez 2010:490; Disniger, 1990). In conclusion, because of the holistic and multidisciplinary nature of environmental education (Bodzin, et al., 2010; Palmer, 1998; Smith, 1997) and internationally agreed EE goals, it appears that the tendency of organizing EE as independent subject is minimal. In Ethiopia too, because of similar reasons, and perhaps over crowded school subjects EE is decided to be delivered in a cross-curricular or integrated component in all subjects at all levels (MoE, 2010). It is worth noting that integrating EE around core concerning idea issue or problem, and integrating it into all school subjects deserve examining for implication of contrasting insights.

#### **2.2.3.2. Organizing Environmental Education around Concerning issues or Problems**

This approach is integrative approach where teacher and students identify the learning content based on significant issues or problems without considering the boundaries of disciplines. This involves teacher's facilitation through provision of guide and resource and student's active learning by identifying problem or issues of concern, analyzing researching solution and making intervention etc. To this end Beane, (1995:616) describes that curriculum integration starts by the idea that the sources of curriculum ought to be problems, issues, and concerns posed by life itself.' For Beane such concerns fall into two spheres: self- or personal concerns and issues and problems posed by the larger world. Here the core of the unit is issue or problem of concern instead of topic (Fraser, 2000 in Lydia 2011; Dawit, 2007:29) and this suits context of environmental learning (Reinhartz, and Beach 1997). Dawit, drawing up on thematic curricula with six components of which Problem Situated Learning (PSL) is one; described PSL as the provision of real world problems as authentic contents, where students get opportunity to confront problems they know very well or contents of global issues organized in the forms of problems and questions.

The overview of this approach suggest that, the method appears significant because it opens opportunity for learning to be relevant and holistic; where students are allowed to engage in real life issues and problem addressing in the learning process, learning become more relevant and learners critical. Moreover for it draws knowledge and insight from different disciplines while organizing and dealing with issues, problems learning becomes holistic which is consistent with purpose of environmental education.

### **2.2.3.3. Integrated approach into all School Subjects**

It is evident from the preceding discussion that the integrating EE into school curricula has been supported by international agreement. Accordingly, integrating EE components into all school subjects has been accepted and implemented by nation states of the world. Integration is a concept involved in curriculum development process. Curriculum integration essence and importance have been examined by different educators such as (Drake, 1998; Fraser, 2000; Gibson and Ewing, 2011).

Integration both fosters coherent education and permits connection within and across disciplines (Fraser) and allows learners to get a unified view of knowledge and in-depth meaning of the subject matter. However, others claimed that (Ornstein and Hunkins, 1998; Fogarty, 1991) the ultimate integration take place in the learner mind. Integrated approach to curriculum development is advocated for (e.g. Drake, 1998), where she argued that the world we live in is dynamic, interconnected and interdependent, so the knowledge about this world should be presented as interconnected and interdependent way; and so, EE cannot exist as separate bit. It approximates real life and, needs to be issue driven rather than topic, reflect the real world and suit active involvement of learners (Gibson and Ewing, 2011). In this connection I could argue that though integration is an aspect of design it never be limited to planning level because as it has been highlighted earlier, teacher and students are claimed to create curriculum at the classroom and in the learning process. To this end, Case (1991) argued that the loci of integration comprise the following levels: state, district or school, and classroom level integration. Classroom integration refers to teacher's role in planning and carrying out units of study, (p.220). Supporting this idea, McNeil (1995) denotes that teacher creates curriculum in the classroom with students. Teachers through their lesson planning, in the form of long range, unit, session or periodic lesson planning initiate a curriculum that is responsive to a local situation, individual student and teachers own passion (pp.171-172). In this sense it is argued that as compared to curriculum contents included in the textbooks that appear to fragment knowledge into subject matter compartments, a teacher's unit plan can create linkages among subject matters as well as connection to life in a particular community. Especially this makes sense in EE learning for learning needs to be environmental and meaningful to learners, where the environment and local community can be used as a laboratory to

generate insight and valuable experience that promotes understanding and skills for caring and problem solving pertaining to environment and humans-nature relationship.

Consistent to this point of view, drawing to imperial research evidence of over 35 years, Morris (2008) concluded that, even though curriculum can be specified and controlled by a firm accountability, it is teachers who decisively shape the educational experience of children and young people at schools. This role of teacher becomes more important in implementing integrated curriculum like EE whereby teachers are expected to link the subject matter theory to the real life experience of the pupils via their lesson planning notably unit and session plan and actual facilitation of learning. It seems because of this that Chawa (1992), and Ornstein and Hunkins (1998) in similar ways remarked that integrated curriculum takes learners outside of the Lab., classroom and away from textbook into homes and local community, which are considered as basic resources of responsible action.

The integrating EE into school curriculum implies interconnecting all school subjects through the integration of EE (contents, issues and problems) that can reinforce each other in contributing to students' environmental knowledge skill and values. In the regard, Palmer (1998) writes that since environment is all encompassing, it should be considered in its totality and includes aspects of urban and rural, technological, political, economic, social aesthetic and ethical issues that EE has to address. Hence, this suggests the cross curricular and holistic nature of EE.

It has also been argued that aligned with integrative approach, EE at the same time does have discrete "content" that must be recognized and integrated in a progressive manner in to teaching and learning tasks. In this case Bodzin et al., (2010:46) point out that EE provides students the ability to integrate subjects knowledge ( e.g. science) and to apply it in important and meaningful ways, and serves as powerful pedagogical framework for future teachers allowing them to integrate all subjects into curricular contexts.

It is evident that currently there is adequate experience of integrating EE in subjects of school curricula of different counties like, England, Jamaica, China, Tanzania, Kenya and others (Tilbury, 1996; Palmer, 1998; Ferguson, 2007; Stevenson, 2007; MoE, 2010; Lydia, 2011; Peter, and Cheruto, 2013) depending on their respective educational philosophy, and socio-economic context. Accordingly, the study conducted in Kenya (Peter, and Cheruto, 2013) on the main streaming of

EE into school curriculum revealed that the topics on global concerns towards the environment, social impact on the environment and methods of conserving the environment were covered in the school curriculum. The same study investigated the integration of teaching strategies such as lecture, guest speaker (direct) and question and answer, group discussions, problem solving, field trip and project method (indirect) which were also supplemented by co-curricular activities like club meeting, religious societies meeting.

Yet, the approach of integrating environmental education into all subjects of school curriculum may not be free of challenges. Some researchers argue in this regard that, when EE is taught as component of other school subjects its contribution to students' environmental understanding, and development of skill, values, competencies and actions can be either implicit or less regarded (Palmer, 1998). Similarly, barriers such as influence of traditional schooling mechanisms (e.g. emphasizing test achievement, standards and etc), less teachers' commitment and capacity to teach EE, unequal weight accorded to environmental education component in different subjects are among those documented (Lydia, 2011; Canan, 2011; Spiropoulou et al, 2007; Daniel, 2007). Spiropoulou and others, after reviewing different studies concluded that, the large proportion of teachers (e.g. Greece) hesitated to engage in environmental programs perhaps due to limited environmental knowledge and literacy they obtain from their pre-service and in-service trainings (p.448). They also found out the ineffectiveness of integration of EE in to school subjects (perhaps due to traditional teaching paradigms, inflexible curricula, heavy load of school knowledge and insufficient time available for in-depth approach to the study of environmental matters implied earlier). Consistent to this notion (Daniel, 2007) examined the nature of mainstreaming EE into Teachers Education of Ethiopia and discovered that environmental education knowledge of the prospective teachers is inadequate, that bleak their future readiness to pursue effective environmental teaching.

In spite of these challenges, integrateing EE into school curriculum approach is accepted by many settings, of which Ethiopia is a part. The ESDP-IV document justifies this assertion. In the document it is clearly specified that EE and environmental protection (as one of the seven cross cutting issues) would be included in the curriculum at all levels (p.104). It is stated that, the emphasis is given to raising awareness of all administrators, teachers and students about the importance of EE and environmental protection; which is further intensified by focus given to

science area and use of co-curricular strategies like club to integrate EE and protection to school curricula (MoE, 2010:104; Aklilu, 2012:33-34). In conclusion, the present study emphasizes on integration approach regarding the incorporating of EE contents and issues into all primary school subjects. As I mentioned earlier, along this approach ideas and principles from different curriculum orientations or models (hybrid) can be considered to conceptualize the integration process. In this context integration of the environmental dimensions into school curricula occur both at document level (e.g. in text book), and learning process (e.g. In the form of transaction between learners and teachers, learners and learning materials and environment, and local community etc...). Integrated or interdisciplinary approach to the learning process is believed to contribute to relevant and meaningful learning. Thus, highlighting context and experience of localizing or indigenizing of environmental learning seems significant to be considered here.

#### **2.2.3.4. Environmental Education and Curricular Localization**

Until recently, the education systems of African counties have been criticized for being divorced from the real lives and situation of their citizens. Against these problems, some far sighted scholars (such as the first president of Tanzania, Julius Nyerere) visualized the integration of classroom knowledge and local or Indigenous Knowledge (IK). In Nyerere's word, it was stated that conceptualizing folk and classroom knowledge together is important to make education relevant to the community, through the provision of intellectual tools, moral values, and skills needed to meet the dynamic situation of community (Semali and Stambach, 1997). It is further argued that in many contemporary settings the contents and organization of curriculum are structured in ways that deviate drastically from students home and out of school experiences. Importantly, school knowledge and IK offer a meaningful analysis of the way this intersection related to educational practices. However, controversy has been noted in this regard- on one hand, the educational reforms of western oriented or models disregard the African IK; because the advocators (e.g. administrators and researchers) of western perspectives characterize African indigenous knowledge systems as "primitive", "unscientific" and "wrong". Dessalegn Fufa (2014), drawing to the work of researchers (e.g. Warren, 1992; Otiende, Ezaza and Boisvert, 1997) on IK, claims that in spite of the prevalence rich useful indigenous knowledge in African society, simultaneously there was a tendency to debase and consider African indigenous knowledge as useless by colonizers.

However, IK is given due recognition by numerous societies regarding the interrelation existing between humans and their environment. To this end Semali and Kincheole (1999) as cited in Dessagn (2014) indicate that for many people of Africa, Latin America, Asia and Oceania, IK is key to exist meaningfully and harmoniously with their environment. IK reflects the dynamics in which the residents of an area have come to understand themselves in relationship to their natural environment and how they organize that folk knowledge of flora and fauna, cultural beliefs and history to enhance their lives (Dessalegn, 2014). Subsequently, the understanding emerged suggests that the outsiders due to their failure to understand the value and the inherent meaning of the local or indigenous knowledge of the Africans consider it as wrong mistakenly. Supporting this position it is argued that educational strategies derived from Western experience science and technologies often remain unsuccessful when applied to a new setting for the fact that the experts simply do not understand the people they are attempting to help and fail to account for local knowledge and attitudes.

I could claim in here that, local understanding promotes opportunity for more meaningful and authentic knowledge construction and may inform the global at large. It is often contended that IK conception as what local people know and do, what they have known and done for generation. It is also revealed that Africans are immersed in a cultural setting that value the authority of elders and emphasize practical knowledge. One could ask about the essence of authority of elders and practical knowledge here, and for me elders' informally and formally accumulated knowledge inevitably characterize long-lived, tested and context-specific experience and hence these make indigenous or local knowledge relevant to the life and problems of the community concerned. The observations of Workineh (2001) and Dessalegn (2014) support this view point, where they respectively claimed that IK does not contradict scientific or modern knowledge and as scientific knowledge is tested in laboratory, IK is tested by real living. Consequently, it must be noted that classroom lesson including environmental learning need be linked to real life experiences and issues of our community if learning need to be meaningful and sustainable and harmonious relationship of humans and natural environment to be attained.

In Ethiopia, different local or traditional practical knowledge and skills relevant to the reality of the respective community need be considered. Instances of studies documenting the indigenous knowledge and experience of Oromo people that has harmonious relationship to their environment could be cited. The study on traditional practices of forest resource conservation in Jimma

(Kitessa, 2007); the findings documented on insights and ethics contained in indigenous beliefs and values of Oromo society about sustainable environmental management and protection in Guji (Dessalegn, 2014), Borena (Teshome, 2013), Ambo (Workineh, 2001), and Ilu Aba Bora (Dixon and Wood, 2001), could serve as reference to the rich lived experiences and practical knowledge the community possess. Workineh explained that, the Oromo people possess accumulated practical knowledge of their environment (e.g. soil, water, vegetation, wildlife management) through long stayed experience and productive activities. Their positive attitude toward natural vegetation/plants is manifested by the belief the community held such as big trees symbolizing respect and happiness.

Moreover, trees are perceived (Workineh, 2001), as children of *Waaqa* (God) and the earth can only be respected with its trees. In this connection green environment is seen as symbol and presage of fertility (germination and vegetation) and all good things and green environment is regarded as source of life. Dixon and Wood in a similar vein revealed that farmers of the study site use wetland and plants as indicators of changes in soil fertility or hydrological conditions. For instance according to the authors the growing and colonizing of plant-Kemete (*Leersia hexandra*) is known as indicator of decrease in soil fertility and the need for remedial measure-fallowing; likewise plant-inchinne (*Triumfetta pilosa*) seen as manifestation of increase in soil fertility and its appearance in a wetland is regarded as end of a fallow period. Consistent to the preceding results, Kitessa's (2007) finding pinpointed that the local community of Jimma Zone involved in the study are well aware of the value associated to forest and use traditional conservation approach for bigger trees such as *Ficus Vasta*, *Podocarpus falcatus*, *Ekebergia*, *Capensis* and *Ficus sychmore*. It is further claimed that, this practice is attributed to religious and cultural reasons where more respect is accorded to social obligations and cultural values as compared to the one enforced by the government. But sadly it is also indicated that such useful and pro-environmental experiences was eroded owing to the impacts (Feyera and Demel, 2003 as cited in Kitessa, 2007) related to political and economic changes in the society in the last four and five decades. In spite of this fact, the author ascertained that traditional conservation practice of plant or tree species mentioned are respected by the community because of their traditional association with the trees. The insight emerged from the study result suggest that natural environmental matter is often the concern of rural community and the local or indigenous knowledge possessed by these communities

illuminated, appear relevant and sound for proper understanding and protection of natural environment and its resources.

However, it was found that no significant consideration is given to the traditional systems of environmental protection and resource conservation practice of the local communities. Hence, I could argue that if the natural environment and its resource needs to be properly managed, conserved and sustained for new generation, the local community knowledge and experience in this regard have to be considered and integrated into the educational programs in general and primary education in particular. In this connection there is little doubt that overlooking the interest and values of the community concerned, one cannot be effective in pursuing certain package. Cotton, (1996) in this sense claims that modern conservationist and professionals often suggest conservation methods and principles which do not go with the interests and resource management ways of the local community. In next section issues related to teaching-learning approach will be discussed.

### **2.3. Teaching and learning of Environmental Education**

Educational goals including environmental education achievement needs curriculum construction, and inevitably the curriculum designed will be enacted through teaching-learning efforts. Teaching EE requires knowledge, attitude and skill of integrating the domains of EE and balancing them as needed. However, the current EE practices appear different from this fact. In this regard, Tilbury (1996) showed that schools emphasize on education about the environment that involve dealing with ecological concepts and technical solution to problems in the classroom practices. Similarly, Walker and Sharp (2001) disclose that, in the past education about and in the environment was the focus of environmental education emphasizing the development of knowledge about the environment and the acquisition of skills using the environment as the medium.

However, currently there has been a shift of emphasis to the integration of the EE components in holistic manner and more on education for the environment. In this connection, different perspectives and strategies suggested to be integrated into the school curriculum deserve reminding. For instance, Palmer (1998), propose the integration of experience, concern and action in the instructional planning which were absent from the first curriculum model she adopted. Lydia (2011) later on added competence to palmer's ideas. In similar way it is claimed that sensitivity to

nature (Ritta, 1998; Butz and Eyles, 1997), environmental ethics, local experience (Kaushik and Kaushik, 2004; Stevenson, 2011) as components of EE should be integrated and connected during teaching-learning process. .

Learning of environmental education needs to be sequenced based on the three organizing components of environmental education-education *about*, *in/through* and *for* environment (see figure 1). Similarly, the elements suggested to be integrated (sensitivity to nature, understanding, experience, concern, action competence and environmental ethics), are supposed to be focused in holistic at teaching-learning level. Education *in* the environment refers to (learning based on the environment, real life-experience, using resources or media, situations and/or problems from the actual environment); Education *about* the environment emphasize knowledge and understanding about environmental concepts and issues, problems, humans-nature relationship and Education *for* the environment(fosters concern, respect for the environment and action competence, and responsible decision making for the improvement of environmental conditions).

Studies further reveal (e.g. Disinger, 1993) that restricting teaching of EE to ecological concepts and conceptual awareness about environment not sufficient to cause informed and responsible behavior in learners, unless it is extended to issue investigation and further to environmental action skills.

Learning in EE context involves understanding natural systems, interrelationship among the systems and how human systems relate to the natural environment and acquiring basic skills that prepare people to deal effectively with environmental problems and issues. In particular an environmental ethic is perceived to be evolved within the learner a development of an ecological conscience and responsible commitment (Disinger 1993 in Smith, 1997:168).

Then, EE teaching requires integrating the components just proposed to develop environmentally literate, responsible and competent citizen who can contribute to environmental protection and sustainable development. The following section covers knowledge base of EE teachers and methods of teaching EE components.

### **2.3.1 Teachers Preparedness and Teaching Environmental Education**

It is logical to argue that teachers should be well educated and appropriately trained if effective implementation of educational programs in general and environmental education in particular is needed. In this regard student centered classrooms is perceived characterizing students actual control of the academic tasks and classroom climate for their learning. It offers autonomy and responsibility, multiple opportunities for contextual control and regulation (Pintrich, 2004: 399). Teacher preparedness hence, needs to be aligned to such innovative approach notably student centred as contrasted to teacher centredness. For facilitating meaningful learning, teachers should be well prepared in an on going ways. Teachers' preparedness via training, researching, continuous professional development strategies are expected to influence the approaches of teachers to integrate environmental education in their teaching practice.

Therefore, without undermining the importance of continuous teachers' professional development, foundational knowledge in subject matter, pedagogy and context is prerequisite.

#### **Content and Pedagogic Knowledge**

Subject matter knowledge can be understood as the teachers' knowledge obtained in order to organize the concepts, principles and theories of a given discipline as well as the knowledge of evidence used to generate and to justify knowledge claims in the discipline (Abell, 2007). It can also be understood as the subject matter substantive conceptual areas in which the teacher specializes in a discipline s/he is intending to educate students, but usually, content knowledge is developed before knowledge of students. The trends of knowledge bases of teacher education have focused on the content knowledge of the teacher (Shulman, 1986). Experience tells us that still this situation prevails at varying degree in today's teacher professional development in spite of the efforts made to bridge the knowledge and skill gaps related to the pedagogic and content area of teacher education. So the knowledge of subject matter integrating EE and general pedagogy is necessary equipment for teacher to discharge their responsibility effectively.

Pedagogic knowledge is crucial for it is believed to influence teachers' pedagogical content knowledge. PK absorbs knowledge of instructional/teaching principles, classroom and resource organization and management, knowledge of the learners and how they learn, and educational aims

(Abell, 2007) which are core for leading enhanced students learning. Pedagogical knowledge fuses the subject matter content with teaching methods, organize instruction and bring all these elements together with the learners' interests and abilities (Shulman, 1987) to facilitate meaningful learning. In this regard we could argue that as teacher's pedagogic knowledge blends teaching approaches among others and subject matter contents, it can enhance teaching-learning of EE components in primary school curricula. Further more, it is evident that the holistic and interconnectedness of environmental learning should be understood and reflected at teaching and local level. In this connection, (Capra, 2007) reminds us that as living systems are non linear and based on pattern of relationship and interdependence, understanding the principles of ecology requires new ways of seeing the world and thinking in terms of relationships, connectedness and context. The general pedagogic knowledge will be more holistic and meaningful when bridged with knowledge of specific subject matters pedagogy which is termed as pedagogic content knowledge.

### **Pedagogical content knowledge (PCK)**

The concept of pedagogic content knowledge was first introduced by Shulman (1986, 1987) as a new framework for teacher education (Bodzin et al., 2010:22; Pintrich, 2004:3). The authors stated that instead of viewing teacher education from the perspective of content or pedagogy, teacher education programs should combine these two knowledge bases to more effectively prepare teachers. Pintrich (2004) by analyzing the work of Shulman and Grossman (1988) and concluded that pedagogical content knowledge is made up of other three knowledge bases namely subject matter content knowledge, pedagogical knowledge, and knowledge of context. Similarly, Cochran, King, and DeRuiter (1991:1) understood PCK as the manner in which teachers relate their pedagogical knowledge to their subject matter content knowledge in the school context for the teaching of specific students. It is imperative that, in this definition four components are incorporated: knowledge of subject matter content, knowledge of students (their experience, maturity level, ability and interest etc), knowledge of environmental contexts, and knowledge of pedagogy. Thus, possessing these knowledge components in integrated way facilitates EE and sustainability issues learning whereby the experience and creativity of individual teacher inevitably is expected to intensify this effort for the optimization of the the learning outcomes. Likewise, Bodzin et al. (2010) specified that PCK has become a way of understanding the complex relationship between teaching and content through the use of specific teaching approaches, where

understanding of this relationship is developed through an integrated process rooted in classroom practice. It was also found that studying the academic discipline cannot necessarily prepare teachers with the understandings needed to teach that content; instead teachers' academic knowledge must be transformed into instructional activities appropriate for classroom instruction and beyond. Similarly it was contended that teacher uniquely differs from a content specialist in the following manner:

Teachers differ from biologists, historians, writers, or educational researchers, not necessarily in the quality or quantity of their subject matter knowledge, but in how that knowledge is organized and used. For example, experienced science teachers' knowledge of science is structured from a teaching perspective and is used as a basis for helping students to understand specific concepts. A scientist's knowledge, on the other hand, is structured from a research perspective and is used as a basis for the construction of new knowledge in the field (Cochran, King, and DeRuiter, 1991:5).

Pedagogical content knowledge is believed to involve special attributes that help someone transfer the knowledge of content to others (Geddis, 1993). For example it may qualify and represents these ideas, concepts... using the most powerful analogies, illustrations, examples, explanations, and demonstrations-in a word, the ways of representing and formulating the subject that make it comprehensible to others" (Shulman, 1987: 9). PCK of a teacher is believed to guide a student to understand content in a way that is personally meaningful; and it also entails "an understanding of how particular topics, problems, or issues are organized, presented, and adapted to the diverse interests and abilities of learners, and presented for instruction" (1987:8).

Pedagogic Content Knowledge is perceived that "the key knowledge base of teaching lies at the intersection of content and pedagogy. It plays roles in the capacitating a teacher to transform the content knowledge he or she possesses into forms that are pedagogically powerful and yet adaptive to the variations in ability and background presented by the students" (Pintrich, 2004:15).

It was found that taxonomy of teaching and learning science incorporate five categories or domains of science education (McCormick and Yager's 1989). The five hierarchical domains were organized by their importance:

- a. Knowing and understanding (scientific information),
- b. exploring and discovering (scientific processes),

- c. imagining and creating (creative),
- d. feeling and valuing (attitudinal), and
- e. Using and applying (application and connections).

It is argued that in science education too often limited students to the first two domains that primarily focused on the processes and products of science (McCormick and Yager, 1989). They stated that the other three domains needed to be included more often in science instruction due to the increased focus on science, technology, and societal issues. Implicitly it appears that these overlooked issues equally seem missing from environmental education implementation which is consistent with education in and for the environment.

The integration of all the attributes can occur in stages, cooperatively, or separately. It is asserted for example that, a teacher might decide to introduce the concept of crystal structure (content knowledge) using rock specimens from local geologic formations (knowledge of context). The teacher can then employ performance based assessment (knowledge of students' learning styles) by asking students to match rocks to crystal lattice/web structure models. The variety of ways that a teacher can develop one or many of the PCK attributes also implies that there is no one prescriptive way to impart PCK to a teacher (Pintrich, 2004). It is worth noting here, that the PCK attributes implies ongoing development of teachers' profession, making each a lifelong learner who continually develops each of these attributes or create new innovative ones throughout his/her teaching career.

From the preceding discussion it is apparent that, Knowledge of context is equally essential for teachers to assist students' effective learning. It seems because of that Barab and Roth (2006) stressed situation knowing and meaning in environmental learning and of individual-environment relations as important issue. The connotation emerging from the reflection implies that significant environmental learning is not only *about* and *for* the environment but also carried out *through* and *within* the environment suggesting that teacher needs to understand the context where the teaching-learning process is expected to occur in diverse ways. It is further claimed that the more educators fail to engage students in meaningful learning using environment and the more the learning becomes isolated facts or concepts, the less it is connected to the situations and be relevant and powerful tools to the learners. Along this angle of contention, it is believed that K-12 curriculum

would be more usefully arranged around problematic situations with pertinent resources and tools than around disciplinary content or particular standard these days. Moreover, some of the key areas for professional development in environmental education may include involving communities in environmental and health initiatives, networking opportunities for teachers to share best practices, strategies and techniques for teaching students critical thinking skills, and integrating EE into K-12 curriculum (Riordan and Klein 2010).

In the same vein, PCK can be recognized as a repertoire of pedagogical constructions (Hashweh 2005) in Bodnzin et al. (2010) that teachers acquire when repeatedly teaching a certain topic. Educators also claimed that even within one school, the same teacher may experience variations of an effective way to teach single topic e.g. “force” on Monday morning a section in the same way on Wednesday afternoon section of the same level. In this sense it is argued that, an expert teacher is sensitive to such differences and is flexible enough to adapt his or her approach, on the spot, to how students respond. Thus, PCK includes knowledge of enhancing student learning in a variety of ways. First, this development is rooted in teachers’ specific professional contexts and influenced by factors such as characteristics of the school culture and its population, available time, and local support for professional development (ibid). In short, we think that programs aiming at the development of PCK, like other recent forms of professional development, should be based on ‘constructivist’ and ‘situative’ theories rather than on behavioral approaches.

On top of possessing knowledge base for teaching, teachers need to engage in research and continuous professional development. In this regard considering the Schon’s (1983) idea of a reflective practitioner, Elliott’s (2008) idea of action research as a means of systematic reflection for improving teaching, and Hargreaves and Fullan’s (2000) idea of developing thinking of teachers for preparing effective agents for educational change is helpful (Har, 2011).

However, teacher-training courses are often criticized as being too theoretical and that a large gap exists between what is taught in the courses and classroom practice. It is also argued that the reflective model of learning plays an essential role in bridging this gap (ibid). Similarly, research conducted in Ethiopia on teachers’ education found out that a declining trend of outdoor environmental teaching, inadequacy of environmental knowledge of prospective teachers (Daniel,

2007:1); and others discovered that (Dawit, 2007:25) teachers' awareness and practice of problem solving skills and approach appear uncertain and deviate from the requirement of problem situated learning principles.

### **2.3.2. Approaches to Environmental Education Teaching-Learning process**

Evidently, the curriculum designed is expected to be learned via numerous methods of teaching and materials. Hence, next, ideas and strategies (pertinent to environmental education teaching) suggested by different researchers will be analyzed. Accordingly, Dillon and Scott (2002) attempted to illuminate the role of environmental education (EE) perhaps as method for different subjects by emphasizing on science education. It is claimed that EE is uniquely placed to offer science education a range of perspectives on knowledge and situated learning. Through its multi-disciplinary origins and traditions, environmental education offers a conceptual richness that challenges current thinking in science education. It is claimed that there is a shift from seeing 'environment' as a focus of science concepts to seeing a science education as one that, properly, seeks to help students understand environmental issues in the context of their lives, and their lives in the context of environmental issues (Dillon and Scott, 2002). Environmental education provides an opportunity to bring modern and challenging social and scientific issues into the classroom that is currently hindered by the crowded and conservative curricula (e.g. science) of many countries around the world. Likewise, it is also indicated that among fundamental pedagogical methods of EE: hands-on activities, relevant subject matter, and topics that engage students and encourage participation of students are centre of focus (Riordan and Klein 2010:119). Studies further revealed that EE promotes the following qualities in students: critical thinking, problem-solving, leadership characteristics, high academic engagement, and healthy lifestyles (Archie, 2003; NAAEE, 2001).

More importantly, environmental education pedagogy is perceived as view of teaching as a "creative and dynamic process in which pupils and teachers are engaged together in a search for solutions to environmental problems"(Riordan and Klein, 2010).

Likewise, Robottom (1987b, 1987c, 1987d) advocates for innovative teaching approach which characterize-interdisciplinary planning, active investigation of local issues, and vigorous/robust participation—with students—in activities around environmental improvement (Riordan and Klein

2010). However, many teachers, while interested in engaging students in EE, struggle with successful integration, whether in the classroom or in connecting students to out-of-classroom fieldwork. Different researchers in the areas of EE also advanced different views and strategies regarding the teaching-learning process of EE. Situated learning (Barab and Roth, 2006), problem based learning, (Savery and Duffy, 1995), process skills teaching (Monroe and Cappaert, 1994) are among approaches suggested to be considered in this regard.

According to Monroe and Cappaert in their project emphasis was given to attitudes and skills rather than subject-specific knowledge; where their strategy: 'process integration', focuses on objectives important to most subjects:

- a. critical thinking,
- b. cooperative learning,
- c. value clarification,
- d. multicultural sensitivity

It is apparent from the above view point, that in the stages of learning EE, holistic understanding, concern/value, and action skill competence pertinent to environmental matters and humans' relations to environment must be considered. In this regard, it is claimed that emphases placed on process skill appear supported by policy makers and environmental educators. Education that provides learners with process skills is central to the goals of EE and teachers of any subject can use EE to creatively address process objectives. For example teacher may assign specific projects or, a more student-centered curriculum, guide students in developing their own investigations and actions. Obviously, even when there is no a directly designed subject or contents of EE in different curricular areas, attempts can be made to integrate it in the form of problems or situation by relating the subject concepts, theories and etc., to real life experience from the environment.

Differently, however, related to implementation of EE, research finding documented different challenges, (Tilbury, 1996; Melaku, 1994), which may include: lack of understanding of the goals of EE, where teacher involved in the study demonstrated few understanding about the concept and purpose of EE, and perceiving it as body of knowledge rather than a learning process.

As I have stated earlier in this chapter, many educators suggest for EE teaching, the use of principles and strategies that help pupils to be sensitive to natural environment, informed about it and committed to protect and use it responsibly while living with it and each other harmoniously.

Along this line of argument it is suggested that, outdoor learning, cooperative learning, problem based learning etc. are stressed as suiting environmental learning. Consistent to this notion, Constructivists advocate that learners construct knowledge for themselves individually or socially while learning. It means student constructs meaning-as he or she learns (Hein, 1991). It is further elaborated that in constructivist classroom, learning occurs as students collaborating with the teacher; students seeking out knowledge in a subjective (different) way. There is a focus on student-directed learning and the teacher is a facilitator. Assessments are individualized and teaching-learning characterizes subjective, alternative assessment: portfolios, presentations, and cooperative groups. Thus, pedagogy with this frame is emergent active, and individual with focuses of assessments and the instructional methods on individual growth. The means of achieving the optimal, individual growth is experiential, student-directed (centered) learning. Inevitably this can allow EE teacher conduct active and engaging lesson that is related to students' real life and environment. Contrastingly, both positivist and critical pedagogy are believed to comply with behaviorist and critical pedagogy theories of learning respectively. The positivists' pedagogy relies more on traditional ways of teaching such as lecture and characterizes planned, structured and organized, by subject expert.

The focus in terms of assessments and the instructional methods is measurable and observable outcomes' but with little student interaction in the classroom. Yet, critical theory pedagogy is planned transformative and emancipator in nature; and focuses on change in respect to assessments and the instructional methods. Teachers adapting this perspective often use both objective and subjective assessment, each including issues of history, politics, and the restrictive nature of some content areas. It aims at libratory change while using both direct and indirect instruction and objective and subjective assessments, this aligns with critical pedagogy theories of learning (Bucci, 2002:79-82; Hein, 1991). The implication clearly suggests the need to allow learners be exposed to environment, resources, data etc., so that they critically deal with and construct their own knowledge and meaning from those experiences. it seems because this, that Hein (1991) contends that helping the learner understand the world is not enough unless we ask him/her to construct his or her own world. Supporting this view Saylan and Blumstein (2011) explained that exposing students to the experiences in the nature can make most students develop concern for the environment if not all. They also described that pedagogy outside the classroom makes the learning more practical, and develops students' properly understanding and respect for the natural

environment. Then, logically these are expected of all humans for all humanity face climate change, pollution, and loss of biodiversity together and solution must grow not only in educational institutions but in homes and communities as well.

Therefore, we could argue that schools should be committed to foster environmentally active and responsible citizen through varieties of outdoor experience, with some creative and imaginative strategies and practical examples as they occur in environment/nature is much preferred to memorization of abstract concepts in the classroom.

In line with this, the K-12 curriculum framework of Ethiopia( MoE, 2010:3), intends adapting the principles of active learning and the applying constructive learning theory principles that underpins competency-based education, emphasizing the transfer of learning, flexibility in teaching and learning methods and strategies. It is also suggested that varieties of active learning strategies such as doing, observing and dialogue to be used currently at the level mentioned. Yet, as I touched earlier it seems helpful considering and integrating the important element from variety of perspectives (e.g. positivist-behavioral, critical theory-critical pedagogy) along with constructive learning perspective for EE instructional planning and practices, because it is cross disciplinary in character.

#### **2.4. Constraints Encountering the Teaching-Learning Process of Environmental Education**

Experiences show us that mostly there are interfering barriers in the process of putting the developed curriculum into practice or effect. Environmental education cannot be exceptional to this. In this regard studies conducted in different countries revealed diverse constraints impeding the implementation of EE as intended at curricular level. For example, according to Lydia (2011) a study carried on Finnish teachers of a primary school in North Carelia disclosed barriers encountering environmental education teachers as including lack of time, financial resource, teaching and learning materials and knowledge (Pulkkinen, 2006). In another study conducted in Hong Kong, the kind of barriers perceived by teachers in primary schools in teaching environmental education are lack of knowledge, lack of lesson time, lack of learning materials and the issue of the safety of learners when the teacher wants to take them out to provide them with

field experience, especially when there are many children in the class (Chi-chung Ko and Chi-kin Lee, 2003). From experience it is evident that others such as inadequacy of supportive context for example inconvenience of school philosophy, weak extracurricular activities, and loose community involvement is constraints to the practice of EE.

It is also found that, the predominating traditional schooling (focus on testing, standards, inflexible approach etc) appear contradictory to the holistic nature of environmental education, which is supplemented by the less commitment, limited capacity of teachers to teach EE components ( Spirpoulou, et al 2007; Daniel, 2007). The impression from the discussion suggests that these impediments may be rooted in the curriculum, teachers' pre and in service professional preparation and development implying that they need to revisit.

## **2.5. Chapter Summary**

This chapter has examined main issues such as historical development of EE, conceptualization of EE and related terms, EE and school curriculum, teaching and learning of EE, barriers to the teaching and learning of EE as core components of theoretical underpinning of the study. Then, conceptual framework has been designed based on the understanding and insights emerged from the literature reviewed.

Accordingly, the root of EE, as its present form, is said to be traceable back to the 1960s and 1970s (Palmer, 1998; Stevenson, 2007). EE is sought for proper environmental understanding and foster skill to solve environmental problems facing world nations and to prevent occurrence of the future. It was further noted that, later development of the environmental education the dynamic caused emergence of many interfering ideas and concerns which are not agreed upon. Particularly, the EE-ESD relationship and issues has been debatable. There are two positions held regarding the EE-ESD matter. The UNESCO initiated and preferred ESD with the intention of replacing EE with ESD notable after Rio summit of 1992 has critically been blamed for ignoring environmental core concern in its goals and emphasizing economic growth and benefit extraction. This move is also perceived as further exacerbating environmental crises and humans-natural environment relationship rupturing. Though the effort of replacing EE by ESD is considered by some (e.g. Sanera and Shaw, 1999; Nevin, 2008; Yalcinkaya, 2013) as normal change (by viewing EE as narrowerly focusing on environment and its problems compared to ESD), most other scholars in

the area opposed the move. The latter group contended that EE is a well established field and can address the matter ESD is assumed to treat, but ESD is criticized to be based on imprecise conception-Sustainable Development (SD), (Jickling et al., 2008; Postma, 2006; Clover, 2000); further contention advanced on the limitation of ESD as related to EE stresses vagueness of the concept root and absence of any logical, epistemological, methodological or ideological justification to accept ESD as a substitute of EE in the eyes of environmental problem dynamism confronting human society (Robottom, 2007; Cartea, 2005; Bhagwati, 2004; Tilbury, 2002; Dobson, 1996).

In the context of this study cognizant of the sustainable way of humans' natural environmental interrelationship, the concept of EE and approach is maintained as umbrella term. In similar vein as a central concept in the present study environmental education is understood as learning process that enables individuals to become more knowledgeable about their environment, humans-environment interrelationship and to develop critical and rational thinking, responsible environmental behavior and action skills so that they can be concerned about, protect and improve the quality of the environment, thereby improve the quality of life on the earth (Kulnieks, 2013; Nordström, 2008, in Lydia, 2011; Steele, 2011).

Ethiopia as part of the world nations accepted the consensus held and committed itself to incorporate EE into its educational system (TGE, 1994). Thus, pertaining to structuring of EE into school curricula, aims and components to be considered as well as approach followed various view points and experiences have been noted from reviewed sources.

It was understood that technical, practical and critical curriculum development perspectives prevails historically, yet believed to co-exist in the current theoretical curriculum development discourse. Technical or tradition view focuses on subject content and efficient transmission of knowledge. It is perceived as managerial style of end-means rational planning (Mckernan, 2008) of curriculum by instructional behavioural objectives. This perspective shares the viewpoints of education about the environment (Palmer, 1998) which emphasizes awareness and knowledge about the environment. The practical perspective stressing social and cultural practices suggest (Mckernan, 2008) deliberation and practical reasons for the process of curriculum making. It considers deliberation in that recognizes the stake holders concern and needs. This view is related to education in or through the environment. Critical perspectives tend to capitalize emanupatory and

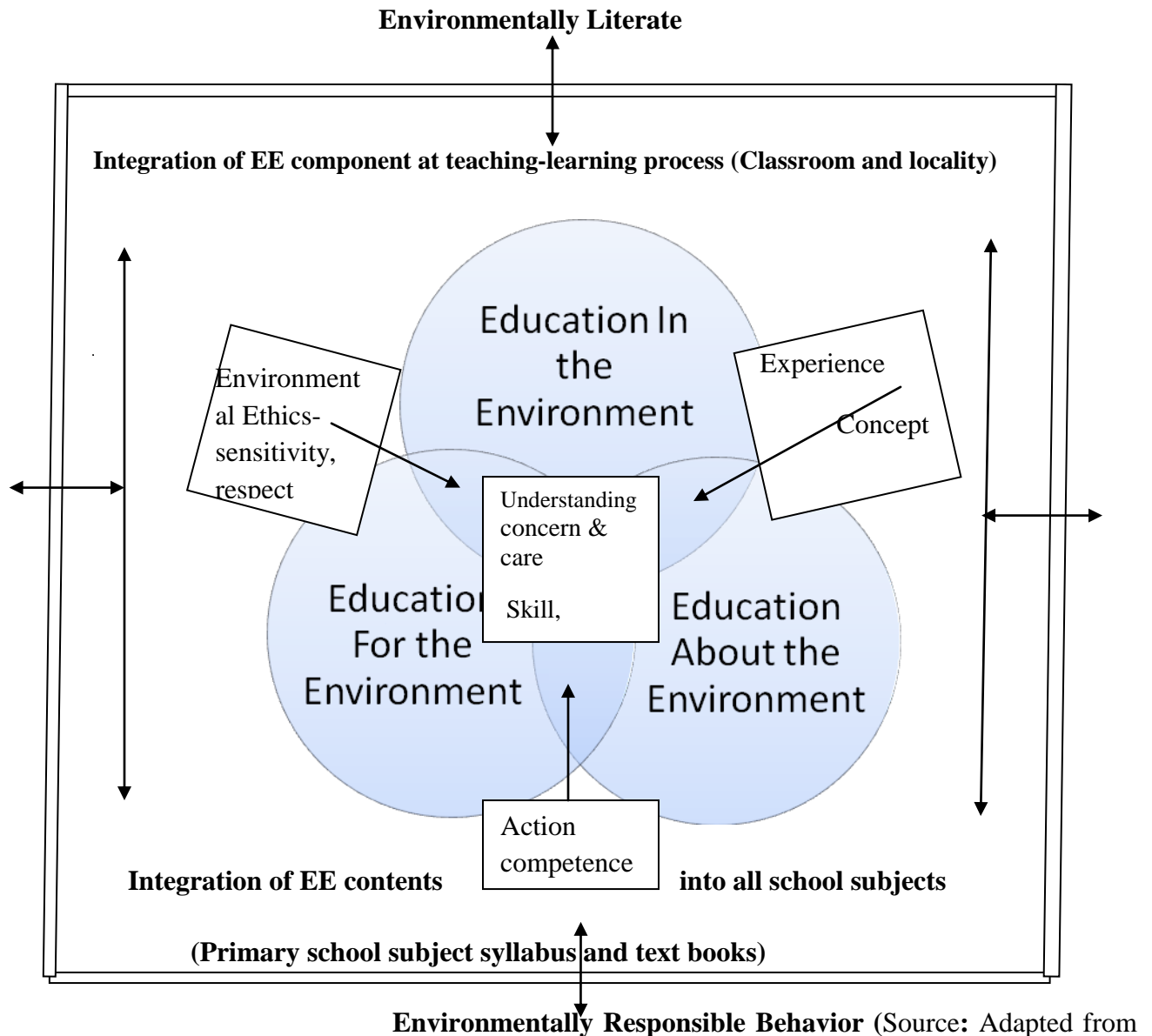
empowering role of education by allowing learning and developing knowledge through critical thinking and reflection. Thus, according to this perspective students are expected to develop understanding through critical thinking and reflection about their experiences and make decisions in the account of political, economic, cultural issues of the society. Education for the environment (Lee and Williams, 2001), view appears to share the perspectives of critical model.

In this connection of different ways of approaching EE inquiries and structuring it into educational systems at all levels have been identified. It has been claimed that linear model is applied (but inconsistently in environmental investigation and studies), yet challenged for being old and simplistic (Anja and Agyeman, 2002; Barr and Gilg, 2007). In contrast, perhaps due to the interdisciplinary and process of learning oriented character of EE, holistic and integrated model is perceived as appropriated for guiding EE curriculum making and teaching (Palmer, 1998; Fanzie Leopp, 1999). Cognizant of this fact in the context of the present study, the model initially devised by Lucas, (1979) later adapted by Palmer, (1998) which is termed as education about, in and for the environment (highlighted and related to curriculum development theories above) is considered. Moreover, ideas, principles and values received from other theoreticians have been used to supplement Palmer's model. Due to EE unique character, proper environmental understanding caring for and protection can not be attained through the deal of integration at curriculum, except further examining its integration in the teaching-learning phases including the local experiences.

Ideas borrowed like, 'humans' sense of place' (Butz and Eyles, 1997; Stevenson, 2007), environmental ethics-modern (Sauve, 1999; King-Tak, 2009; Ramanan, 2014), and local or indigenous environmental ethics (Workneh, 2001; Dixon and Wood, 2001; Teshome, 2013) and the like were drawn from these sources and integrated with the education about, in and for model to guide this study as conceptual framework. In similar token, it is noted that EE is of a learning process nature where as the integrated model-Education about, in, and for the environment model appear matching with the technical, practical and critical curriculum orientations trend respectively. However, the model and its integrating components are considered in balanced holistic or integrated way. The teaching-learning process aspect of the EE integration is expected to approach from teachers experiences, preparation, approaches (methods and perceptions) and these are implied and related to classroom and local issues as component or variable of the conceptual framework.

## 2.6. Conceptual Framework

The conceptual framework for this inquiry is built up of issues, ideas and concepts examined and identified from the literature reviewed. It is used to visualize the purpose, components and boundary of the problem under investigation. The purpose of the study is to explore how environmental education dimensions are integrated into primary school subjects and taught. To achieve this objective, the integrated model of environmental education of Palmer (1998:144) supplemented by ideas from other authors (Butz and Eyles, 1997; Ritta, 1998; Stvenson, 2011) are used. Within this framework, conceptual components such as understanding, concern and care (for natural environment and its elements) and, skill, as core target; and experience, action competence and environmental ethics-modern and customery at learning level are framed to be explored. Hence, these elements are used to recognize the integration of EE components into school curriculum at planning and pedagogical levels through integrating components of education *in, about* and *for* the environment. The reality of integration of environmental components into all subjects of primary school as planned and taught and learned are supposed to be accessed from curricular materials and lived experiences of curriculum practitioners and practices of primary school teachers. The modified model illustrating the above assumptions is presented in the following figure two. As I have mentioned earlier, the model is adapted and developed in modified way from different authors ideas mainly Palmer's (1998) and that of others (e.g. Ritta, 1998; Stvenson, 2011) to visualize and frame the key concepts and components involved and thereby guide the study.



**Figure 2:** Modified Model for Integration of Environmental Education into School Curriculum

The Palmer's environmental education model as mentioned earlier is designed as education about, in and for the environment. Most of the core elements defined by Palmer tend to emphasize cognitive dimension (e.g. among the five elements listed, Knowledge, Understanding and concepts are linked to thinking). This suggests education about the environment is more emphasized than education in/from (psychomotor) and for (affective) the environment. Perhaps this situation could be considered as one of the limitations of the model and further I could argue that perhaps the

weak attention given to education for the environment these days also may be related to this drawback. Moreover, the reason why the author presented another framework that incorporated experience, concern and action as additional elements to the previous model appear unclear. Consequently, developing a modified EE model by drawing on palmer's model and others scholars' ideas is logical.

Therefore, the proposed conceptual framework encompasses 'Education *in, about* and *for* the Environment' model. Jeronen and Kaikkonen (2002) forwarded similar idea supported by Capra (2007). These three components are expected to converge and operate together serving as an integrative tool. As illustrated in figure 2, at the heart of intersection of circles representing the three integrating components, core elements aimed at are outlined; these are understanding, concern, care, and skills. These can be considered as core environmental education goals that need to be achieved. Their explanation and interrelations will be clarified later on. The 'in', 'about' and 'for' components are framed as holistic approach to integration of EE components into the school curriculum. But at the instructional level they can be taken as stage of learning that moves from in/through-about/on-for the environment phases in the model. The reason behind this assumption is that feeling; thinking and action are expected to influence each other.

Hence, I suppose that one's interest and internal feeling can be enhanced most when based on authentic-direct experience. Afterwards the way of his/her thinking (understanding and mental set) and subsequent action (decision, intervention) that an individual or groups make would be influenced and affect each other. In this sense I believe that, if EE approach of primary school is guided by integration of environmental education components in all subjects and based on children's real experience and local context notably connect to the environment they may exert maximum mental effort for further learning. According to Bodzin, et al., (2010), direct experience from the environment is a necessary means for meaningful learning. Moreover, since the environment is everything and environmental problems and issues are complex, holistic or integrative approach to EE planning and teaching is more desirable currently because linear-discipline based approach seems obsolete to address such dynamic problems. Likewise, the elements set outside of intersection of the three circles (core elements) which are experience, concept, action competence, and environmental ethics are also expected to be incorporated but need emphasis at teaching-learning process.

Consistent with the interdependent feature of EE dimensions the present model suggests the integration of EE components to be made at different levels notably planning and teaching-learning. This assumption is justifiable by the fact that the contents of environmental education are emergent related to the cross-disciplinary character of EE. These levels of integration are illuminated in the model within the rectangular boundary, at the base; integration of EE contents in all subjects of primary school is outlined. In this regard the question is how far the present primary school subject textbooks incorporate environmental education contents. This is one of the questions that this study attempts to address. In this vein it is evident that integration of EE components that occur at learning or classroom level is most important for meaningful environmental learning, placed at the top of the model. Many reasons can be mentioned as to how this level of integration is crucial, for example one rational is teachers make the integration lively and practical through their long, intermediate and periodic lesson planning guided by curricular guides and materials. Another one is that teacher and students are usually considered as curricular makers at classroom level where their joint effort translate the designed curriculum into educational action. It is at this level, I suppose, that there are opportunities for relating to the real life experiences and incorporate relevant examples or contents from the local community. The continuous vertical arrows situated at right and left sides represent the interrelatedness of the two levels of integration of EE components, where the planned curriculum as incorporated and specified in the subject syllabus and textbooks serve as starting stage and expected to be developed, extended and modified flexibly at teaching-learning stage making the environmental learners at the center.

The model framed then, is expected to lead to environmentally literate individuals and environmentally responsible behavior thereby contribute to the attainment of quality life, protected and sustainable environment. The shorter arrows radiating out in all directions imply these intended outcomes. The three integrating components and corresponding concepts involved in the conceptual framework will be briefed for the purpose of emphasis.

## **Education in the Environment**

Education **in** the environment refers to using environment as a setting (stage) and resource for learning. It contributes to skills or competency development and comes under psychomotor domain. This model suggests learning based on real life experience and problems from the environment. Likewise, contents related to physical, biotic, environmental issues, functions, humans-nature interrelations, problems etc can be incorporated into different subjects of the school curriculum. Regarding approach, participatory learning, observational learning, hands on activities and outdoor learning/field studies are suggested to be applied. This level can contribute to the development of sensitivity to nature, understanding human-nature relationships and environmental issues and problems in learners. In this sense, I suppose that basing students' learning on the real life experience and context ('education **in** the environment') indispensably encourages sensitivity and awareness of environment in the students. There are reasons for this that may include: first, the more teaching-learning process is supported by the environment and made authentic, the more it becomes relevant and meaningful to the learners; second, primary school pupils relatively appear concrete learners(due to their developmental readiness stage) who may be benefited much from active and practical learning, and third, it is evident that children enter the learning situation with their own prior experience including the 'sense of place' (Butz and Eyles, 1997; Stevenson, 2011). A sense of place according to the authors entails belongingness and feeling of interconnection between persons and their environment as shaped by repeated encounter or lived experience and this will hopefully reinforce further learning.

In the same vein, sensitivity to nature/environment shows signifying positive feeling and relation to natural environment. Sensitivity to environment is stated by Hungerford and Volk, in Riitta (1998; 69) as profound personal meanings and strong positive emotion to environments and its components. In this connection sensitivity to nature includes aspects of respect, and love of nature, ability to recognize the changes in nature, an understanding of nature's holistic system, where all species are equally important and needed. Consistent to this, environmental ethics enhances respect, and love for environment or nature in individual that can contribute to the development of environmentally literate and responsible citizenry. Consequently, sensitivity to environment and environmental ethics can reinforce each other in pupils if integrated in holistic mode into environmental education and can contribute to the achievement of EE goals.

## **Education about Environment**

This component aims at developing understanding (knowledge) about environment, relationship of humans and environment, environmental issues and problems etc. It emphasizes cognitive domain; and in the process, appropriate technical and intellectual skills about the environment and related issues. In the learning process experience, concepts, issues and problem situated approach is expected to be focused on. It is worth noting here that emphasizing on environmental knowledge (education about the environment) assumptions could not lead to proper environmental awareness and skill development (Palmer, 1998) as expected. This partly implies the priority given to knowledge as contrasted to skill and attitude, but knowledge creation did not guarantee the development of positive value system toward the environment and taking action to solve environmental problems so far. In line with this, Capra (2007) notes that increase in knowledge could not necessarily lead to action taking. Therefore, deep conceptual understanding of environmental matters and human-natural environmental relationship as well as related problems need be refocused as indicated in the model.

*Understanding* can be seen as identifying and internalizing in an in-depth way, the environmental concepts, issues and problems and human-environment relationship as well as causes and remediations to those problems. Moreover, critical analysis and identification of the complex systems of the earth: environment, socio-economic and human-nature interrelationships etc can be considered as aspect of environmental understanding. In this regard Bodzin et al. (2010) advocate for deep understanding of the earth, its systems and their interrelationships that importantly fostered through direct experience in the environment.

## **Education for the Environment**

Education for the environment appear the highest stage that aims at the developing informed values about the nature/environment and positive attitude toward the environment, human-nature harmony and related dimensions which may affect behaviors or actions. Action competence and Environmental ethics, and respect for nature/environment and for humans will be considered at this phase of learning process. Here students are expected to involve in environmental deep learning that enable them build their knowledge about the environment, environmental issues and problems, and humans-environment interaction. Based on this they need to strive for the development of positive and responsible action at individual and collective level towards

environment and resource utilization, humans-nature interaction and with each other. In this connection, concern and care are important concepts related to education for the environment component of the model; which is further crucial for the development of sound environmental literacy and responsible behavior. These concepts are interrelated, nonetheless differ in emphasis. *Concern*, in particular, refers to strong feeling of importance, and interest in earth's environment for it is vital to humans' welfare and other livingthings. *Care* may be perceived in context of protecting natural environment. It may refer to protective attention, proper caution and conservation, as well as preservation base on context while interacting with and using natural environment and its resources.

Moreover, the situations of this century urge us to consider critical thinking as one of the higher order learning ability to aim at in environmental learning. In this regard it could be argued that creative thinking and critical thinking are essential to understand and identify the complex systems of environment, ecosystems, economic and socio-political including how they operates; thereby can help learners to make responsible environmental decisions or responsible actions for environmental care, protection and sustainability. Supporting this view, it is claimed (Mogensen and Karesten, 2010:61:62) that critical ability should be developed in learners to enable them differentiate controversial and hidden agenda that may encounter them while dealing with EE and ESD issues, and environmental problems

Even though discussed separately and seen as stages of learning, the three components of education in, about and for the environment are expected to be handled in integrated way. Sensitivity, understanding, attitude and competence are fixed as key goals at the intersection of the components represented by circle at the center. In light of these targets, in the learning process it is suggested to focus on experience, concepts, action competence and environmental ethics and respect as indicated in the outer part of central circle of the model. Then it is assumed that if these components are used to integrate EE into school curriculum and the highlighted elements are emphasized in the teaching-learning process, hopefully environmentally literate and responsible citizenry who can contribute to the goal of environmental care and protection, attainment of quality life and sustainable future will be developed. Environmental literacy in this context can be conceived as a culturally specific body of knowledge that fosters particular ways of thinking and acting in the world, and it is claimed that the ultimate goal of environmental education is the development of an environmentally literate citizenry (Cole, 2007). Thus, profound knowledge, deep positive emotion, sound moral and belief principles about environmental systems,

environmental issues and problems is expected to occur if environmental literacy is to be reached. The concepts and issues designed as components of conceptual framework would be supported by research approaches and methods to guide the study. The next chapter presents research design and methodology.

## **Chapter Three: Research Design and Methodology**

This study aimed at exploring and describing the integration of environmental education components into the Ethiopian primary school curriculum focusing on Jimma zone. The inquiry is confined to primary school subject syllabi and textbooks, and some primary schools found in Jimma zone. This Chapter presents the design, sources of evidence, and instruments of data collection as well as methods of data analysis.

### **3.1. Research Design and Procedures**

To understand the integration of environmental education contents and issues into primary school curriculum, the process of inquiry has been chosen to be interpretive paradigm-constructivist perspective (Stake, 1995; Merriam, 1998; Denzin and Lincoln, 2013). Consistent to this world view (which is based on the belief of existence of multiple realities and relativity of the knowledge gaining process) I have used qualitative research approach. Stake (1995) and Merriam (1998) in similar ways hold epistemological view that explains qualitative researchers should be guided by constructivists' ways of knowing and meaning making. Stake asserts that "knowledge is constructed rather than discovered"; while Merriam argues that, "reality is constructed by individuals interacting with their social world in the process of qualitative research". Therefore, constructivist's theory could lead the present study and enabled me understanding the integration of environmental education components into primary school curricula as analyzed from textbooks and syllabi and participants involved in the development (curriculum officials and experts) and implementation (teachers) of the curricula.

In this connection, it would be worth noting about the notion of qualitative method as it differs from quantitative research approach. Drawing on the observation of Denzin and Lincoln (2000) and Florian (2006), claims that qualitative research underlines the qualities of entities, processes, and meanings involved in the enquiry that do not suit experimental scrutiny or measured in terms of quantity, amount, intensity or frequency. The present study specifically followed the qualitative case study approach triangulated and embedded with in the qualitative content analysis (Mayring 2000a and b, 2002; Kohlbacher, 2006; Creswell, 2007). Qualitative research method enables studying things or phenomena in their natural setting/context, where one could make sense of or interpret phenomena in terms of the meanings people bring to them (Denzin and Lincoln (2005) in

Creswell, 2007; Hancock and Algozzine, 2004). For example, exploring what teachers or curricular workers express or say about EE helped me secure evidence how they conceive integration of EE into school subjects and further identify the rationale for their practice. Importantly, here reality is internally constructed; indeed, self created and co-constructed; based on individual's subjective knowing and interpretation and from documents (Guba, 1996; Denzin and Lincoln, 2013).

According to Denzin and Lincoln (2013), co-construction of reality meant what is real, useful and meaningful are derived from community (participants and investigator) consensus especially meaning for action and further steps within that community rather than relying on the criteria of judging reality, validity or absolutist dealings. In this respect, it is imperative that the elements emphasized in the conceptual framework integrative components- education *about*, *in*, and *for* the environment could be understood using constructivist lens. Consistent with constructivist view, ecological perspective, denotes that we can access information from our environment with our own individual or group perceptual systems, which converges with internally constructed (individually and in group) reality notion of constructivists' perspective (Palmer, 1998; Tilbury, 1996).

Then, due to the interdisciplinary nature of EE (e.g. it characterizes a learning process), qualitative case study method with qualitative content analysis embedded was used in this study. The case study method is preferred because of ecological dissimilarity and the presumed decentralized curriculum.

### **3.1.1. Qualitative Case Study**

This study is guided by the principles of qualitative case study. According to Pattoo and Appelbaum (2003) cited in Florian (2006), case studies offer the opportunity for a holistic view of a process. It is evident that questions requiring an intensive and in-depth description of some social phenomena along with the intent of multiple interpretations of reality, knowledge construction are claimed to be appropriate to case study strategy (Stake, 1995; Merriam, 1998; Hartey, 1994, 2004; Yin, 2009, 2011; Bryman, 2012). Drawings on literature review of Florian (2006), both the strong and weak aspects of case study have been identified. Hence, the author claimed that the basic strength of case study data collection is the opportunity it gives to use many different sources of evidence. Case Study is used to gain a deeper understanding about participants' attitude, behavior, and expectation; and connect a phenomenon to life or social context. Moreover, it enables the

researcher to capture the holistic and meaningful characteristics of real life events pertaining to organization, managerial processes, school performance, etc. (Hentz, 2007 in Yin, 2009). In this sense the integration of environmental education components and issues into the primary school subjects as perceived and practiced by teachers of this level selected from Jimma zone was explored and understood.

Jimma zone is situated relatively in the rainy-(south-western) part of Ethiopia. Jimma Zone has been selected to include teachers teaching in different primary schools from urban and rural settings. This is because Jimma Zone is found to the south western part of Ethiopia (one of the 20 zones of Oromia Regional State) which is the part of relatively rainy and remains of forest cover area. In addition to these environmental features (which are of concern both at regional and federal level), accessibility of the study sites in the eye of my home university and hosting university location convinced me to include primary schools from Jimma zone. Consequently, a single-case embedded study design has been used. This design is one of the four types of case study design constructed by Yin-(single case holistic, single case embedded, multiple case holistic and multiple case embedded design); and entails an enquiry focusing on single case having different elements (Yin, 2003, 2009). Accordingly, four primary schools from Jimma zone have been identified and selected (using purposive sampling) as research sites to study the problem in depth. I selected teachers from four primary school having urban and rural characters. Four primary schools were believed to be enough given indepth and thorough analysis and triangulation making. Bryman (2012), consistent to this idea, underscores that the basic case involves the detailed and intensive analysis of a single case; where the case is intended to serve as instrumental to explore and understand the phenomenon being studied.

Pertaining to integration of environmental education components into primary school subjects, the perception and the experience of teachers of the schools selected could be explored and understood via embedded single case study design. Four primary schools-two with urban feature and two from rural centers have been considered as a case within the zone. Apparently it was to examine whether environment was used as context while teaching EE components in primary school curriculum at schools of different character. Moreover it was intended to analyze how the centrally designed EE incorporating syllabi but only adapted by regions are understood and taught at schools levels of different areas. Including schools from the two areas might illuminate how environmental learning

opportunities were created both at urban and rural area schools. Perhaps, Jimma could ‘exemplify’ (Yin 2009: 48), the green areas of the southwestern part of Ethiopia-where at the same time the rate of degradation is rapidly increasing. The notion of exemplification accordingly implies that cases are often chosen not because they are extreme or unusual in some way but because either they characterize a broader category of cases or they will provide a suitable context for certain research questions to be answered(Yin 2009: 48).

### **3.1.2. Qualitative Content Analysis**

I have attempted to triangulate the evidence obtained from interview participants with the data emerged from curricular document using qualitative content analysis with case study method. In order to understand how environmental education components are incorporated into the primary school subjects and taught, I have examined the syllabi and textbooks (see 3.2: Data Sources) of the primary school level via qualitative content analysis. Qualitative content analysis is a recent trend as compared to quantitative content analysis of which Berelson (1952) takes notable recognition (Kohlbacher, 2006; Bryman, 2012). It is boldly argued that the inductive type (qualitative) content analysis of document or text data has emerged out of critics undergone against quantitative content analysis questioning its viability to inquiries seeking understanding the meaning of connotations, patterns, wholeness etc. rather than counting and measuring. This entails that there are issues in social studies context that cannot be reduced to numbers or measurable units, including contents of curricular document such as textbook. Consequently, it is imperative that qualitative content analysis is appropriate to address the present study objectives.

In this connection qualitative content analysis is believed to be as one of the approaches that allows the investigator to construct the meaning from text evidence, with an emphasis on categories to emerge out of data and recognizing the significance for understanding the meaning of the context in which an item is being analyzed (Bryman, 2004; Kohlbacher, 2006). Similar assertions were made by Hsieh and Shannon (2005) where, they claimed that qualitative content analysis is one of the research methods used to analyze text data in a holistic and comprehensive way and examine the materials, complex social situations and social data involved in the study. The procedures of summary, explication and structuring step-by-step reduce complexity and filter out the main points of analysis in an iterative process. Therefore, qualitative content analysis

perfectly fits the principle of case study research: helping to understand complex social phenomena, where both the manifest and the latent message of the material could be importantly considered.

Justification for using qualitative content analysis is explained by my interest to explore the components of environmental learning integrated into primary school subjects and the underlying implication. I am convinced that this can best be served by analyzing and assessing textbook which is commonly accessible both to students and teachers as developed by experts. To this end, different researchers claim that qualitative content analysis appears feasible when new theories are sought for or new interpretations are required, and/or when much is not known about the phenomena to be studied, (Lauri and Kyngas, 2005 in Kohlbacher, 2006; Hsieh and Shannon, 2005). It is also asserted that the application of this method involves breaking down the data into smaller units, coding and naming the unit according to the content they represent and grouping coded material based on shared concepts. Importantly, qualitative content analysis can be used with other forms of data analysis method (Hsieh and Shannon, 2005) that are more inductive and sensitive to emergent categories and interpretations, hence, can be used within case study strategy. Moreover, studies reveal that a researcher can select the content s/he analyzes on the basis of her/his research objectives and research questions (Robson, 1993 in Hsieh and Shannon, 2005). Hence, how EE contents and issues are integrated into primary schools subjects and taught (focusing on some schools in Jimma zone) could be examined and understood using qualitative content analysis method.

### **3.1.3. The Study Site**

Jimma Zone is located in the Southwestern part of Ethiopia between Latitude  $6^{\circ}$  and  $9^{\circ}$  North and Longitude  $34^{\circ}$  and  $38^{\circ}$  East, and between altitude ranges of 880 to over 2300 meters above sea level (Oromia Regional Government (ORG), 2003). Jimma is one of the zones of the Oromia Regional States of Ethiopia named for the former Kingdom of Jimma, which was absorbed into the previous province of Kaffa in 1932 ([https://en.wikipedia.org/wiki/Jimma\\_Zone](https://en.wikipedia.org/wiki/Jimma_Zone)). According to the same source, Jimma is bordered on the south by the Southern Nations, Nationalities and Peoples Region, on the northwest by Illubabor Zone, on the north by East Welega Zone, and on the northeast by South-West Shewa Zone; part of the boundary with South-West Shewa is defined by the Gibe River. The highest point in this zone is Mount Maigudo (2,386 m above sea level).

As noted from the 2007 CSA report, the total population of Jimma Zone was 2,486, 155 with the population density of 159.69 persons/ km<sup>2</sup>. The three largest ethnic groups residing the Zone were Oromo (87.6%), the Amhara (4.05%), and Yem (3.12%) and all other ethnic group combined made up 5.23% of the total population (Ibid).

Jimma Zone is one of the areas with “few remaining natural forest in Ethiopia” (Kitessa, 2007), rainy region, with varied relief and bounded by different rivers. Thus, the Zone is characterized by peculiar environmental feature. The zone lies in the moist part of Ethiopia, receiving “mean annual rainfall that range between 1800mm to 2300mm; where approximately 60-65 % of the total rainfall of the zone occurs during the wet season lasting from May to September. On the other hand December, January, and February are the driest months with rainfall less than 100mm (ADF, nd). Similarly, its’ annual mean temperature is between 15<sup>0</sup> c and 22<sup>0</sup> c (EMA, 1988, in Kitessa, 2007).

As the temperature cited above suggests, the Zone is part of highlands with associated low area. Consistent to this assertion, an article provided by Oromia National Regional State (ONRS), (2011) describes that Jimma highland is part of Western plateau connected to south eastern East Wellega highland, and bounded by Anger-Didessa low lands to the north, upper Gibe valley to the east, Gojeb to the south and Didessa valley to the west. In other words, the zone is encircled by important rivers mentioned above and their feeder streams. With the same vein it is contented that though Jimma experiences wet climatic condition and relatively covered with few remaining natural vegetation including forest, as reported by many(e.g. Kitessa) and witnessed by me, the forest is under great threat due to overexploitation, and investment activities like coffee and tea plantations. Thus, this and similar concerns, if considered and used as integrative context for environmental learning and refocused in studies like this one, at least may attract the attentions of the actors to think toward the improvement of the environment.

Finally, it is worth noting that primary school curricula that incorporate EE components (Centrally designed and regionally adapted) and assumed to contextualize the Regional and the schools realities of the study site, also involves ecological attributes (e.g. wet climate and forest cover) having importance at both regional and national levels

### **3.2. Data Sources and Selection Techniques**

It is evident that trustworthy data is essential for addressing a research problem. This in turn requires identifying relevant sources of data. Accordingly, primary data was gathered from curriculum officials and experts (of both federal and regional levels), while the secondary data was secured from primary school curricular documents notably textbooks and subject syllabi. Regarding the selection criteria of primary data sources, curriculum officials and experts were selected on the basis of the position each holds related to the stream or departments they work for. Curriculum experts' views and experiences were sought for as they are important evidence for understanding the integration of EE into primary school subjects. The views and opinions of the curriculum experts were meant to triangulate the evidence obtained from curricular documents specifically textbooks sizeable of 16. Similarly, 22 (for details see annex 2 two page 232) teachers of primary school were selected using purposive sampling approach from the four schools. This is because of the following reasons. Location and direction in terms of the moist and natural forest coverage among others were considered for identifying the schools. Primarily the numbers of teachers was sought to correspond to the number of the textbooks mentioned earlier but due to the increment of sections of grade levels in some schools (e.g. Mendera) to represent teachers, the number of participating teachers inevitably increased to 22. Schools have been restricted 4, because qualitative study needs intensive and in-depth study that demands more effort, resource and time as compared to quantitative research. In this regard, many research thinkers (e.g. Ezzy, 2002; Polking, 1989 in Creswell, 2007) claim that in qualitative research purposive sampling can be used to include participants ranging 5-25 who have experiences about the issue or phenomenon under study.

In addition to my research interest to understand the extent to which the natural environment components (e.g. biophysical aspect) are used as learning context at the site; other attracting forces toward schools situated in this part include: firstly, the prevalence of the remains of natural forest cover in the area but still diminishes at increasing rate. Secondly, the achievement of environmental education objectives does not rely only on the integration of environmental contents at curriculum level but also requires integration of environmental learning from the locality in this case relatively green area, (though degrading) deserve attention. Thirdly, the findings of the present study is expected to contribute to the development of proper understanding of the environment and responsible behavior towards to humans environment relationship and there serve as exemplary for other parts of the Country. Furthermore, I noticed that of the deteriorated

vegetation cover of Ethiopia, the meagerly remaining forest cover (estimated to be 2.2% as reported by Aynalem (2006) cited in Oromia National Regional State 2011), is relatively evident in the southwestern part of the country where Jimma Zone of Oromia Regional State is located. That is why the four primary schools (from Jimma Zone) were selected purposively. Furthermore, accessibility in terms of cost, time and transport infrastructure is another reason. For instance, proximity can promote frequent observation and in-depth investigation which contributes to the credibility of the research. In connection to this Creswell, (2007) writes in qualitative study, the researcher can select participants based on the objective of the study and his/her knowledge of the study context.

Teachers were selected on the basis of the subject they teach, years of work experience, and current roles as well as gender. Hence, I have consulted teachers of different subjects, varied years of experience and both gender to explore dependable data. These attributes of participants are considered because they are expected to influence teachers understanding and attitude toward the integration of environmental education as well as their actual teaching effort in their subject matter. The names used in the interview data are pseudonyms to keep the confidentiality of the information the participants provided me. For triangulation purposes; information from curriculum experts at Federal level (6) and those of Regional level (4) were also included into the study.

In similar fashion, primary school textbooks (centrally designed and adapted by Oromia Education Bureau-OEB) have been identified as basic sources of data to examine the ways and extent of integration of EE contents. In this regard, Babbie (19980 in Ulin et al. (2005) state that in communication research the focus is on who says what, to whom, how and with what effect. This suggests that content analysis attempts to answer the question- what is being expressed and how it is being said in a given medium. Textbooks which serve as medium carrying and conveying education message primarily to students and teachers are important source of evidence in the present study. Textbook is emphasized here, because it is equally accessible to the first line stakeholders of curriculum (learners and teachers); and at the same time textbook is one of the important learning resource with which the learner interacts. Thus, through analysis of the primary school textbooks, I investigated and understood the extent to which environmental education contents are covered, the intent anticipated and the implication underlying in the lens of education about, in and for the environment as well as some national educational principles. In this respect, it is worth noting that currently in Ethiopia primary education syllabus are designed at national

level, and regional states receive and adapt to their context. According to one of the curriculum experts from Federal Ministry of Education, “regional states based on the syllabus prepared at national level (with specified objectives (competency), contents, learning activities, and assessment strategies) can translate textbook to their contexts”. The regions maintaining what has been centrally designed can enrich the curriculum by translating into local languages and add examples from their locality. Consequently, the textbooks were identified using purposive sampling. The sampling was based on categories of streams of subjects by cycle whereby 1-4, subject textbooks were categorized as language (A.O, English) environmental Science, Mathematics, and Aesthetic. Of these, Afan Oromo and Environmental science textbooks of three grades (2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup>) have been selected. Mathematics textbooks of grade two and four, and grades two English were purposively identified and included in the study sample.

Similarly, textbooks of Grades 5-8, were grouped as language (Amharic, Afan Oromo, English), Social Science (social studies and civic education), Natural Science (integrated science and chemistry, biology. Physics and mathematics) and Aesthetics (sport, drawing, music...). Thus, Afan Oromo, social studies integrated science; and Biology subject textbooks were selected as the source of evidence. In this cycle, again English textbook of grade five, mathematic text of grade six were added for triangulation. Hence, in this study a total of 16 textbooks have been identified and reviewed. Syllabi and teachers guides have randomly been selected for cross accounting. Category representation and purposive sampling used here is to maintain the inclusion of different stream areas and make data source manageable. In this connection, Kohlbacher (2006) reminds us that in content analysis sample should be representative of the universe, but non probability or judgment approach can be used when the document appears too large to be analyzed in entirety.

### **3.3. Data Collection**

Three major tools of data gathering have been used for this study. They included document analysis guide, semi structured interview guide and lesson observation guide. The instruments are appropriate for collecting qualitative evidence pertinent to the research objective. The assertions of some research experts (e.g. Bryman, 2012; Creswell, 2007) confirm applicability of these tools to qualitative studies among which case study is included. According to these authors, data can be gathered from participants experiencing the phenomena using in depth interview, multiple interview, observation, recording, etc. In the same vein, Stake (1995); Merriam (1998); and Yin

(2009) among others suggest interview, direct observation and document analysis to be used for data gathering in the case study research.

### **Document Analysis**

When document content review is employed as a tool in qualitative studies, current documents and issues are the foci. Thus, contents of the primary school textbooks currently functioning at schools were reviewed to examine and how and the extent of integration of EE contents and issues in these subject texts. Multiple unit of analysis for example contents ranging of the entire textbook, chapters, sections, paragraphs, sentences to words have been considered. In this regard, it is stated that (Hancock and Algzzine, 2006) unit of analysis in content analysis of case study could vary from words, themes, characters, paragraphs, items, concepts, to semantics issues. Amare (2000) and Tesfaye (2011) have used similar approach in the identification of unit of analysis. Consequently, textbook content analysis were employed to investigate how and the extent EE topics, contents, issues and problems as wells semantic implication incorporated in the textbooks are identified in the lights of conceptual framework components set.

I followed the analysis of textbook contents after textbook were read repeatedly word by word, line by line while looking for environmental learning area components including natural environmental elements(topics, contents, problems issues...), environmental messages(manifest and latent meaning implicated) and missed as well as emergent issues. Open approach to content data identification and recording were made flexibly (Elo and Kyngas, 2007; Bryman, 2012) in an ongoing manner to attain the research objectives. Supplementary to the open approach to content data identification, I considered the suggestions of Hsiu-Fang Hsieh and Sarah E. Shannon (2005) who outlined three ways of content analysis namely-conventional, directed and summative ways of analyzing text data. Of these, I partly considered the procedure they indicated under summative approach which allows the investigator to look for text data, often key words, and contents from the source and use of theory informed coding of the analysis process. Accordingly, the analysis of the curricular document notably textbook involved looking mainly for natural environment pertinent topics, contents, issues and messages in the textbooks and related components, as well as interpretation of the underlying context.

### **Interview:**

I have used interview to obtain evidence from curriculum experts of different subjects working at Federal Ministry and Oromia Education Bureau about the integration of environmental education components into primary school curriculum. At the same time, interview was used to gather data from 22 teachers of the four primary schools of the study site to understand their perception, experience and practice pertaining to the integration of EE contents while teaching their respective school subjects.

The data collection procedure started after two actions had been accomplished: data gathering instrument (interview guide, and classroom observation schedule), preparation and receiving a clearance letter of recommendation for the research that would be submitted to the study area educational offices and schools. To explore teacher inner feelings and experience regarding the integration of EE into the primary school curriculum, interview of semi-structured type was used in this study. Because, semi structured interviews (Hancock and Algozzine 2004) are perceived as important instrument for case study research allowing the researcher to pose predetermined but flexibly worded question, interestingly inviting participants to express themselves openly and freely from their perspectives Creswell (2007:95) also appears supportive of this proposition. The interview questions are developed by me on the bases of aims and basic questions of the study as well as underpinning ideas and concepts derived from the literature.

As a direct and face-to-face means of communication, interview held at the naturalistic setting (Angen, 2000 in Creswell, 2007), is an appropriate tool for understanding participants' perception and thinking about integrating environmental learning components and issues in different primary school subjects. It also helps revealing the latent meaning implied and the context in which they are operating. According to O'Donoghue and Punch (2003:116), interviews enable the investigators to explore and understand the complex issues and behaviors; allow participants to speak in their own voice; and uncover the subjective meaning the participants' accord to the phenomenon of investigation. Yet, it is also contended that problem of controlling and directing a range of diverse issues emerging from different interviews is among many of its limitations (ibid). It is suggested that, in order to overcome such drawbacks, the researchers are expected to specify explicitly procedures of data gathering phases and use more than one method of data gathering.

## **Interview procedures**

Data gathering and analysis process proceeded by initial visit to the study site in December, 2015 and has been carried out up to 2016/17. The data gathering process followed three phases to collect relevant data from participants. In phases I, interview was held with all the target participants (curriculum experts, 6 from federal-MoE and 4 from the study region-OREB, and 22 primary school teachers), during phase II while analyzing the data obtained from first stage interview, classroom observations have been executed. Phase III, encompassed second in-depth interview with selected participants for securing more refined and authentic evidence.

I have prepared the interview guide primarily in English and gave to research experts for comments before using it with participants. Then, the improved English version has been employed to communicate with both federal level and regional level curriculum experts in one-on-one (Creswell, 2012:218) basis about the integration of EE components into primary school curriculum. The participants were involved in the interview conversation based on their consent and interest. Moreover, letter of recommendation was granted from the Addis Ababa University that requests the necessary help the study demands. The place and time of the interview have been arranged with each expert, and the interview held at the participants' convenient time and space, for 30 to 40 minute per interviewee. Each interview has been audio recorded and supplemented with note taking.

On the other hand, the primary school teachers involved in the study were identified purposively after I have received formal permission from the Jimma Zone education office and corresponding four wereda education offices (namely, Dedo, Gerra, Jimma town, Seka-Chekorsa), where the selected schools are located. For this purpose, English version interview guide was translated into Afan Oromo for primary school teachers where I consulted colleagues specialized in Afan Oromo for professional help. This is because the medium of instruction of primary school of Oromia is Afan Oromo. As a result teachers can express themselves more perfectly with the language they are teaching, perhaps that could be their mother tongue. Furthermore, I found it helpful to obtain more context specific evidences. As cited earlier, semi structured interviews was held with all primary school teacher participants in one-on-one basis in their schools at place (where) each prefer for 30 to 40 minutes per interviewee and tape recorded in addition to note taking. Cognizant of the emerging nature of qualitative research, data obtained from the first interview has been analyzed; in order to make decision for further data collection procedures and to identify missing

elements and focusing point for obtaining evidence that can answer the research questions posed. Then in-depth interview was made with four teacher participants according to their understanding and experience as noticed from the first phase interview. The in-depth interviews intended at sound insider feeling, conception and experience about the EE components and issues integration into school curricula.

### **Observation:**

For an inquiry of integration of environmental education in the subject areas of primary education of Ethiopia, classroom observation is appropriate method to understand how teachers strive to teach EE contents as integrated component in their actual teaching practice. In this regard (Best and Kahn, 2004) explain that, the data from observations consist of detailed descriptions of people's activities, action, and the full range of interpersonal interactions and organizational processes that are part of observable human experience. Of different types of observation such as participant observation, complete observation, open observation or unstructured observation (Merriam, 1998; Yin, 2009) I used open or unstructured observation to identify how primary school teachers are teaching EE contents and issues in their subjects and connect to environment in the learning context. Unstructured observation(see appendix 1, B, p.231), enabled me to note down all teaching-learning aspects of EE and associated events occurring as well as expected but missed ones during class transaction and holistic school scene observation.

Observation in this sense is seen as method that involves obtaining information directly from the natural setting of a phenomenon in a planned way. Observation is claimed to be suitable for the study of social or behavioral phenomenon (Flick, et al, 2004). As a tool of data collection, observation possesses both advantages and disadvantages that researchers need to make note of while employing it. Some of its advantages may include: First, it can enable the researcher to note down what s/he sees as it occurs or enables to secure fresh and authentic data from its natural setting. Second, the data obtained through observation could illuminate what is currently happening and remains un-interfered from past behaviors or future intentions. Third, it can be used to confirm or supplement information obtained from other sources. On the other hand, observation method encompasses limitations such as doing observation is criticized for being expensive and time taking, the limited information it supplies and possibility of interference of unforeseen factors with the observational tasks (Flick, et al 2004:58-59; Sapsford and Victor, 2006:96-98).

Thus, to capture first hand evidence regarding the integration of EE components into primary school subjects open observation is appropriate tool. Furthermore, it opens ways for comparing what teacher says and actually practicing during the teaching processes. The lesson observation schedule was fixed in consultation with school administrators and subject teachers, whereby five lessons have been observed based on gender and subject variation as well as permission of teachers. My role as investigator was non-participant or complete observer that involved attentively observing the process (Best and Kahn, 2004; Creswell, 2012) of the lesson and make a written account of all what occurred during the teaching-learning process, including the remark making of the non-occurring events. The classroom observation was followed by short post observation discussion with the teacher for reflecting on how and the extent of integration of EE components in his/her teaching.

### **3.4. Data Analysis**

In this study, the data collected through content analysis of documents, interview and lesson observation are transformed to qualitative data analysis approach in an ongoing and emergent manner. For Merriam (1998:178) data analysis is the process of making sense out of the data which entails consolidating, reducing, and interpreting what people have said and what the researcher has seen and read. Others (e.g. Best and Kahn, 2004 and Elo and Kyngas, 2007) suggest procedures of qualitative data analysis; the former authors specify steps involving organizing, describing, and interpreting evidence, while the latter outline:preparation, organizing, and reporting phases with detail steps that encompass, selection of unit of analysis--making sense of data--open coding--grouping or categorizing—abstracting conceptual category. Open coding in this case refers to writing notes and headings in ongoing manner while reading the text. Consistent to the above notion abstracting/abstraction is meant formulation of a general description of the research topic through generating categories. Hancock and Algzine (2006) on their part delivered working steps of data analysis in case study research that follow, reviewing, coding, categorizing, synthesizing, and interpreting the data obtained from the data sources. In this sense we can think of EE topic, content and message of primary school subject textbooks and interview evidence or information can be analyzed considering the suggested processures.

Thus, in the process of this data analysis, I have tried to consider the steps suggested by different qualitative research methodologists in integrative and flexible ways. Herein, as support to my

view, Stake (1995:77) and Ahuvia, Aaron (2001) state that a researcher, based on his/her experience and reflection, can find the forms of analysis that serve his/her research purposes. Particularly, Ahuvia Aaron stressed that, in interpretive content analysis the process of coding should be flexible and context responsive, where credibility can be attained more by public justifiability rather than inter coder agreement. Consequently, the evidences obtained have been analyzed inductively cognizant of sources consulted and tools used, and the corresponding research questions each intended to address.

I started the analysis of curricular document data by reviewing (Hancock and Algzzine, 2006) and making sense of the data textbook by textbook; further reviewing (Cresswell, 2007) to mine the text data elements related to the environmental education contents. The reviewing was pursued to identify and understand how and to what extent these contents (more importantly, the natural aspects of the environment) are covered in primary school subjects. Then, I used a mixed approach in the coding process, that is open coding (to identify manifest and latent meaning and/or contents) and focused coding (to consider natural environmental dimension) coding, where the manually coded data were grouped and synthesized into meaning units. The meaning units or segments of the evidence are further refined into textual explanation of the data or interpretation of result. This data analysis type is expected to address research question one and its subquestions. Therefore, the extent and how EE dimensions are integrated into the primary school subjects have been identified from textbook content analysis through the lenses of the three integrative EE components (Education About, In, For Environment) and national curriculum framework(K-12 Curriculum Framework) and education and training policy directives; yet without overlooking the implications emerged. Likewise, relevant data obtained from interview and classroom observation were used along this result for triangulation.

In the same vein, the interview data obtained from 10 curriculum experts and 22 primary school teachers were analyzed person by person seeking the meaning and pattern in terms of the study objectives. I began the analysis by repeatedly listening to the audio recorded interview information and also reviewing the field note taken to make sense of the evidence. Afterwards, I continued transcribing and describing in an in-depth manner what the interviewee said and the implication or meaning underlying their interview communication. Along this line of assertion, Ezzy (2002:70-71) claims that in interpretive process, qualitative data is not found but made and actively

constructed through social processes; and further suggested transcribing, reading and coding early data in the process of qualitative data analysis. This level of analysis focused on describing and coding to identify keywords, concepts, and meaning statements into categories or theme in the light of research questions and the integrative environmental education component framework. The data analysis approach was (partly) supplemented with qualitative data analyzing software version open code 4.2. The Afan Oromo version data, obtained from teachers were primarily transcribed, translated to English by the investigator, and exposed to comments of a language and a curriculum professional; and their comments seriously considered prior to analysis. Teachers' conception, attitude and practices of integrating environmental contents and issues into their respective subjects were examined to draw meaning in terms of the research questions set.

Likewise, classroom observation evidences were analyzed in depth by reviewing note taken and understanding emerged during lesson observation and information obtained from post lesson observation discussion. It was reflected on and interpreted the used to supplement the evidences secured through document analysis and interview conversations. The analysis result of interview and lesson observation evidences triangulating curricular document content analysis, are intended to address all the research questions. More specifically, the interview data analysis result supplementing the content analysis finding addresses the first research question and its sub-questions. The second research questions and its parts were answered using the integration of the lesson observation data analysis and teachers interview data analysis results.

In conclusion, through description and interpretations, meaning statements, and textual description were expanded to construct narration of the essence of the integration of EE and sustainability into primary school subjects in different ways as understood in the lens of environmental education integrative model and some education and training principles framework.

### **3.5. Ethical Consideration and Validation**

Throughout the process of the research I have strictly been committed to maintain the research ethical principles. Accordingly, to achieve this first attempt have been made to make the research methods and procedures systematic, detail and clear; so as the research process and result became trustworthy. Furthermore, prior to fieldwork phase a formal letter of clearance and recommendation has been granted from my University (AAU) that testifies the purpose of the research to concerned bodies. Consequently, different institutions and participants had been well

informed about my research topic and its objectives both from the letter mentioned, my briefing and data gathering tools before involving in the study.

Most importantly, special consideration was placed on respecting and protecting the rights of participants where they were asked to involve based on their free consent. In this case I considered Denzin and Lincoln (2013:135-136) suggestion that reads research participants' rights should be honored and properly respected ...human freedom must be manifested while they are involving in research activities. The credibility/reliability of the evidences of the study had been evaluated in an ongoing manner throughout the design, emerging process and procedures of the study. The insightful and constructive guidance and comments my supervisor made is one of the essential efforts involved to maintain the requirement of research ethics. Moreover, I also employed different sources of data, varied types of data gathering instruments (triangulation); expert consultations peer de-briefing, to attain the trustworthy of the study. Lastly, de-briefing was meant for a few participants to inform them about data analyzed and interpreted in order to get their reaction. This hopefully could contribute to the authenticity/validity of study as participants get opportunity to confirm evidence (if consistent with their original information) or disconfirm otherwise.

# **Chapter Four: Analysis and Discussion of the Result on Integration of EE into Primary School Subjects**

## **Introduction:**

The aim of this study was to investigate the integration of environmental education contents and issues into Ethiopian primary school subjects. The data were obtained from curricular documents-textbooks and syllabuses, curriculum official and experts, teachers of primary schools and classroom lesson observation. The result of the study is organized into two parts standing as chapters comprising this fourth chapter and the following chapter as fifth. The reason behind this arrangement is the need to address the major research questions set separately and to manage the data analyzed as well as theme sensed from the data. Accordingly, chapter four presents and discussed the evidence analyzed to address the first research question and its subsections. The first question and its subquestions were answered using evidence from curricular document (content) analysis and triangulated with data from curriculum officials and experts interview. Evidences pertinent to the second research question are organized as part of the chapter chapter. Specifically, evidence obtained from teachers interview and lesson observations were used to answer the second basic question and its subquestions to identify the practice of EE integration into school subjects at teaching level.

As expressed in the introductory chapter, EE is considered as a learning process in, about and for the environment suggesting that planning and teaching is ongoing and interlinked. Consequently, this chapter presents the extent of integration of EE components which include EE contents and issues and local experiences in terms of **in**, **about** and **for** the environment and the approach implied and preferred. In a similar vein, perceptions held by the curriculum developers towards the EE and its integration into school curriculum also are organized under this fourth Chapter.

### **4.1. The Extents of Integration of EE Contents and Issues into Primary School Subjects**

The curricular document analysis made mainly involved Afan Oromo version (translated into English version immediately followed the original version). Yet Amharic version and English version textbooks, teacher's guide and syllabuses were reviewed for triangulation. The Amaharic

version textbook reviewing was sought for Amharic is also used as medium of instruction in a few primary schools of some towns (e.g. Jimma town) in the Zone. The integration of EE into primary school curriculum as designed in textbooks and syllabi is identified as sufficient, some and a limited extent of coverage according to representation or availability of non living and living environmental dimensions and whether essential natural resources and related issues are considered or not. It is logical to highlight the conceptual interpretation of these terms (sufficient, some extent and limited) integration of EE into school subjects has been considered as indicated hereunder. The extent of integration of EE into all primary school subjects in this context focused on the environment related contents covered, meaning conveyed and interconnections implied between the environmental components, as well as local or indigenous environmental experience infused.

The analysis result of curricular documents revealed different coverage of EE contents and issues into primary school subjects. It was found that subjects analyzed fall into three groups conforming to the above labels. Thus, subjects that contain sufficient extent of environmental education contents and issues, subject with some environmental education contents and issues, as well as subjects containing limited contents and issues of environmental education were identified (see figure 3). In this connection it seems logical to clarify the essence and distinction prevailing among sufficient, some and limited coverage of EE components into school subjects in the context of this study.

Accordingly, *sufficient integration* of EE contents and issues refers to availability of relatively enough natural environmental elements and aspects of indigenous environmental experiences in the primary school subjects. More specifically, it implies integration of what I termed essential natural environmental resources notably air, water, soil/land, and energy (nonliving environment), as well as plants, and animals (living environment). Similarly, problems which are explainable with both natural and artificial (human induced) harm directed to and exerted on the above mentioned essential resources such as air, water, soil and plants and interrelated issues also suggest sufficient integration of EE components. Additionally, conveying environmental messages and mentioning environmental meaning in terms of understanding, concern, care, respect, protection and action related experience also defines the sufficient coverage of EE components into primary school subjects.

Whereas *some* EE contents and issue *coverage* or *integration* can be understood as incorporating parts or small aspects of natural environmental elements with environmental meaning into primary school subjects.

*Limited* EE contents and issue *coverage* may mean inclusion of very small EE contents and issues without explicit environmental message mentioning. It could be regarded as using the limited essential natural environmental resource (e.g, air, plants etc.) to be used as supplementary for teaching other subjects. This distinction can be comparable to the following conceptualization of environmental components. Accordingly, environment comprises of nonliving and living things (Anil Kumer De and Arnab Kumer De 2004). Nonliving things are further classified (by the same authors) into parts having atmosphere, hydrosphere, and lithosphere, and living things as biosphere that includes plants, microbes, animals and humans. This extent of EE components integration variation from sufficient to limited scope can be also be compared to suggestion of different authorities like (Palmer 1998; UNESCO 1994; Tilbury 2005; Sarmah and Bhuyan 2015) presented under appendix 6 on page 277. Therefore, the level of integrating these components and local environmental experiences as wells as the natural environmental message mentioning in terms of proper understanding, concern, care, protection, responsible behavior variation were considered as sufficient, some or limited level of integration. This being the case, evidences were organized and analyzed according to their relevance to research questions and the dimensions of environmental education content emphasized. Interpretation was made in terms of the intents manifested related to education about, in and for the environment perspectives and associated concepts and ideas framed. The subjects analyzed in terms of their coverage of EE contents and issues by subjects visualized below is presented and discussed next

The subjects analyzed in terms of their coverage of EE contents and issues by subjects visualized below is presented and discussed next.

**Figure 3:** Source: EE Components Integrated into Primary School by Subjects as identified from textbook content analysis (2016/17)

<p><b>A. Sufficient extent of EE coverage</b></p> <ul style="list-style-type: none"> <li>• Environmental Science(ES)</li> <li>• Integrated Science(IS)</li> <li>• Biology(Bi) and Social Studies(SS)</li> </ul>	<p><b>B. Some extent coverage of EE</b></p> <ul style="list-style-type: none"> <li>• Afan Oromo(AO)</li> <li>• Aesthetics(As)</li> </ul>	<p><b>C. Limited extent of EE coverage</b></p> <ul style="list-style-type: none"> <li>• Mathematics(Ma)</li> <li>• English(En)</li> </ul>
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### **A. Primary School Subjects Integrating Sufficient EE Components**

In this section, EE contents and issues covered and messages conveyed by primary school subjects' textbooks including manifest and latent meaning of EE components were examined. The result indicated that environmental science (ES), integrated science (IS), biology (Bi) and social study (SS) incorporated environmental education contents and issues sufficiently. The primary school subjects are similar in certain aspects differ in other. They follow discipline or subject tradition; but differ by the EE contents and issue they incorporate and the emphasis they render to each. The reason behind their difference can be noted from the implication of the analysis of empirical evidence in the subsequent discussion.

The result of the analyses of environmental science textbooks' contents considered as an instance from lower primary school subjects revealed that contents of the textbooks are organized into four chapters in similar ways but spirally broadened their coverage of details upward. This is evident from the topics addressed in the textbooks as expressed in Afan Oromo-(a regional language which is also the medium of instruction). It was found that grade two ES incorporated: "Ofii keenya, Ummata keenyaa, Naannoo Uumamaa keenyaa, and Bulchiisaa aanaa (Magaala) keenya", similarly grade four textbook comprised: "Qaama keenya, Naannoo Uumamaa keenyaa, Biyya keenyaa, Naannoo hawaasumma keenyaa". The Afan Oromo version represented topics covered in second and fourth grade environmental science textbooks and these include: our-selves, our community, our natural environment, our wereda (subcity) structured for grade two, whereas our body, our natural environment, our country, our social environment organized for grade four environmental science textbooks. The main topics stated, suggest that the environmental education contents and issues structured in the environmental science subject of primary school are relatively numerous. Because, as noted from the analysis of the textbooks, of the total periods allotted to cover contents and issues of grade two (211 periods) and four (210 periods) environmental science, 156(73.3%) periods and 135(64. %) periods appear devoted for natural environment components respectively (see Appendix 4, fig.4-4.1). Moreover, out of the eight key topics structured in the two grade levels, the greater share or percentage of instructional time are found to be devoted to environment related topics; notably, ofii keenya-ourselves, qamaa keenya- our body, aanaa keenya-our wereda/subcity, biyya keenya-our country, and naannoo uumamaa keenyaa-our natural environment, are evidence of this fact. "Our-selves" and "our body" refer to humans who are part

of the living environment, while our wereda/sub city and our country highlighting place related messages partially introduces the physical dimension which is the aspect of nonliving environment, notwithstanding the interdependence existing between living and nonliving things. Likewise, “Our natural environment” as a topic represent typical environmental education component that accommodates both living and nonliving systems of the environment of which humans are a part.

As explicated earlier, integrated science, biology and social studies incorporate EE components relatively to the sufficient level following environmental science. Integrated science appears to share the feature of environmental science for it is structured based on integrative approach for grade five and six. However, the content and issues incorporated tend to focus on natural environment component and are designed as independent natural science learning area contrasted to social science. Main topics such as: air, water, vegetation, animals, our body and earth organized as chapters in grade five integrated science (IS) textbook markedly ascertains the claim made. Similar pattern is maintained for grade six integrated science design with increased scope. Likewise, biology as one of the natural science subjects planned for grade seven and eight is organized into six chapters comprising major topics such as- biology and technology, microbiology, human biology and health, plants, animals, and environment respectively. It is evident from the contents structured that the details of these topics emphasized contents related to environmental education components. It is arguable that pertinent to the objectives of the study, the topics, contents and issues identified (from textbook content analysis) can explain the coverage of EE into the subject specified. Moreover, the understanding emerging from the analysis of the detail environmental messages and description incorporated suggested the integration level and emphasis accorded to environmental dimension.

It is also identified that, the social studies curriculum for second cycle primary school is designed in competency-based mode and organized around the core concept of “living together” and then classified into two themes namely, people and their natural environment and public agenda. The themes have been further categorized into four chapters and nearly in similar ways but with increasing depth and breadth as grade level increases. For instance, the sixth grade social study textbook comprises main topics such as-Location, Settlement and People of East Africa, Earth-our home, our environment and public agenda. The time devoted for environmental education

components (perhaps specific to the natural dimension of environment) of the sixth grade social study subject, represent 41(60.3%) periods out of 68 total periods (Appendix 4, fig. 4.1-4.6). Furthermore, details of the contents and the message description, and sample learning activities, assessment strategies incorporation were examined in the textbooks of the subjects understudy for triangulation purposes. Syllabus and teacher's guide specifications of the level were also considered for cross checking.

The analysis result showed the varied coverage of contents of EE components from numerous (sufficient) to scarce (limited). Environment related contents and issues covered relatively to a sufficient level be represented in (Appendix 4, Fig. 4:4.1--4.6). In this regard, the contents considered either fall under non living or living things of the environment as categories and further divided into subcategories. The categorization does not imply any hierarchical relationship but similarity or difference of attribution. At the same time, the aspects and/or meaning emerge from the data were considered under each subcategory. In this regard natural way of environmental explanations used by authors (e.g. Anil Kumer De and Arnab Kumer De 2004) of environmental component distinctions were considered. For these authors environment comprises of nonliving and living things. Nonliving things are further classified into parts having atmosphere, hydrosphere, and lithosphere, and living things as biosphere that includes plants, microbes, animals and humans. Importantly, the interdependence existing among these environmental components deserves attention.

Consequently, environmental content and issues identified as nonliving aspects-Category of Physical aspect (CP) and living aspects-Category of Biotic aspects (CB). Then, it has been categorized into subcategories as follows. Nonliving or physical environmental components (CP) comprises essential resources notably air, water, soil/land and associated natural phenomenon-like minerals, energy sources, days, seasons etc. (CP1) and, natural environmental problems erosion, wastage, pollution etc. included (CP2). Living or biotic environmental components (CB) abide vegetation or plants, animals and microbes (CB1) and Humans, their activities, and issues (CB2). The analyses made were based on these categories and subcategories; where in the process some aspects generated and considered. The latent message noted and meanings manifested were also examined for interpretation.

Apparently, the evidence from interview revealed that EE topics and contents are integrated into primary school subjects at a varying level. Consistent to this point participating curriculum experts contended that EE contents and issues are sufficiently integrated in some primary school subjects like environmental science, science, and social studies but incorporated to a limited level in other subjects like English and mathematics (Emiru, Gorja). Moreover, the participants attributed the variation of environmental contents and issues coverage from subject to subject to factors like the nature of the subject matter (favored by many experts), and difference in awareness and experience among experts on EE and its integration into school subjects. One of the experts critically explained how discipline characteristic influences the integration of EE into different school subjects and asserted that:

The integration of environmental contents and issues depends on the nature of the subject, and grade level. From lower primary (1-4) environmental science covers adequate environmental contents and issues,... but in the upper primary (5-8) the extent of coverage of EE contents tend to be sparse (thin). ... Integration of EE is determined on the basis of its relevance (interrelatedness) to the science subjects (for example) and the potential of the marked topic to carry environmental contents and issues; in other word integration occurs as long as the main topic carries the contents and issues of the EE (Misso, M, 2017).

The result also revealed that integration of EE component into other subjects is only possible when they match with the host subjects' topics and environment related contents. Added to this, the data from the interview explicated differences in awareness and experience on EE integration into primary curricula among experts as having implication on the integration effort. In this regard one could question the existence of criteria for deciding topics/contents and scope of environmental education to be used by curriculum designers. In order to clarify the level of integration of EE topics and issues and indicating criteria, experts were asked a probing question. Curricular experts showed related views about the integration of environmental topics and issues into primary school subjects but held different positions regarding reference for EE components integration into all primary school subjects. This is evident from the following interview extracts.

Supporting the existence of reference for integration the expert claimed that:

Though the environmental contents and issues are not equal in different subjects, the K-12 curriculum framework serves as reference for EE integration. The criteria used for EE contents inclusion into other subjects is K-12 curriculum framework as a major frame. (Misso, M).

On the other hand it was contended that “there is no explicit indicator” for integrating EE components into primary school subjects. The next evidence verifies this view:

Regarding the sufficiency and the scope of environmental issues and contents coverage in subject textbooks, there are elements of EE components but it is difficult to judge the sufficiency of the coverage since we do not have clear criteria. Terms and contents related to environments are used to teach subjects like English language skills.... Even though the policy urges us to incorporate environmental contents and issues, into all school subjects it does not specify the extent of coverage (Legesse, M).

It is imperative from the above evidence that even though the K-12 curriculum framework is in place as a reference, it was found that matching (overlapping) of contents and issues of EE to hosting subjects become visible in influencing the integration EE into primary school subjects. The contention that stressed-the K-12 curriculum framework itself does not specify the area of learning and corresponding details of time needed suggests meagerness of the framework to consider EE components incorporation into all school subjects. However, it is worth noting that EE integration into primary school curricula has been provided as one of the overarching issues in Education and training Policy of 1994; specified in policy action pplan-ESDP, IV and V (2010 and 2015 respectively) and in the K-12 curriculum framework regarded EE. The latter for it incorporates learning areas, subject being offered by level and themes combining subjects and time table allocated for subjects for each subjectives (see, Appendix5, p. 275). Yet, the EE components were found not equally integrated into primary school curricula. Without overlooking the views of experts who regarded K-12 curriculum framework as reference for the integration of EE, those claimed its unclarity to frame the EE streaming into primary school curricula appear equally sensible. This might be related to the variation of experts’ awareness and experience about the essence of EE and intents. The extent of EE components integration variation from sufficient to limited scope can be compared to suggestion of different authorities such as (Palmer 1998; UNESCO 1994; Tilbury 2005; Sarmah and Bhuyan 2015) presented under appendix 6 on page 277. This leads to discussion of nonliving components of the environment.

#### **CP (Physical Category): Nonliving Environmental Components**

It was found that nonliving components of the environment have been incorporated into the primary school subjects as topics and issues of study. Nonliving environmental component in this context may refer to natural elements or resources of the environment which do not have life or are

different from biotic elements of the environment. This environmental category is a vital dimension for the survival of all other living things and interconnected with other environmental elements. The components identified under this category are further seen as three sub categories. These include essential natural resources and related issues, problems encountering natural environment and emerging meaning in terms of EE integrative components perspective.

### **CP1 (Physical Sub-Category 1): Integration of Essential Natural Resources into Primary School Subjects**

It has been found from the analysis that the nonliving components of the environment addressed in the textbooks comprise essential natural resources. These resources are believed to have no alternate values in terms of supporting operation of environmental systems and interrelationship existing among the natural environmental elements. Indispensable natural elements of the environment which should be well understood and cared for come under these themes: air, water, land/soil, energy are the main constituent of this category. Thus, the next discussion focuses on the evidence of integration of these components and the associated meaning conveyed. The result of the analysis illuminated sufficient to scarce coverage of environmental contents and issues by subjects. As repeatedly stated, the analysis result indicated that, EE components have been addressed sufficiently in environmental science subject as identified from the textbooks and syllabi. More specifically, natural environmental contents and issues are significantly visible in the ES textbooks are also covered in IS, Bi and SS. Hence, the topics, and contents structured, and the message conveyed in terms of EE integrating components perspectives in the sampled textbooks have been presented in the foregoing discussion.

Accordingly, the contents and corresponding information details examined showed the integration of typical natural environmental dimensions in the subjects mentioned. It was found that *Naannoo Uumamaa keenyaa* meaning “Our Natural Environment among other topics have been covered in ES, IS SS with a varying depth and scope varying upward (fig. 4, 5 and 7 appendix, 4). For instance *wantootni* means “matter” has been addressed as aspect of nonliving environment and described in the textbooks as: “*Wantootni amaloota fiizikaalaa fi amaloota keemikaala tiin adda addaa ta’u*”, showing that matters are differentiated according to their physical and chemical

properties; and further explicated that matters in its physical form occur either in solid, liquid or gas form, while changes of material property of a phenomena result in its chemical change.

The implication is that natural environment component is evidently considered in the lower primary subject of ES. The topics phrased and description made: “our natural environment” also reflects a sense of concern as manifested in the expression of *Keenyaa* (our). It further understandable that the essential natural resources: land, water, and air are implicitly illuminated in the occurrence of matter in the form of solid, liquid and gas. The solid (land), liquid (water), gas (air) form of matter highlighted are related to the lithosphere, hydrosphere and atmosphere parts of the earth which combined support lives (humans, plants and other animals) on the earth.

The message also revealed the meaning of natural resource and states: “*Wantoon uumamaan argamanii fi fedhiwwan bu’uuraa’ dhala namaa guutuu danda’an hundii qabeenya uumamaati*”. The interpretation of the version entails: “natural resources are all naturally occurring/available phenomena or resources which can meet the basic necessities of human being”. The concept delivered above suggests the essential environmental components considered are viewed in terms of the benefit to be derived from natural resources. The implication tends to emphasize meeting of human needs and fostering awareness. The analysis result further disclosed: “*qabeenyaa uumamaa, akkakuu qabeenyaa uumamaa -lubbuu qabeeyyii fi lubbuu maleeyyii*” incorporated in the textbooks. The information mentioned refers to “natural resource and its types, living and nonliving natural environment”. Natural resources are perceived differently in the course of the description, for example, the major elements are itemized as: “*qabeenyaa uumamaa barbaachiso keessaa biyyee, bishaan, qilleensa fa’i*”; which represent soil, water, air, as instance of essential natural resource and associated problems along suggested measures(ES, IS SS). These natural elements are indeed essential because all living things including humans cannot stay for minutes without getting some (e.g. air,) of these resources. For example air (oxygen for animals including humans) and (carbon dioxide for plants) is life sustaining element or resource. Similarly, water and soil are sources for nourishment of all other living things”.

It was noted that: “*Qbeenyaan uumamaa akaakuu haaromfamuu fi kan hinhaaromfamneti qoodamu*”. This means: “natural resource is categorized into renewable and non renewable types”. The renewable resources are described as replaceable/regenerating resources those include soil,

water, air, animals; forest, crop plants, and solar energy, while non renewable resources are seen as exhaustible resources with continuous utilization. These include natural oil (Petroleum) minerals- Iron, Gold, rocks, coal, salt (potash) etc. The text message regarding Nonrenewable resources further conveyed that such scarce resource can be properly managed through substitution and cycling or reusing some of them. For example, it is suggested that for power generation, we can use solar, wind and hydroelectric energy instead of fuel minerals; likewise metallic minerals can be reused.

Moreover, the misuse of natural resources as constraining renewability of the resource is conveyed as follows: “...*qabeenyi uumamaa kan akka bishaanii, bosonaa, biyyee fi bineeldotaan haaromfamuu kan danda’an ittifayyadmni isaanii saffisa haaromfamuu isaanii gadii yoo ta’e qofaadha* (ES, 4<sup>th</sup>, p.40). The information clarifies: “utilization degree of renewable resources like water, forest, soil, and wild animals should be kept lower than the regeneration pace of these resources if we need to use them in sustainable way”. It is understandable from the description that if humans do not properly manage the utilization of natural resources, these resources are prone to exhaustion. This is evident from the earlier expression which says “even the renewable natural resources cannot replace themselves unless the degree of human consumption or utilization of these resources are controlled and kept lower than their rate of regeneration or renewability.

As noted from the introductory part of the the analysis of the result, it is hoped that primary school subjects though at varying degree, contribute to pupils’ understanding about their environment or different portions of planet-earth on which humans’ survival depends. In this regard it is apparent from the preceding discussion that knowledge or information communication tended to dominate the subject structure. The concepts verification and factual information description (which are important) emphasized suggest the attention knowledge received as compared to environmental concern and caring attitude and skills. The implication is that where proper understanding and care and protection of the environment and its resources are urgently important these days, the latter seem less regarded. In similar vein the view implied in the natural resource conception suggests that the natural environmental components are seen in terms of the benefit derived from these resources. The implication that follows may further illuminate overlooking of environmental sustainability while emphasizing humans’ needs and awareness fostering.

Consequently, I could claim (from the contents integrated and discussed so far) that human and natural environment relationship, local environmental experience seem less regarded. Focusing on the benefit to be extracted from environment without caring for its sustainability as well as failing to consider the interdependence existing among natural environmental elements, inevitably maximizes vulnerability of humans to the environmental problems (often induced by their own activities). The dominance of humans over natural environment implicitly is manifested in the text description. For example phrase “*fedhiwwan...guutanuu hundii...*” meaning “all those... fulfill the needs of...” that stands for: “all natural resources fulfilling human needs” indicate the controlling role humans have on the natural environment and its resources to meet their unlimited needs. Hence, it follows that for concept and factual information explicated; relatively knowledge (education about environment) is emphasized, while skills and values (education in and for environment) are relatively sparsely considered. At the same time, it appears that anthropocentric or human centric view is reflected latently in the textbook reviewed, suggesting that eco-centric or earth centric perspective is not favored much. Next, the major essential environmental resources and interrelated issues will be presented and discussed relatively in detail.

## **Soil /Land**

It is obvious that land/soil is vital base for humans and all other living things survival. It is also decisive in the interconnected function of components of the natural environmental system. Earth, land, and soil deals have been structured in primary school subjects and these are evident from the details that follow.

The analysis result showed that drawing on the aspects of the earth the natural and cultural aspect of environment interrelatedness illuminated in the subjects reviewed. The contents and ideas demonstrating the linkage of natural and the cultural environmental components may include: “*Argama fi Teessuma Naannoo jireenyaa keenyaa, Dhiibbaa teessumaa lafaa*”; “*Sochiilee Dinagdee aanaa keenyaa: Qonna, Daldala, Geejiba, Induustirii ...*” (ES, 2<sup>nd</sup>). These refer to “the location and landscape of our wereda or district, the influence of relief/landscape”... contrasting to “different types of economic activities of a wereda” or district such as agriculture, trade, transport and industry as integrated into the subject textbook. Interconnection of human activities and natural environmental components can be understood from the description made in textbook

analyzed suggesting that land as part of environment solely is the basis of all human activities they pursue for necessity of basic living or luxury life.

Land related message is further communicated from wereda through regions (e.g. Oromia) to national-Ethiopia and beyond (ES, 3<sup>rd</sup>, and 4<sup>th</sup> grade). The varied landscape/relief of Ethiopia and its subsequent influence is described for instance as: "...*teesumni lafa Itoophiyaa bakka sadiitti qoodama, lafa olka'oo, lafa dakee, fi sulullaatti*"(ES, 4<sup>th</sup> grade, p.70). This expresses: "the relief of Ethiopia is grouped in to three categories including highlands, lowlands, and valleys". The message reveals that the varied relief feature specified decisively cause disparity in climatic conditions (e.g. temperature and rainfall differences), vegetation cover (e.g. forest through grass, to arid lands), and economic activities particularly agriculture. It was also disclosed from the textbook review that "altitudes influence population distribution and its activities, and indicated the ties prevailing between natural environment, populations and their activities.

The interconnection of the natural and cultural environment is implicitly visualized through description of densely inhabited highlands of Ethiopia living on rain fed agriculture contrasted to sparsely populated parts of the drier low land and rift valley areas that depend on nomadic and irrigated agriculture". The awareness about administrative settings location and diverse landscape could *inform the learners the opportunities or challenges* ahead of them related to carrying capacity of the environment and their own *responsibility*

However, there should be more room for fostering awareness, respect, sensitivity to and care for natural environment while serving human welfare and purposes. Yet the strong interconnection existing among environmental elements is not communicated well and understood as it ought to be. It was also noted that the substantive coverage of contents and learning experience designed do not seem in-depth and contributing to the flourishing of critical and creative thinking and responsible behavior which is needed for proper understanding and caring for wider and local environment. I question the meaningfulness of the content information and assessment and learning activities specified. Because most of the teaching methods designed involve discussion, and question and answer, correspondingly with objective type (true or false, multiple choice and short answer question) of assessment strategies (ES, 4<sup>th</sup>, pp.37-46; IS, 5<sup>th</sup>, pp.4, 32-39, 45-48; SS, 6<sup>th</sup>, pp.9, 23-32). The understanding emerging from the analysis may imply that knowledge (education about the environment) is more emphasized than skills and values pertinent to pupils

environment (education in and for the environment) respectively. The questionable of depth and approach of the content as well as learning experience consideration could be sensible when judged in terms of the K-12-curriculum framework guideline, and interdisciplinary nature of environmental learning as well.

The need for balancing human centered and ecology or earth centric perspectives was explicated in the subjects analyzed. The representing idea reads: “*Qabeenya uumamaa waliin fayyadamuu...*” that means: “utilizing natural resources in common”. The notions of the shared message suggest that maintaining smooth relationship with the neighboring societies by sharing natural resources contributes to the common win of countries economically, politically and socially. However, the other side of the message entails less regard given to the carrying capacity and sustainable way of interdependently operating of the environmental components. Perhaps this could have positive effect on sustainable development, yet it must be thought out in this regard that smooth relationship with natural environment should also be reestablished by humans. I consider this dimension as a missing discourse from curricular messages-*harmonious relationship between humans and natural environment*. In this connection the ever increasing human interests and subsequent intense reactions exerted to meet them in terms of science and technology sophistication I could contend disrupt this desirable relationship. Consequently, in-depth and critical understanding need be fostered in the learners educationally so that they can rationally and responsibly react/interact with their environment.

The role soil plays was further illustrated through its linkage to plants. It is stated that: “*Biyyee fi biqqilooni walitti hidhamoo dha.*” The idea specifies that: “soils and plants are interconnected” where their interdependence is further clarified as soil provides plants water and mineral, and enable them to prepare their food, support and held up to grow and process pollination. On the other hand, it is also revealed that “plants decompose and changed to soil; vegetation and animals remain decay and form humus”. This implies that soil and plants interdependently exist as part of natural environment whereby they nourish and support all livingthings. Vividly the interrelatedness revealed reflects the interconnections prevailing between nonlivings and living things; hence, suggest that harming one of these resources causes injuries in the other.

Broadly Earth and its parts have been incorporated and discussed in some primary school subjects. Among these the structure (layers) of the earth, part and whole of home continents have been

identified in textbooks such as integrated science of grade five and six and social studies of grade six and seven. The following evidence verifies this point:

*Baqqanootni lafaa sadii: handhuura (core), keessa lafaa (mantle) fi fuula lafaa (crust)*(IS, 6<sup>th</sup>, p.124; SS, 6<sup>th</sup> p. 23, and SS, 7<sup>th</sup>, pp.42-43). The description magnifies the three layers: core, mantle and crust. In one of this sources the meagerness of the parts of the earth and Eastern African feature are illuminated as instance:

[...], *Irraa lafaatti daache (30%) fi bishaa'oo (70%) argama. Namoon kan jiraatanu, harawwan if laggeen kan argamanu dachee irraatti. Qammaan bishaa'oo keessa kan tajaajila dhugaati fi kan biroof oolu %3 qofadha, kunis bishaan hara fi lagaati..., Teessumi lafa Baha Afrikaa gurguddan, gaarreen, pilaatoo, sulullanii fi lafa dakeedha Laftii pilaatoo qilleensa baramaa mijaa'aam biyyee gabbataa fi lafa diriiraa qaba; kanaafuu hojii qonnaaf, qubannaa fi walitti dhufeenya ummataaf mijaa'aadha* (SS, pp.23- 29).

It is evident from extract above that of layers of the earth; outer layer (crust) comprises the dry land (30%) and the water body (70%). The data further revealed that only small portion of earth's surface (30%) and very small proportion of fresh water (less than 3%) are available for living things and humans to live on. Consistent to this it is stated in grade seven social study textbook that clean-fresh water of our planet is only 1% which is obtainable from lakes, rivers and underground. The corresponding version in Afan Oromo reads: *Bishaan qullqulluun 1% tuu harawwan, laggeenii fi lafaa keessatti kuufamee argama* (SS 7<sup>th</sup>, p. 60). The information further explicated diverse features of the East African landscape that comprises mountains, plateaus, valleys and low lands. The content details verify how environmental components are interrelated. For instance claims that plateau lands characterizing good climate conditions, fertile soils, and plain lands are perceived as favorable for agricultural activities, human settlement, and interactions.

Thus, the evidence justified both the incorporation of some of the essential natural environmental components namely land or soil as interrelated features on one hand and conveyed messages about very limitedness/scarcity of parts of the earth and associated resources which are essential for all living environment on the other. As a result proper understanding of human-natural environment relationships and careful management of these relationships inevitably need be materialized. In this sense the factual information integrated in the subjects examined tends to focus on knowledge contrasted to deep and critical learning and responsible behavior development that contribute to environmental protection and sustainability. This is because, the information designed seems shallow and the learning experiences also appear less engaging and less challenging form of assessment. Except a few, most of the introductory activities and culminating assessment

strategies are found to focus on factual information and oral and written exercises. For example grade six, Integrated Science among others presents as part of *Gocha 6.1 and 6.2: Hiriyoota wajjin gareen mari'achuun bocini lafaa maal akka ta'e ibsaa; and gareen ta'uun lafti baqqaanota meeqa akka qabu fi maqaan isaanii maal akka ta'e walmar'achuun dareef ibsaa* (IS, 6<sup>th</sup>, p.124). The activities require learners discuss and explain in group what the shape of the earth is and what the structures or layers of the earth are, respectively. It is good that projects are rarely planned notably in some science subjects; yet, when seen in terms of meaning and competency building, it appears problematic. This situation implies the subjects under study favor education about environment more than education in and for the environment.

### **Air as Content**

Air has been considered in primary school subjects in varying emphasis and depths. The essence, functions or uses of air and its fragile nature are among deals stressed spirally with increasing level of difficulty (e.g. ES, 2<sup>nd</sup>, IS, 6<sup>th</sup>, p.8-9, SS, 6<sup>th</sup>, p.34-35). In this regard, some evidence revealing the integration of air and explaining information are given below.

Qilleensaa, amaloota fi faayida; Lubbu qabeeyyiin hundii qilleensa malee jirachuu hindna'an Qilleensa akka wantaatii oksiyijiinii bineenldotaa fi namootaa, karboondiyoksiyiidii immoo biqilootaaf kennuun soorataa akka argatanu gargaara (IS 6<sup>th</sup>, p. 9).

The description entails: "all living things cannot live without getting air. Air as a matter provides oxygen for animals including humans and carbon dioxide for plants so that they get food". The claim emphasizes the vital role air plays in sustaining life on the earth, suggesting the need for care and conservation of this natural resource for it is easily polluted by natural components. In this regard I could argue that in-depth treatment of integration of the environmental education contents should be recommendable relating to pupils' interest and life experience, by going beyond content coverage and information imparting.

Similarly voices of warning echo were reflected related to air conception: "*Qilleensi marsaa lafaa akka bullukkootti lafa uwwisee argama, caralla altiraavaayoleetii gara lafaatti dhufu ittisuun balaa lubbu qabeeyyi lafa irra jiraatanu ni baraara*" (SS, 6<sup>th</sup>, p.34). It means "air or atmosphere is described as a blanket of gases surrounding and covering the earth. Atmospheric gases by

blocking out the incoming ultraviolet rays prevent all living things from such harmful rays”. The voicing of warning echo I sensed from the expression refers to ever increasing of human induced atmospheric pollution and its hazardous effects like ozone depletion...etc. The analysis result further disclosed the interconnection persisting among essential natural resources which reflects the interdependence of the natural environmental components. One of the representing explanations says: “*Qilleensii baramaa, biyyeen fi bishaan hariiroo addaan hin cinne qabu; [...], qilleensi baramaan akaakuu fi faca’iinsa biqiltootaa ni to’ata*” (SS, 7<sup>th</sup>, p.59). It means the air-climatic condition, soil and water is strongly interconnected; ..., climatic situation influence the types and distribution of vegetations or plants.

The implication is that air is one of the essential elements of the natural environment that sustains living things, plants, and animals including humans. Humans need oxygen; while plants need carbon dioxide to prepare food for themselves and other living things in the process of photosynthesis. The interdependence of natural environmental components is convincingly shown through the clarification of the relationship among air, water, soil and plants. This could remind us affecting one of these elements, cause damage in all others. Moreover the implicit meaning of the message suggests that air or atmosphere constituting gas like ozone prevent harmful rays from striking the earth’s surface thereby saves life on the planet. However, we need to be mind full that the impact of human activities of different setting or context perhaps of the developed regions disrupt this natural system and expose life on the earth to danger. It is very well known currently that ozone layer has been depleted by effluents and pollutants emitted from industries and the situation are getting worse than before. Therefore, deep understanding and critical ability should be focused on via environmental learning so that a caring behavior can be developed in learners.

## **Water**

Water as content and descriptions of its details has been identified in primary school subjects though not at equal scope and depth. It was identified that water was integrated into the reviewed primary school textbooks, while maintaining continuity. The following description explains the coverage of aspect of water as content in the subject text analyzed: “*lubbuu qaabeeyiin hundii jiraachuuf bishaan isaani barbaachiissaa ...*” (IS, 5<sup>th</sup>), literally it means “all living things need water to survive. The information is further extended to add idea: “*Marsaan Bishaanii adeemsa bishaan irra deddeebiin lafa irraa gara samiittii fi samii irraa gara lafaatti bifa adda addaattiin*

*gadi deebi'u marsaa bishaanii jedhama*". The quote represents "water cycle which is understood as the process of repeatedly rising up of water in the form of vapor to the atmosphere and falling down to the earth's surface in different forms". This implies that water cycle appears to be central issue in the EE context, because the process involves and connects numerous natural elements. It is apparent that in the process of water or hydrological cycle solar energy serves as source of energy on the earth causing evaporation from different sources of the earth passing through processes and creates precipitation of different sorts. The message suggests that this natural cycle is very crucial to support lives on the earth for it contributes to sustenance of water availability on the face of the earth. What is expected of humans seems less regarded compared to concept learning or knowledge imparting about the essential natural resources mentioned.

The imperial evidence obtained from textbook ascertained further structuring of water resource of Ethiopia-Africa in primary school subjects. It was found that, the hydrospheric environment of the region and associated economic and ecological importance the resource as well as the richness of the country in rivers was implicated in the textbook analyzed. It was stated that: "*Bishaan lafa olka'oo Itoophiyaa irraa kallatti hundaan biyyoota ollaattii gadi yaa'a; Itoophiyaan muumme bishaanii Baha Afriikaa jedhamti, ...lageen Itoophiyaa kallattii kaaba dhihaatti yaa'an, kan kallattii kibba bahaattii yaa'an fi lageen Sulula Qiinxamaatti yaa'an fa'i*"... "(ES 4<sup>th</sup>, p.76). The description specifies that "water resource (rivers e.g. Abay, Genale, Baro...) of Ethiopia radiating from high relief flow out in all direction to the bordering countries. As a result Ethiopian is considered as center of water tower in the Eastern Africa". The implication of the message is that the natural gift of Ethiopia with river resources and availability of such rivers in that part of the Earth has the ecological importance and human need meeting functions. It is evident that even though rivers severely wash away fertile soils, their importance are numerous to living things, of which serving as source of energy, drinking, food preparation, and other economic values included.

The understanding coming suggests the water resource which is one of the essential resources obtained from different sources is exposed to diverse wastage and pollution caused by human activities implying that remediation is also expected from humans. Water function as important resource (in East Africa context) including development is explained. It was described this way:

*“Qabeenya bishaan Baha Afrikaa...harawwanii fi laggeen naannoo Baha Afrikaa keessatti argamanii bishaan qulqulluudha. Qabeenyaan bishaanii faayidaa misooma dinadgeef qaba (SS,6<sup>th</sup>, p.30-32).* The explanation stressed that water resource in the form of “lakes and rivers of East African region are fresh and clean. Whereby suggested its availability for drinking and reflected the contribution of water resource for economic development. This suggests the need for sound environmental understanding, concern and pro environmental actions development. Then integrating these contents is desirable but when seen in terms of education in, about, and for the environment is not given a balanced recognition.

### **Energy Sources**

Energy and its different sources were dealt with in the primary school subjects (e.g. ES, 4<sup>th</sup>, IS, 5<sup>th</sup>, SS, 6<sup>th</sup>). The following curricular messages represent the energy related evidence as aspect of environment:

*“Anniisaan madda baay’ee qaba isaan keessa aduu, bubbee, bishaan yaa’u, boba’a, nyaata, baayoogaasii murasaa; akkasumaas akaakuu anniisaa keessaa tokko kan ta’e anniisaan elektirikii jireenya ilmaan namaaf faayidaa olaanaa kenna; isaanis tajaajila mana keessa kaase hanga warshaalee fi industirii tiif anniisa kennuu fa’i”. ... , anniisaan lubbuu biqiltootaa fi beeyldotaa lafa irraa jiraataniif barbaachiisu kallattiinis ta’e alkallattiin aduu irraa madda” (IS, 5<sup>th</sup> p.124).*

The extract above may convey that “energy emanates from numerous sources of which solar, wind, river water, fuel oil, nutrition/food, biogas” are included. Among these, electric energy provides great benefit to human beings that range from domestic to industrial energy generation. It was verified that “all the energy or calories that plants and animals on earth need directly or indirectly come from the sun”. Similar messages have been communicated as disclosed in the curricular materials. For instance it is stated that: *“Anniisaan elektirikii maddaa akka fincaa’aa bishaanii, seelii soolaarii kkf irra argama; inni bishaan irraa maddu faayida kunuunsa naannoo qaba (IS, 6<sup>th</sup>, pp, 42-43). Bishaan laggeen gaarreen irraa saffisaan gad yaa’an humana ibsaa maddisiisuuf gahee olaanaa qabu; (Fkn, laggeen Itoophiyaa) (SS, 6<sup>th</sup>, p.26).*

The meaning these quotes stress that “electric energy may be obtained from sources like waterfalls, solar and etc. The electric power generated by river water has environmental conservation values.” The subsequent idea segment added that “river water rapidly falling down from highlands play great roles in generating electric power (e.g. Ethiopian rivers)”.

The information described conveys the importance and sources of energy via illuminating instances of some sources that are of renewable and non renewable type. It implies that human welfare is dependent on the natural environment and its resources, thereby reveals the interrelatedness of environmental components. Humans as part of this naturally interrelated system are expected to understand the inter-reliance among natural elements and expected to think and act differently cognizant of impact of their activities while interacting with and using the natural environment.

I would argue in this regard that proper understanding and responsible decision making process is required related to humans and natural environment relationship, so this direction of thinking should at least be reinforced. The implication of identifying resources as renewable (regenerating) and nonrenewable (exhaustible) could intend to enhance knowledge about the resources and need for conservation in the learners, yet critical and creative thinking and caring skills are not given considerable regard. This is verifiable from rare practical experiences and unsound exercises fused in the subjects under study.

## **CP2. Integration of Environmental Problems into Primary School Subjects**

It is very common to hear varied and serious types of environmental problem incidences these days than ever. In this regard one could ask how and to what extent environmental problems and issues are addressed in school subjects and communicated. In the present study primary school textbooks have been reviewed to seek responses to such concerns. The analysis result showed that some of the major environmental problems, causes and remedial measures specified in the subjects. The environmental problems identified include: deforestation and soil erosion, drought, flooding, air and water pollution as instances. Forest destruction has been explained through its causes this way: *“Sababoota bosonaa mancaasuu danda’anii keessaa- dabaluu baayinaa uummataa, baballachuu magaalotaa, baballina dandii konkolaataa fi kkf dha”* (ES, 4<sup>th</sup>). This quote attributes deforestation or forest destruction to “rapid population growth, high rate of urbanization, faster rate of road construction and transportation intensifications etc.”, of course all of these are human induced factors. The details of the message extended to include “effect of deforestation as creating soil erosion, drought, disturbance of natural or ecological balance, loss of wildlife, and soil productivity, etc”.

The incorporation of air and water pollution in primary school subjects as aspects of environmental problem is verifiable from the following information: *“Qilleensii faaltoota yeroo gabaabaa fi dheeraa qilleensa keessa turaanuun faalamee fayyaa namoota fi lubbu qabeeyyota biro irratti dhibbaa fida..., ... wanttootni bishaan xureessan, sochii naannoo lafa qonnaa, hara mana jireenyaa fi xuraawaa industirii fa’iin* (IS, 6<sup>th</sup>, pp. 9-11). The description entails that air is polluted by effluents of temporary and long staying type in the atmosphere and threaten both humans and all living things. Similarly, water is contaminated by such proximate agricultural activities outcomes, waste materials from homes and filthy substances released from industries.

Correspondingly, some strategies of conservation of the natural resources overviewed are visibly specified. Vegetation or forest related one is given by: reforestation, planting trees..., protecting the existing plants etc. In the same vein, the interdependence of the natural elements and overlapping of measures has also been manifested. For example: *“Teeknoolljii baayoogaasii itti fayyadamuu...”* – use of biogas technology..., *“Paarkii adda addaa hundeessun bineensota bosonaa kunuunsuu.* The curriculum message analyzed stated “establishing different parks and protecting wild animals, avoiding clearing and burning forest, and awareness raising about the importance of vegetation, as well as planting and replanting trees, avoiding overgrazing and protecting forest areas (SS, 6<sup>th</sup>, p.56). Here, the protection of interrelated natural environmental elements: plants and animals are emphasized in the subjects analyzed which are indicators of the integration of interdependent components of the environments into the curriculum under study.

The implication of the evidence obtained is that human activities appeared major cause of environmental problems. This is because, “the ever increasing human needs and their corresponding activities to meet those demands mismatch and contradict the availability of environmental resources, ie., carrying capacity of natural environment. Thus, inevitably the measures identified are expected to be taken by humans aiming at proper understanding and respect for natural environments of the planet. Unlike contents coverage, learning experience designed (e.g. activities integrated in language, integrated science and social study are of what and which or non challenge form in most cases. Hence, does not seem sound enough in term of EE goals and some of education policy standards. In the light of holistic (integrated) model- education in, about and for environment perspective, education in and for environment (holistic

environmental learning) is not emphasized. At same time creative thinking and problem solving experiences are not favored as expected.

Prevention of soil erosion as an issue has been addressed in subjects such as Integrated Science, Social Study, Biology, and this can be noted from the descriptions below:

*Maloota ittisa dhiqama biyyee- duula misooma sululaa, daagaa tolchuu fi mukkeen dhaabuu akkasumas gochoota gabbina biyyee gargaaran kan akka faayidaalee xaa'oon biqiltootaaf qaban irratti xiyyeefachuu, akaasumaas, qotaa(gully) cufuu, midhaan marsan facaasuu, humana bubbee hirdhsuu bosona (mukaa) magarsuu, fi xaa'oo uumamaatti fayyadamu (IS, pp.52-53).*

Apparently, it is mentioned in the quote that “soil loss can be prevented via campaigns of improving leached lands, building terraces, planting trees or seedlings, and ... preventing gully erosion planting trees, using natural or organic fertilizers, vegetation cover”. Similar claim is further pursued:

*Tooftaleen dhiqama biyyee ittisaan kan akka mala qonna ammayya'a, biqqiloota dhaabuu, lafa dagalee qootuu, daagaa tolchuu, sanyii jijjiiruun facaasuu Kkf. fa'i (Bi, 7<sup>th</sup>, p. 43).*

It is apparent from the above textual description noted from textbook that, practices of modern agriculture that involve: contour plowing, terracing, crop rotation, avoiding over grazing, using natural fertilizers and planting trees presented as means of minimizing soil degradation. Hence, the manifest curricular message integrated and conveyed, emphasized, “preventing soil erosion by checking traditional agricultural practices (e.g. overgrazing, clearing and burning vegetations, misuse of chemical fertilizers, vertical plow)”. The implication suggests that humans while planning and implementing development strategies, need consider environmental care and protection realize environmental sustainability. The suggestion emphasized, planning development campaign of soil conservation, using terracing, building check dams; and planting trees. Such segment environmental messages are expected to be discoursed among the stake holder through environmental education.

In similar angle of argument against wastage and pollution pressures exerted on essential natural resources namely water and air, conservation measures are expected to be communicated to students. In this regard, it was found that some measures of water conservation have been incorporated in the textbook as learning area. This is evident from the follows expression: “...,”

*bishaan qulqullinaan qabuu, naannoo bishaani qulqullinaan eeguu, bishaan faayidaaf oolee qulqulleessun irra deebi'ani fayyadamu*”(SS, 6<sup>th</sup>, p. ).

This message verifies, the consideration of “... water conservation approaches of different types, such as keeping water source clean, purifying and reusing water”. Moreover, proper utilization of rain water, preventing water pollution, using proper irrigation, and pipe system were also identified in the textbook analyzed. Thus, the information communicated suggests the ever increasing human needs, and corresponding activities practiced to meet those needs contradict the availability of environmental resources and the carrying capacity of natural environment. Then, inevitably the intervention measures as stated above, should also be taken by humans based on proper understanding and respect for natural environment components.

The implication also suggests that burning forest resource causes adverse damages on vegetation cover, wildlife, soil, water resources and aggravate climatic change. Thus, it is undeniable that pressure of any sort exerted on plants or vegetation seriously affects the ecological balance. The close link existing among natural resources reflects that if we concentrate on the benefit obtained from the environment and ignore environmental protection the consequence may be more dangerous. The essential natural environmental component-conservation coverage therefore is desirable. Yet, coverage alone is not enough if it lacks strength to influence the target audiences ‘thinking, feeling and action in order to realize sound environmental literacy and pro-environmental behavior development. The next section presents results on living or biotic category (CB) and related aspects.

### **CB: Living Environmental Components Integration into Primary School Subjects**

The living environmental elements refer to all the components of natural environment having life or biotic and associated aspects. Under this, biotic category (CB) subcategories of plants and other animals (CB1), humans and their activities (CB2) were analyzed. This section presents the analysis results of the subgroups indicated and emerging aspects and meaning from the analysis.

## **CB1. Plants or Vegetation and Animals' Integration into Primary School Subjects**

### **Plants or Vegetation:**

Of contents related to living environment, plants or vegetation possess special importance. In this connection the textbook review result revealed that plants or vegetation have been structured in the primary school subjects as study issue (e.g. ES, 3<sup>rd</sup>, 4<sup>th</sup>, IS, 5<sup>th</sup>, SS, 6<sup>th</sup>, and 7<sup>th</sup>, Bi, 7<sup>th</sup>). It was found that the nature, uses and etc. of the plants and animals are addressed.

For instance: “*Biqiloota naannoo keenyaa*” (ES, 4<sup>th</sup>) or “plants of our environment”; the importance of both naturally growing plants and those planted by people has been described. The detail referred to functions of plants included: “providing food for humans and other animals, house construction, maintaining ecological and climatic balance, habitat for wildlife, and energy sources”. The text information further itemized variants of vegetation as comprising big trees, small trees, bushes, and grasses.

The role of plants as source of food is stressed in the following way: “*biqiltoonni nyaata isaan barbaachiisuu ol oomishuun waan kuusanuf nammonni qaamolee biqiltoota adda addaa-baala, jirma, hidda, daraara fi firii irraa argatuu* (IS, 6<sup>th</sup>, p. 66). The expression revealed that plants produce and store food beyond what they need and humans get food from different parts of plants such as leaves, stems, and roots, flowers and fruits of plants. The observed evidence implied that plants do not only contribute to the meeting of basic needs of human being but also mediate conservation of other natural resources such as soil, wild life and water.

This notion is strengthened by the contents integrated and message communicated in the subjects reviewed. These include: *Biqiltuu adda addaa dhaabu fi midhaan facaasuu fi malaa eegumsa...*; *biqiltoonni madda soorata lubbu qabeeyyii tti* (IS, 5<sup>th</sup>, p.105). *Biqiltoonni uumamaa naannoo Baha Afrika, teessuma lafaa fi haala qilleensa tiin adda addaa ta'u* (SS, 6<sup>th</sup>, p. 42). The message reveals the need of sowing and protecting plants and crops..., prevalence of diverse natural vegetation types in the Eastern Africa on the basis of the relief and climatic conditions.

It was stated that green plants provide energy- prepare food and oxygen on which other living things live. Green plants possess unique natural power of converting the sun energy to chemical substances in the process of food preparation (photosynthesis) process. This implicated economic and ecological importance of the plants further conveying that beyond satisfying humans needs

growing plants and/or covering environment by vegetation contributes to the environmental sustainability. It is evident from the description that “vegetation or plants are producer of their own food and for animals, thereby support the lives of human being and other organisms”. However, the unique importance of vegetation (plants) does not seem given enough emphasis pertinent to contribution it makes to the natural environment.

I think, critically identifying this interconnection could be helpful related to environmental sustainability. The integration of plants and messages in the subjects reviewed suggest emphasis is given to knowledge (about) relative to skills (in) and value (for) the natural environment. This claim is confirmable from the sparse engaging and practical learning activities and the less emphasized interdependence existing between natural environmental components (e.g. see p. 100 of this document). It could also be argued that vegetation/plants need be studied, used properly and conserved, but the caring and protection discourse are narrowly incorporated in the content messages of the subjects analyzed.

### **Animals:**

The analysis result disclosed topics like: ‘*Bineeldota naannoo keenya*’ meaning, “The animals of our environment”; where the importance, characteristics and problems of animals have been explained. It was noted that wild animals unique to Ethiopia have been explicated, which is evident from the next version: “*Sanyiiwwan bineensota Itoophiyaa keessatti qofa argamanu keessaa bineensotaa hoosisanu gosa torbatu jiru*” (ES, 4<sup>th</sup>, p.70). This entails: “of endemic wild animals found in Ethiopia, seven are mammals”. Animal as content considered aligns with the incorporation of the living dimensions of the natural environment. The implication is that all components of environment are interdependent suggesting that all members are equally important. Furthermore, some of the animals mentioned are rare and seek special attention to their sustainability.

The evidenced obtained from Integrated Science and biology textbooks strengthening the preceding expression also were identified from the review:

*Bineeldota lafee dhabeeyyii fi lafee qabeeyyii,... Bineensonni bosonaa madaallii uumamaa fi miidhagina naannoo eegu, Kanamalee, qo’annaa barnootaa fi guddina dinagdee keessatti faayidaa olaanaa qabu. ...Itoophiyaa keessatti bineensota kunuunsuf paarkiiwwan 9 seeraan hundeeffamaniiru (IS, pp.72-73).*

[...]የጀርባ አጥንት የሌላቸውን ጥቅም አና ጉዳት... ጠቃሚ አከርካሪ ልባ እንሰሳት እንደ ንብ ማር መሰራት፤ ዕጽዋት ማርባት ... ሚና ሲኖራቸው፤ ሌሎች እንደ ቆላ ዝንብ እና ተምች ጉዳት... ተምችን ለመከላከል ያረፈበትን ሳር፤ ቁትቁዋጦ መመንጠር፤ ዛፎችን መቆረጥ፤ ጸረ-ተባይ (chemical) መርጨት (Bi, 7<sup>th</sup> ).

The quotes in similar way verify the coverage of “animals (vertebrates and invertebrates ...,” and their uses of different sort in the primary school subjects. It was found that animal is perceived useful in keeping natural balance, giving beauty to environment, for research and economic development. The second quote-Amharic version in particular provided instances of useful insect (e.g. bee) and harmful insects like tse tse fly, termite, locust and etc. Cognizant of problems they cause it also infused some ways of controlling harmful insects like the use of pesticide. In this connection, it was suggested that in order “to prevent the impact of locust, clearing the grasses or bushes, cutting tree or spraying pesticides (chemicals) where it occupies or colonizes as helpful”. The issue appears controversial, in that the existences of harmful organisms cause problems both to humans and their activities, and other living environment such as plants and animals. Conversely, the ways of controlling the impacts of these organisms sought also perpetuate further environmental problems. Hence, caution is expected to be made based on environmental education principles and values but this dimension was neglected and this may imply the impacts that human activities cause on the natural environment.

The impression emerged suggests that the essential elements of the environmental learning are integrated mainly with intention of awareness fostering emphasizing on their economic, and health related implications. Hence I could claim that education about the environment which takes environmental elements and issues as content or concept to be learnt for knowledge development is emphasized as compared to skill (education in the environment) and attitude (Education for the environment) dimensions.

## **CB2. Integration of Humans’ Needs, Activities, and Issues into Primary School**

### **Subjects**

It is evident that humans in the process of pursuing activities to meet their basic needs interact with natural environment; inevitably this interaction has process and effects. In order to investigate this pattern the primary school textbooks have been analyzed. It was found from the review of the

subjects that food, sanitation, human body, economic activities...and the like are among the contents and issues addressed (e.g. ES, 2<sup>nd</sup> and 4<sup>th</sup>, IS, 5<sup>th</sup>, SS, 6<sup>th</sup>, Bi, 7<sup>th</sup>).

## **Food**

It was noted that food is treated in terms of meeting human needs. These are evident from the expressions that follow:

“As part of “*Nyaataa keenya*”-Our food, it is described that “*Lubbu qabeeyiin hundii jiraachuuf, qaamni keenyaa anniisaa fi hoo’aa argachuuf akkasumaas fayyaa ta’uuf nyaata issa babaachiisa*”. Literally this means “all living things to survive, and our body to get heat and energy, as well as to be healthy food is needed” (ES, 2<sup>nd</sup>, p.1-3).

Moreover, animals and plants as content and corresponding message were identified. The description outlined: “major sources of common food eaten; and what food meant to humans is expressed as: “namoonni fayyaa qabaachuuf, guddachuuf fi anniisaa argachuuf nyaata barbaadu, nyaata irraa dhangaalee gosa jaha arganna. Maddii isaani: madhani biqiltoota fi bu’aalee bineenladoo adda addaa irraa ti”. *The message revealed that humans depend on food to grow, be healthy, and get heat from six types of food stuffs that are basically obtained from plants and animals. The evidence secured show the existence of interconnection among the environmental components living and non living things; where, humans need food to survive like all other living things, obtaining this food mainly from green plants-natural producers of food and from other animals. Yet it is obvious that plants and animals cannot sustain without air, water and land/soil. Thus, there is no alternative for humans except critically understanding the importance of all the natural components of the environments and act responsibly. Like all other issues, repetitions of food as learning content is maintained and covered in textbooks reviewed, of course with varying breadth and depth. In this sense food as content and issues covered in the textbook convey messages pertaining to roles, types and sources of food. Specifically the next extract explicates the importance and sources of food:*

*Lubbu qabeeyiin hundi aanniisa nyaata irraa argatu...biqiltoonni magariisnii dandeetti aaniisa aduu gara aaniisa keemikaalaa soorata keessaatti kuufamuutti jijjiiruu qabu, biqiltoonni soorata fi oksijiiniis ni qopheesuu. Seelota namaa keessatti, maddi anniisaa soorata. Jireenyaa lubbu qabeeyyii hundaaf nyaatni, barbaachiisaadha (IS, pp.105-111).*

The description entails that: “All living things obtain energy from food; green plants prepare their own food for they possess natural power of converting solar energy to chemical substance that can be stored in the form of food. Hence, plants are the only producer of food and oxygen, human cell get energy from food”. Extendedly it emphasized that “food is one of the things all livings need to survive. Food related concern was also contained in the message that manifest crop production declining by 20-40% at global level yearly; due to plant diseases, weeds, insects, and climatic factor (drought, wind, erosion) and issue of cleanliness/purity of food eaten expressed- “*Qulqullin nyaata yoo hineegamne dhibee adda addaa namatti fiduu*” (SS, 6<sup>th</sup>, p.102). This notion stresses health issue addressed through cleanliness of the food taken. Yet, some of what was included in the text as suggestion to alleviate food shortage found also to bear conflicting point of view regarding the causes of environmental problems.

It is stated that:

*Hanqina nyaata furuuf uummanis hiyyummaa fi beelaa akka hin saaxilamne qotee bultoonni maloota qonna ammayyaa itt fayyamuun callaa guddissu qabu, Qonnan Makaanaayizashiin hanqina nyaataa ni furaa; Qotee bultoonni oomisha miidhaanii guddisuuf: xaa'oo nam tolchee fi uumamaatti fayyadamuu, Jallisii fi bishaan kuussuu, teeknooloojii fi qorrichaa farra arama fi farra ilbiisotaatti fayyadamu*(IS, 5<sup>th</sup> p.113).

The above quotation depicts that in order to combat shortage of food, poverty and famine; famers need to apply modern agricultural practices. As aspect of these agricultural activities: mechanized farming, use of organic (natural) and inorganic (artificial) fertilizers, anti weed and pesticides (chemicals), and irrigation agriculture were integrated and communicated in textbook analyzed.

It is evident from the data that covering human welfare issues (e.g. meeting needs, and attaining development via economic activities) is necessary. Contrastingly, the information shared also revealed the mixes of threatening intents within the message. For instance, the notion of intensifying mechanized farming, and corresponding application of chemicals tend to compete one another. The need for improving human welfare through use of modern agricultural practice that employ modern technologies and chemicals communicated in the textbook is desirable from sustainable development view point. However, focusing only on the benefits humans derive from the natural environment in such different forms of activities inevitably cause a damaging effect on the other natural components of the environment. Consequently, rational and critical understanding of these controversies need be built in pupils through environmental learning process, if they are required

to contribute to the environmental sustainability. Moreover, in the structure of the subjects analyzed informational learning tend to dominate suggesting that education about the environment is more emphasized compared to education in and for environment consistent to the preceding observations. The result suggests that the textbook structure is not only information focused but also implicitly reflects human dominance over natural environment view. It appears that the understanding and caring for the environment lag behind the emphasis accorded to the benefit obtained from the natural environment. As a result focusing on the benefit to be extracted from natural environment should be seen in terms of cost it may owe to society at present and in future. But this dimension of thinking appears missing.

### **Human Body and Health**

It is obvious that humans' survival is based on the normal functioning of their body parts and the corresponding care made for each. Contents and messages pertinent to this has been examined in the primary school textbooks and it was found that interrelated contents such as human body ("*Qaama keenyaa*"), family planning ("*karoora maati*") and "*Qulqullina ofii fi naannoo keenyaa eegu*" which means maintaining personal hygiene and environmental sanitation, were noted from the reviewed subjects. Then incorporation of the cited contents is desirable related to environmental learning. For example, family planning as contents suggests the intention of living in rational and responsible way and regulating family size in the light of resources available. The implication is that healthy people and healthy environment need be promoted for environment sustainability and harmonious sustenance of environmental components. Human issues have been addressed in primary school subjects.

This is evident from the next excerpt:

*Qaama keenya adda addaa: somba, gogaa, kalee kkf, Faayidaa fi ga'ee qaamotaa keenyaa..., Fayyummaa fi Qulqullina eeguf, iddo murtaa'aatti boolla qotuun mana fincaanii ijaaruun bobbaa fi fincaan itti qulqullaa'uun barbaachiisaa; dhukkuboota daddarboo of irraa ittisuuf qulqullina mana fincaanii, yeroo yerootti haxaa'u, bishaanin qulqulleessun eeguu, [...] Barmaatilee miidhaa fidan: Foon fi aanan dheedhii itti fayyadamuu, haaraa(xuura'a) sirrit gaatu hafuu, bakka argaanitt qulqulla'uun rakkoo fidu" (IS,5<sup>th</sup>, pp., 114-115).*

*Beekumsii saayinssii fayyaa argannoo qoriichaa haaraa, tajaajila fayyaa kennuu fi itti fayyadama teekiloojii fayyaa ammaya'aa barbaachiisadh. Jireenyaa fi itti fufiinsii ilmaan namaa, walitti dhufeenyaa lubbuu qabeeyyiin waliin fi naannoo isaani wajjin qabanu irratti hunda'a (Bi, 7<sup>th</sup>).*

The contents integrated and information discussed represent humans attribute such as: "our body organs like lung, skin, kidney...etc and their different functions" together to sustain life (IS). The

details further state that “in order to be healthy and control communicable diseases, keeping environmental sanitation, constructing and using clean latrine” are considerable. Harmful habits like feeding on raw meat, and milk, improper disposal of effluents and getting rid of waste matter everywhere are indicated as causing problems. Moreover, causes of diseases... environmental problems such as polluting water, air and groundwater were infused in the textbook reviewed.

The second quote above further represents health science, medical research, health service, use of modern medical technology application. It added that, “the life of human being relies on the interrelationship prevailing among living things and their environment”. It is clear from the evidence that the need for awareness and care for human health have been covered and communicated through the contents pertinent to human body system. It is important that the relationship that all living things have among themselves and with their environment conveyed in the latter information.

This implies the vulnerability of humans and other living organisms to similar environmental problems. As identified from evidence, the rapid population growth, faster rate of urbanization and industrialization were characterized as causes of problems on natural environment and its resource. All these are directly or indirectly related to human activities.

### **Human Activities and Experiences**

Humans in order to fulfill their necessities persistently interact with their environment. Hence, contents and messages related to human activities and experience integrated in the primary school subjects have been examined and presented. The instances of contents and message disclosed tend to emphasize benefit derived from human activities. Economic activities of different types covered were identified including the following:

*Sochiilee dinagdee aanaa keenyaa- qonna, daldala, geejiba, induustiri..., hojii bu'uura jireenyaa fi hojii adda addaa irratti bobba'uun bu'uura jireenyaa argachuu*”.(ES, 2<sup>nd</sup>, p.106). It means “Our wereda economic activities” as involving: “agriculture, trade, transport, industries-engaging in livelihood and other activities to get basic necessities

*Sochiwwan dinagdee jechuun tooftaalee dhalli namaa oomisha -oomishu tamsaasu waljijjiiruu fi itti fayyadamuudha; haala kanaan sochiwwan dinagdee gurguddoo Itoophiyaa' qonna, industirii, turiizimii, daldalaa fi geejjiba fa'a ilaala..., qonna biqiloota (midhan) dhabuu ykn facaasuu horii horsiisuu fa'I, ES, 4<sup>th</sup>).*

The above quote explains that economic activities are “the process by which humans create production, distribute exchange and utilize; and specified the major economic sectors of Ethiopia

as agriculture, industry, tourism, trade and transport”. Particularly, agriculture involves cultivating crops (plants) and/or rearing animals, requires varied environments and climatic conditions; supporting the vast majority of the country’s population. It is imperative that, of economic activities involving humans in Ethiopia, agriculture (mainly based on traditional approach) is predominant sector relative to others. This message is conveyed in textbook analyzes as follows: *“Midhan biyyaa keenyaa keessatti kan oomishamu baay’inaan karaa aadaatiinii... graruu mala ammyyaatiin midhaan oomishuutu filatamadha* (IS, 6<sup>th</sup>, p. 72). It means, though modern agricultural way of crop production is desirable, in our country agricultural crops are mostly produced in traditional ways.

It is essential here that humans/society in the process of pursuing economic activities do not only meet their needs but also induce environmental problems while extracting resources from the natural environment. This process inevitably involves local or indigenous experience though less recognized in formal learning.

### **Indigenous Experience**

The content infused in social study textbook abides instance of cultural experience and implies its relationship to natural environment. It was found out that aspect of “Aadaa”, or “culture”,(SS) has been incorporated in the textbook, where the “cultural traditions of East African people were highlighted. Explicitly, “Oromo people and other ethnic people of East Africa were shown as recognizing plants and animals” (SS, 6<sup>th</sup>). The experience of holding green plants during ritual ceremonies and conflict resolutions and considering green environment as crucial for life sustaining justifies the assertion made. In this regard it is undeniable that, the communities’ positive attitude toward vegetation and wild animals is believed to contribute to the conservation of natural resources, thereby contributes to environmental protection. However, following the rapidly increasing population size, and introduction of emergent experiences, those values have been deteriorated these days. From this we could learn about the importance of the naturalistic experience of the community and environmental protection which are long stayed and could be effectively applied to the environmental problems though neglected in the formal learning.

Thus little regard given to the customary natural vegetation and wild life conservation belief and practice may partly attributable to the neglect of the indigenous way of managing and protecting of natural environment and its resources in the curriculum. In this connection the fact that the western view held as superior to the indigenous knowledge might partly contribute to the perpetuation of the environmental problems. Because, the indigenous cultural experience (e.g. of the East African communities) is undermined. The way of thinking and life of these societies give values to the natural vegetation, wild life and water resource etc, (Workneh, 2001; Teshome, 2013) but are scanty considered in the primary school subject textbooks.

It is worth noting in this regard that integrating EE contents is not sufficient unless its message leads to in-depth understanding and pro environmental action development. However, this seems not readily attainable as the contents information details and learning experiences specified suggest. Moreover, the idea of human dominance (anthropocentric view) over natural environment has been consistently manifested in the text description (IS, SS). The ideas of respecting, concern and caring for natural environment on contrary appear less regarded view in the subjects reviewed. Proper understanding, concern and care for natural environment I believe define the future safety of humans; hence these should be emphasized.

### **Industry and Technology**

The result of the analysis showed industrial and technological conception and roles to society as addressed in the primary school subjects. The curricular messages communicate the need for industrial development drawing on the Ethiopian context. The lower stage of Ethiopian industrial development is explicated by citing a few heavy industrial plants situated at certain sites such as Addis Abababa-Akaki, Adama, Mekele and the like. Similarly technology is perceived as follows:

*Teeknooloojiin dandeetti fi tooftaa meeshaalee maashinariii hojjachuu fi itti fayyadamuutiin rakkoo furuufi, akkasummas hojii ittiin fooyyessuu fi saffisiisuti. Hojiin madda teeknooloojiiti; qonni, industirii daldalaa fi geejjibni burqaa qaroomaati, teeknooloojiin immoo bu'aa guddina qaroomaati ... teeknooloojiin hojii adda addaa-kan akka qonnaa (fkn tiraaktara, motora bishaani...), industirii (fkn. teeknoolojii Sibiila bocuu, kan jirbii daamacuu fi foo'uu...), odeeffannoo fi qunnamtii (fkn.Poostaa, Raadiyoonii, Televiyziinii, intarneetii...) fa'ati xiyyeefannoon kenname (ES, 4th, p.108-109).*

Technology is considered as: “the ability and way of creating tools or machineries and using them to solve problems to improve and accelerate work activities. Work was seen as root of technology

and agriculture, industries, trade, and transport as initiating civilization. Technology in turn is described as the result of development of civilization. Technologies used in different economic sectors were revealed including, agricultural, industrial and information technology (e.g. postal service, radio, TV and internet). With all the economic activities described in the text, technology related ideas showed that work can generate and improve technology and later technological outcome can improve agricultural, industrial, transportation and commercial activities.

The contents integrated and message conveyed are necessary and the impression emerging reflects that desirably technological progress and its effects could foster development, civilization and quality way of life. As the evidence obtained suggests, two competing ideas could be noted. One is creative ability fostered by technological outcomes which is expected to cease problems facing humans and their environment while the other is the emphasis on technological advancement. This last point needs attention for the other sides of technological sophistication may conceal the importance of natural environment and encourage misuse of the environment. In this regard it should be noted that if unwisely human wants is more emphasized and pursued the effect could disrupt natural environment and its carrying capacity. The two views implied above have to be balanced: thinking for human benefit or welfare on one hand and considering and caring for natural environmental components on the other. The need for technological development is desirable but making it the centre of emphasis may maximize environmental problem and perhaps mirror more unsafe future and life situation on the planet. In this regard if we critically view the past trend of humans' relationship with their environment, it is obvious that as the number of population increased and technology advanced, the environmental problems increased not only in magnitude but also in complexity. Consequently, people are increasingly tended to be disconnected from natural environment.

To this regard problems associated to modern technologies have been reflected in the textbooks.

The following detail reveals this:

*Bu'aan teekinoollojii ammayyaa kan akka karaa konkoolaataa fi baaburaa, hidha-bishaanii fi warshaalee, akkasumaas qotiisa ammayyaa balbaldhisuun, rakkoo bosonni saffisa guddaa manca'uu... qabeenya biqiloota uumamaa ciranii balleesu- jijjiirama qilleensa baramaa, haramuu biyyee gabbataa, jeeqamuu madaalli naannoo uumamaa fa' aa fiduu (IS, 5<sup>th</sup>).*

The quote states that technological outcomes like road, railway and dam constructions as well as industrial development and agricultural modernization are claimed to cause environmental crises. They may cause high rate of forest destruction and this cyclically result in climate change, loss of fertile soil, and disturbance of ecological balance and the like. The implication suggests the need for proper understanding of the strong interdependence existing between humans and natural environment, as well as the impact of activities of people on their environment. It could be viewed that both the natural resource and cultural outcomes of the society need be properly understood and managed so that they can be used sustainably. The understanding emerging further implies how the outcome of modern technology affect one of the important natural resource- forest and in turn induce complex environmental problems, and implicitly suggests the need to mediate the effort for sustainable development and natural environment protection. However, the contents and experience incorporated in the textbooks do not seem contributing to nurturing critical thinking and problem solving capacity in the target learners. This is because, specifications made and activities set, appear loose and do not engage students much as desired. Thus, for EE characterizes emerging and process oriented the gap implied is expected to be bridged during the teaching- learning process by teachers.

### **Population and its Attributes**

The population and its attributes as contents have been identified from the primary curriculum reviewed. The messages communicated explain the why of population related information and the impact the rapid population growth poses. Studying population is perceived important for development which is unthinkable without environment. Population size data is seen in this sense:

*Baayina ummata beekun, kan barbaachisuuf mootummaan hojiiwwan misooma hawaasaa (Fakkeenyaaf tajaajila bishaan dhugaatii, ibsaa, fayyaa, barnoota fi kkf.) Karoorsuuf waan fayyaduf". Faca'insii ummataa Itoophiya bakkan, garii caalu (84%) baadiyyaa yammu jiratu, xiqaan (16%) immoo magaalaa keessa jiraata; baay'inni ummataa dabaluun guddina biyyaa irratti dhiibbaa qaba (ES, 4<sup>th</sup>).*

*Ummanni naannoo Baha Afrikaa (gara milliyoona 268 tilmaama bara 2008/09) biyyoota kan baldhinna lafa adda addaa qabanu keessaa qubatani jiru. Qbeenya uumamaa kan akka bosonaa fi bineensotaa akka hin mancaanee fi hin bannee eeguu. Dabareewwani aadaa fi amanti ummataa ibsanis bakka argamanutti eegamuu fi kunsuunfamuu qabu (SS, 6<sup>th</sup>, p.8).*

The first quote explains that “the knowledge of population data is needed by the government of a country for development plans such as social service delivery (e.g. health and education service)

and infrastructures building (e.g. potable water, electric power).” The Ethiopian population distribution varies by setting, and rural areas support the larger proportion (84%), while small size (16%) resides in urban centers, and increment of population number has impact on national developments”.

The second extract demonstrates that the populations of East Africa (estimated to be 268 million in 2008/9) reside in countries with different area size, implying the need to protect natural resources (e.g. forest, wild life), cultural and ritual heritage sites. The implication is that, the land or space which is the main source of other resources is clearly dissimilar in size and perhaps in endowment among Eastern African countries yet supports the people of the region. The claim made about need to protect natural resources (e.g. forest and wildlife) and the cultural and religious heritages of the people suggests seemingly equal regard given to both natural and cultural issues; but in my perception natural environment and its resources are primary and the basis for all other human activities or cultural achievements, hence deserve due consideration and care. This implies the integration of curricular contents to be learned and the opportunities available of students to learn about their home-country and surrounding region. Moreover, limited territorial space each Eastern African countries has and the impact of inevitably increasing population size inhabiting each of these countries is incorporated.

It was explicated that rapid population growth has undesirable impacts such as: the following

*Saffisaan dabaluu baay'inna ummataa dhiibbaa heeddu qaba isaanis rakkoo jireenyaa maatii irratti fiidu, guddina dinagdee, qabeenya uumamaa fi tajaajila hawaasumma miidhuu, rakkoo naannoo uumamaa irratti dabaluu; fakkeenyaaf, lafa qotiisa babal'suuf jecha bosonaa mancaa'suu, kanaaf bineensonni ni dhabamu, roobni ni xiqqaata, bishaan ni dhabama, biyyeen ni harama..., akka fakkeenyaatti Biyyoota Baha Afrikaa naannoo addunyaa kamiyyuu caalaa saffisaan dabaluu ummataa olaanaa qaba (SS, 6<sup>th</sup>).*

The message outlines the impacts of “rapid population growth among which mismatch of the family size and supporting resource, pressure on economic development natural resource and social” service were some. It also noted that the effect of rapid population growth results in heavily fragmented agricultural lands, misuse of land and deforestation subsequently worsen soil erosion and climatic change. East African countries are cited as instances of areas experiencing the highest population growth of all part of the world.

The curricular message also illuminated that “population growth may cause unnecessary burden on the life of family and society’s economic development. Moreover rapid population growth severely

affects social service delivery and resources of the natural environment”. The analysis evidence suggests that integrating population and its attributes in primary school curriculum is important for both environmental learning and sustainable development. Because convincingly, understanding the impact of rapid population growth on family, societal development and natural environment require population data. The impression drawn magnifies that the population pressure on the carrying capacity of the environment is judged from population data but this link and associated future concern remained implicit in the subjects reviewed.

In similar angle of argument, how natural condition affect population distribution on one hand the pressure of rapid population growth and technological advancement impose on the natural environment on the other were disclosed from the textbook review.

The extracts below illuminate this:

*Faca'iinsii ummataa teessumma lafaa, qilleensa baramaa fi gabbina biyyee fa'iin garii garaa Naannoon pilaatoo Baha Afrikaa, haala uumamaa qubannaa ummataaf mijaa'aa qaba. Naannooni gaarreen gurguddoo fi lafa dakee, Baha Afrikaa immoo mijaa waan hin taanef ummanni haphinaan jiratu (SS, pp. 8-9).*

*[...]naannoo qilleensa mijaatatti ummatni yammu baayyaatu, naannoo hinmijoo-finneetti ummanni hin baayatanuu, haala teessuma lafaa qonnaa fi mijaata ta'eetti namoon baay'inaan jiraatu. Fakkeenyaaf lafa bishaan qabu, lafa diriiroo, naannoo biyyee gabbataan jirutti ummanni ni heddumatuu, naannoo albuuddan keessatti argaman ummanni baay'inaan jiratu. "Akka waliigalaatti wantoonni qubannaa ummataa irratti dhiibba qabanuu- haallan uumamaa fi leecalloo fi haala siyaasaati" (IS 5<sup>th</sup>, p.17).*

The idea coming from the first quote portrays that the distribution of Eastern African population is influenced by natural phenomena such as relief, climatic conditions and soil types. The plateau of the region and its natural setting (e.g. land escape, climate and soil) are believed to be conducive for human settlements. However, High Mountain and low land part of region are sparsely populated because of shortage of rain, high temperature, sandy soil and prevalence of insects respectively.

The second quote confirmed the previous claim and justified how wet climate, availability of arable fertile soils and plain land, and minerals attract population than others like dry areas. It was indicated also that generally natural conditions, resources, and political climate influence the human settlement. It is imperative from textbook review that the importance of natural environment to humans is clearly revealed. The implication suggests that as humans strive to meet

their needs and pursue development they need to act in responsible way to sustain the natural environment if they have to live in the safe environment in sustainable way.

It is imperative that the primary school subject content analyzed varied on the basis of integration of contents and issues pertinent to environment and environmental messages conveyed and essence explained. Moreover they also differ by the emphasis accorded to essential resources (air, water, soil, plant) and indigenous environmental experiences. The subjects examined and discussed in the preceding section were found to be considered relatively as subjects integrating EE components to a sufficient extent. This led us to the subjects incorporating EE components to some and limited extent in contrast. Similar findings have been reported by Lydia and Peter (2013) that investigated mainstreaming of topics on global concern towards the environment, social impact on the environment and methods of conserving the environment in the Kenyan school curriculum.

However, these findings did not explicitly identify the disparities of EE components magnitude and emphasis by learning areas and levels so that implication can be thought-out. Another study through teachers' perception and practice lenses undertaken in Tanzania found out unequal treatment of EE contents into all subjects and prevalence of more environment contents in science, social studies and geography than in other primary school subjects (Lydia, 2011). The finding cited supports the results of the present study to a certain extent but not the same in emphasis of sources of data. The present study relied on curricular documents and teachers, but Lydia did not clarify the reasons for disparities of the scope EE characterized in primary school subjects. However, the present study attempted to examine the underlying reasons for differences in EE components inclusion into other primary school subjects.

### **B. Primary School Subjects Integrating Some and Limited EE Components**

It is evident from the previous discussion that primary school subjects integrate EE components differently. This subsection presents and discusses the evidence manifesting some and limited EE contents and messages covered in the primary curriculum. Afan Oromo (AO), English (En) and Mathematics (Ma) as instance of representing the above subcategory respectively are examined and presented then (see table 2 in Appendix 4).

In order to make the discourse understandable and consistent to the previous categories of nonliving (CP: CP1, CP2) and living (CB: CB1, CB2), environmental dimensions (defined on page 103) are maintained in this discussion as well. As highlighted above the subsection B and the

supplementing (Table 2, Appendix 4) represent the subjects integrating some and limited environmental contents and issues. Some EE Contents and Issue Integrated into Primary School Subject such as Afan Oromo are discussed below.

### **Some EE Contents and Issue Integration into Primary School Subject Afan Oromo:**

#### **CP1. Integration of Essential Natural Resources in Afan Oromo (AO) Subject**

It was found that in the process of facilitating language skill learning AO incorporated some contents and message directly or indirectly related to environment. It is worth to remember here that in the context of this study essential natural resource mainly refers to air, water, and land/soil, from nonliving dimension and plants/forest from living environment aspects. In this connection though the nonliving and living environmental components are set apart and examined, their interdependence and the environmental messages organized and explained were analyzed. The question is how these natural environmental elements are integrated into primary school subjects and their messages shared (about, in and for the environment) and explained. The extent of coverage/availability of these environmental components, and the explanation of environmental messages as well as consideration of pro environmental indigenous experience, determines whether the primary school subjects fall into sufficient, some or limited extent of EE contents and issues integrating subjects. In similar angle of claims, the predominance of awareness, knowledge or information of environmental message in essence, explains education about the environment. When contents and related information communicated consider environment as resource, learning context, source of local/indigenous environment experience, as well as infusing of engaging/practical learning experience it is regarded as education in the environment. Similarly, if a concern, caring and protection intent is manifested as well as environmental ethics considered, and then this represents education for the environment.

#### **Water**

The textbook content analysis result showed that while focusing on their core areas, subjects like Afan Oromo incorporates some environmental contents and issues including water. This can be confirmed from the following text evidence as obtained from grade four Afan Oromo textbook (p.8):

*“Lubbu qabeeyiin hundii bishaanin jiraatu, namootni bishaan dhimmaa addaaf oolchuu. Nannoo roobni ga’an, jiidhaa, margii, fi biqiloonni biro ni marguu qonnaaf mijaata dha bishaan bakkaa*

*roobni ga'a hintaanetti goginsa fiida. Maddi bishaanii lafaa, hanqinni bishaan hoongee fidaa''.*

The notion of the message explanation is this: "All living things live on or supported by water, humans use water for many different purposes. The source of water is earth, lack of water causes drought; in rainy and wet areas, grasses and other plants flourish, agriculture can be practiced; however, where there is not enough rain drought occurs (see Appendix 4, Table 2, pp.275-277). The implication emerged suggests that water is indeed essential because it sustains all living thing. It was also indicated that humans use water for diverse purposes (e.g. economic-agriculture), and lack of water results in drought and drieress (desertification). The data further disclosed the interconnection prevailing among the natural elements, where it explains the earth is the source of water; availability of water (wet and rainy areas) makes plants (grasses and forest) cover and agricultural activities a reality. Thus, EE content and its corresponding environmental information have been shared.

Similar description was made regarding the benefits of Ethiopian rivers under issue of "*Lagoota keenyatti fayyadamuu*" or "utilizing our rivers".

The significance of Ethiopian major rivers and associated problems were described as follows:

*Lagootni faayidaa guddaa qabu, faayidaan lagoota keenyaa irraa argataa jirru garuu amma eegamu mit. Lagooni gurguddaan kan akka Abbyyaa, Gannaalee, Baaroo, Gibee gara daangaa biyyoota ollaatti yaa'uudhaan biyyaa biraa sooru; biyyee gabbataa keenyaa dhiqaanii geessuuf. Faayidaan lagoota keenyaa kana caalaa babal'atee, misoomu fi jireenyaa keenyaa fooyyeessutu irra eegama (AO, 5<sup>th</sup>, p.15).*

The message conveys that, "rivers offer great benefits, yet the benefit being drawn from our rivers is not sufficient as desired, the larger rivers like Abay, Genale, Baro, and Gibe flow out crossing Ethiopian border, and erode and carry fertile soils to the neighboring countries and feed them". It is further contended that, "the benefit to be derived from our rivers should be promoted and used for development and improvement of life". Thus, water resource as content was perceptibly infused in the examined subject, but in terms of environmental message, the last quote tended give more emphasis to the benefit to be derived from the natural resource as compared to what to do for these natural dimensions. Yet, it was contended that rivers were perceived as natural threat to soil; claiming that the environmental problem-soil erosion is induced by river water. This implies that

more focus was given to exploiting river resources compared to care that should be given to the environment (education for the environment).

### **Integration of Local or Indigenous Environmental Experience**

The exploration of integration of EE components from Afan Oromo subject disclosed the interconnection of the natural and cultural aspects of the environment from a passage. The Indigenous experience is manifest in the textbook as “*Guyyaa Ayyaana Irecha*” (AO, 2<sup>nd</sup>, grade, p.12). Literally it means the “Festivity Day of *Irecha*”. The expression illuminates cultural celebration of Oromo people which is thanks giving occasion to *Waaqa*; i.e. God. To this practice the communal decision making and communal problem resolution are associated. For instance, the ceremony of *Irecha* is held in wet and bright season as well as in green and river basins areas suggesting that the message it conveys teaches us the need to have harmonious relationship with our natural environment. Furthermore, the phrase is supplemented by pictures depicting people gathered under big trees, perhaps sacred trees like *Oda*. Moreover, we could recall from the values attached to the site of such *Geda* cultural practices where the whole surrounding environment (e.g. land, water sources, plants, animals etc) will be cared for and protected according to the principles and norms known as *safuu* of the system. Therefore, infusing of this experience demonstrates the integration of environmental matter that of local experience relevant to environmental learning. Still it could be argued that in the eye of complex environmental problems being faced, local environmental experiences are scarcely integrated in the subjects reviewed. At the sametime the teaching and assessment strategies set do not seem helpful for the development of skills pertinent to critical thinking and problem solving (see table 2, Appendix 4).

### **CP2. Integration of Environmental Problems**

On the other hand, contents related to climate change and sanitation expressed as: “*Jijjiirama qilleensaa fi rakkoo isaa, qulqullina manaa; qulqullina dhunfaa fi nannoo eegu. Qaama fi dareefi mana barumsa qulqulleessuu miidhagsu qulqullina ofii daree moora eeguu* (AO, 2<sup>nd</sup>, pp. 16, and 41) have been addressed in the subject. It is very well known that currently climate change and sanitation issues are among the most serious issue of the global community. The implication of the message, suggests, though the focus is fostering language skills, implicitly the aspect of climate change and associated problems such as strong winds, flooding, drought and warming were noted. Environmental sanitation and personal hygien issues were presented as component of activity.

Moreover, the complex nature of environmental problems was illuminated through the description made about soil depelation and the damage exerted on wildlife. It was stated that

*Biyyeen sochii namootaa fi addemsa ummattiin haxaawama; ciramuun bosonaa fi mukaa dhiqama biyyee fida. Namooni shira bineensoota irratti dalaguu, faalama qilleensa naannoo araa warshaalee keessa bahuu lagaa ni faala kun immoo bineensota lafaa irraa fi bishaan keessa ni galaafata (AO, 4<sup>th</sup>, p.101 and 120).*

The description respectively etails “soil is eroded by both huma activities and natural factors. Clearing forest and cutting trees are the cause of soil erosion; and humans are harming wild animals. Air pollution caused by industrial effluents and water pollution injures both terrestrial and aquatic animals. It is identifiable from the evidence of the result that Afan Oromo has incorporated instance of very serious environmental problem like climate change and soil degradation and personal as well as environmental sanitation. Thus, the integration of some environmental education contents into the subject is verifiable but the environmental message is less explained except in limited passages, where most the contents were presented as part of activites or exercises (see Appendix 4, Table 2, pp.275-277).

### **CB1. Plants and Animals Integration**

According to the study result some environment related information was noted in Afan Oromo textbooks either presented as a question or descriped in the passages. Some of these are given next: “*Biqiltuu maaliif kunuunsu?*, *Biqiltuu waddeessa dhaabani kunuunsan guddate, gaadisa ta’a*. Meaning- planting the seedling of Waddessa (Wanza) and conserving makes grow and proide shade (AO 2<sup>nd</sup>, P.16, 29). *Naannoon keenyaa wantoota dinqisiisoo hedduu qabu: biqiltoota daraaraa adda addaa jirachuu fi ilbiisonni fi allaattiiwwan bifa garagaraa kanaa irratti hunda’uu*. Mukkinni gaadisaa ta’uun roobaa harkisaa faayidaa namoota keenaa, the meaning refers to “Our environment is provided with various natural elements. Plants and plants flowers, insects and birds of different colours represent this gift. Trees serve us shade, sources of rain, and provide economic benefit (AO 4<sup>th</sup>, pp, 5 and 89).

In the same vein from passage structured in fifth grade AO, I noted message about responsible way of using elements of natural environment specifically plants. The title refers to:

*Maanguddoo Qonnaan Bulaa” a Passage about "an old farmer". The passage details convey the contrasting views related to environment and its resource management that persist in the society. “Namichi fardaan gara adamooti deemu maanguddoo qonnaan bulaa waggaa 80 biqiltoota dhabaa jiranuun akkass jedhe: Muka ijaa irraa hinnyaanne dhaabuun gowwoowummadha.*

*Maangudoonis, kun gowwummaa mit ‘amma ani muka akaakayyuun fi abbaan koo dhaaban irraan ija nyaacha jira. Kanaafuu, anis ilamaan koofi joolee isaaniti ija muka kanaa akka nyaatan dhaabuun koo gowwummaa mit jechuun deeb’isaniif* (AO, 5<sup>th</sup>, p. 12).

This piece of writing in Afan Oromo presented in students textbook addresses a dialogue held between an old man of 80 years planting seedlings and a man heading to hunting. The man said to the old man planting trees which you cannot eat (use) its fruits is foolishness (unwise). The old man replies: “I myself have been eating the fruits of trees planted by my grandparents and father; I must cultivate plants for my children and grandchildren”. It is evident from the information (AO, 5<sup>th</sup>, pp.12-13) that, two important view points are indentifiable regarding environmental understanding and protection: one, proper way of utilizing natural resources; and the issue of natural environmental conservation through means like replanting seeds so that the next generation can use and contribute to the use of these resources in a sustainable way. This was communicated by the old man character; and the text beyond integrating one of the important natural environmental element plants, implicated semantically the decisiveness of proper understanding and cares for environment and its resource. The other view is that questions an old

Man and manifested in: “*Muka ijaa irraa hinnyaanne dhaabuun gowwoowummadha*” which meant planting or cultivating tree that you cannot use is unwise this implicitly illuminates the view of self and human centered perspective to the relationship that prevails between humans and natural environment. Moreover, the latent meaning contained in the story communicates the interdependence of both humans and natural environment as well as inter generational responsibilities regarding the relationship they have with natural environment (earth or eco centrist view). The other information communicated by the adult man is against the responsible behavior and unsustainable towards the environment. He argued against the productive and careful endeavor an old man made; and the intention he is heading to (hunting) also does not reflect any concern for the environment and its resources, rather bothered about his immediate consumption of the natural resource (human or anthrop centrist).

The analysis result further showed that AO, integration of plants appears fairly visible but animals as content seem sparsely integrated. This is evident from repetitions of plant related information like: “*Biqiltoota kunuunsuu, biqiltoota qe’ee nyaataa oolan, hojii qotiisa...*”; contrasted to animals related expressions which reads: “*faayidaa bineensota, kanniisaaa..., and biqiltoota adda addaa dhaabuu fi bishaan qopheessuun kanniisaa horsiisuu*” (AO, 2<sup>nd</sup>, pp. 24, and 32), and, “*Namoon*

*nageenyaa fi mirga lubbuu qabeeyyii biros kabajuufi kabaachiisuu...*” (AO, 4<sup>th</sup>, p. 120). It is apparent from the evidence that the importance of plants and animals and need for conservating these resouces were explained. The last expression of the AO version in particular denotes that “humans should respect and protect the life of other living things”. Hence, the study evidence revealed some EE contents and issues incorporated in the subject analyzed; yet the explanation is restricted to the importance of the resources and partly mentioned necessity of respecting and caring for environmental elements. This is the desirable aspect (environmental ethics) of environmental study. The evidence also explicated that the contents considered this subject relatively tend to emphasize living/biotic aspect of the environment as compared to nonliving dimensions. Therefore, the identified contents are least indicators of integration of some environmental education contents in the subject textbook analyzed.

### **CB2. Integration of Humans and related Issues**

The analysis result elucidated that some EE contents and issues are incorporated in AO subject. These components were found directly or indirectly related to humans’ needs, activities or welfare. It was also noted that these elements are basically used to support language learning but partly manifest environmental messages. Some of these observations are presented below.

#### **Clothe:**

The following evidence shows consideration of one of human basic needs: *Uffataa, meeshaa fi - faayidaa issa* (AO, 2<sup>nd</sup>, pp. 7 and 10). The phrase states: “clothe, its raw materials, and uses”. This implies the action and interaction existing between human being and their natural environment to procure clothes using resource (meeshaa) from the environment with the purpose of adorn and health securing or contentment.

In this regard I could argue then covering issue of clothes, its sources and utilities in AO is desirable. There are reasons for this, one is humans basic necessities (clothes, shlter and food) are obtainable only from natural environment; two, as AO is the instructional language and perfectly spoken by most of the students learning such contents can be meaningful if supplemented with adequate engaging learning activities and connected to the local experiences. Connecting to local experience here I mean creating opportunities for students to learn from real indigenous experience and life at least informally through teachers’ guide. However, covering the content and

expressions in passage does not seem enough, because learning activities and assessment strategies designed appear less engaging (see Table 2.1, appendix 4) in this case.

## **Health**

The study finding further disclosed the integration of personal hygien and environmental sanitation in AO textbook. Some of these issues are evident from the following expressions: “*Qulqullina dhunfaa (fkn. ilkaan) fi manaa fi nannoo eegu qaama fi daree fi mana barumsa qulqulleessuu miidhagsu* (AO, 2<sup>nd</sup>, p.16). *Nyaata fi bishaan ququllinaa qabani itti fayyadamuun dhibee of irra ittisuu*” AO, 4<sup>th</sup>, p.12). The notion of the expression stressed the issues of “keeping ones hygien and home, school and sounding environment”. The description also suggested preventing diseases by keeping food and water clean.

The sanitation issue, exhibits the concern of health, and thereby reminds us the need to minimize environmental pollution. The implication suggests how human beings are responsible related to the cause of diseases and remedial measures as well which is explainable interms of the interaction humans have with ther natural environment- harmonious or raptured.

Cognizant of the incorporated contents I could claim that, the opportunity available for students to learn environmental messages and real life experiences seems insufficient because contents pertinent to natural environment and local experience are scarcely icoporated. Moreover, the learning activities and assessments strategies set are dominated by oral and written experience. Then, it is obvious that the practical activities and environmental message never be explained enough, suggesting that in the text more focus is placed on information (knowledge) and/or (language skill) compared to skills and attitude related to EE.

In this connection while I was attempting to get evidences of refinment from regional curriculum experts and officials; I noticed that the recently revised and introduced lower primary Afan Oromo textbook was questioned by stakeholder and replaced by the previously abandoned/left out versions. The reasons and justifications explored for abandoning the new textbook was found convincing as noted from the indepth interview held with one of the region level curriculum team officials.

The curriculum official revealed that:

The textbook was written by an agency hired by state ministry of education known as EGRA (Early Grade Reading Agency); where the process followed by the center did not obey the legitimate mandate of the regional state. Moreover, the act was also critiqued for changing the meaningful and well adapted alphabetic order-ABC... to the vague order-LGIM; as well as overlooked the communities' experiences and perspectives such as heroes, cultural values and the like(Jale, M).

Consequently, I was forced to overview some of this level AO textbooks to check the extent of EE components integration. I have tried to examine second and fourth grade AO textbooks and found that EE contents and messages are considerably visible in the reused version relatively (Table, 2.1 and 2.2). For example grade two incorporates: “*Naannoo, lafaa, beeyladoo, biqiltoota...*”, as parts of word construction. The words stand for: “environment, land, animals, and plants” among others. The text further infused: *qulqullina dhunfaa, daree, mana barumsaa fi naannoo, kosii haruu, naannoo qulqullinaan eeguu, Muka Waddessa dhaabani kunuusuu...*etc. These last expressions refer to: personal hygiene, classroom, and school wide and environmental sanitation, waste disposing, planting big trees and protecting.... etc. (pp.45-47). It was found that the 4<sup>th</sup> grade AO textbook tended to manifest environmental messages. These are evident from the contents covered and details made as follows: of the contents identified *bishaan, biyyee, qilleensa, bosonaa*- meaning water, soil, air and forests are included in the passage. It also incorporated: *dhiqama biyyee, faalama qilleensa; qabeeyaa uumama, beneensoota kunuunsuu, naannoo qulqulleessu* among others. These signify soil erosion, air pollution, natural resource, wild animals' conservation, keeping environmental sanitation. Thus, it is clear from the observed evidence that the contents identified in relative term touched issues of air, water soil, and plants. Though the main intent is language skill development, the meanings shared partly convey environmental messages.

Likewise, instances of environmental problems and remedial suggestions were infused into the subject analyzed. However, the contents infused and messages conveyed are information focused (in addition to language skill targeting) which favors education about environment view, while education in and for the environment are less regarded. Because, these textbooks also use environmental matters to supplement language learning and tend to neglect indigenous environmental experiences. It is also worth noting here that in order to identify the extent of integration of topics or content of environmental nature is not enough, unless both the manifest or latent message describe is examined and interpreted. This necessitated the due analysis of the contents of primary school textbook by subject; whereby Afan Oromo was found to be one of the

subjects incorporating some EE contents and issues. In this regard I could suggest that learning experience (activities) could have been thought out to connect learning to resources and expertise from the environment that may foster both language and environmental learning.

Consistent to this, studies (e.g. Lake, 1994; Gibson and Ewing, 2011) emphasize the need to shift to connecting classroom content learning to students' real world experience. For instance Levitan (1991) as cited in Lake, (1994) states that learning was enhanced as specific subject area students were made involve in complex discussion that required them to make connection between contents of learning area; (in our case language aspect and environment deal) and the real world. It is also claimed that advocating for integrated curriculum (which may characterize connection to environment and constructing meaning) Gibson and Ewing (2011) suggested teachers need be liberated to facilitate students' inquiry into deep and compelling issues and emphasize deep learning instead of focusing on curriculum coverage. This directs us to the analysis of subject *covering limited EE components*.

### **Limited Integration of EE Contents into Primary School Subjects (Mathematics (Ma), English (Eng))**

The mathematics textbook reviewed revealed that environment related issues are incorporated in a limited extent. It was found that of the components integrated in the mathematics subjects' plants and animals have been used as example in the word problem. Consequently when compared to living environmental aspects (CB) nonliving environmental dimension (CP) are scarcely incorporated in the mathematics curriculum. Hence, following the categorization trends introduced on page 104 does not seem sensible. The contents observed dictated the pattern of analysis discussion.

#### **CB1: Plants and Animal as example**

From primary school subjects reviewed it was found that of the environment related contents biotic (living components) are integrated in to mathematics grade two. One of such evidence is the following: "*Biqiltuu ... , dhaabuun dallaa itti ijaaruu*" (Ma, 2<sup>nd</sup>, p.1). The meaning of the phrase entails, "growing plants and fencing around". The example reflects that the core goal mathematical concept understanding, the message of 'planting trees such as ejersa trees' is explicated in a way. In this regard, one could imagine about the importance of planting and conserving trees like ejersa

to which most of Ethiopian community are familiar commonly found in church and ritual sites. Even though not manifestly asserted the meaning embedded in the instance used may suggest that planting such trees and similar plants can play significant role in protecting the natural environment in sustainable way. It was also found that different pictures of some plants and animals have been incorporated as supplementary to the mathematical concept learning (ibid, pp. 20-24). However, the intent, as noted from the details of the text, is to concretize the mathematical concepts and skills that characterize problem solving in the area. Plants are repeatedly used to clarify mathematical factual information; these are evident from the description of “*Biqiltuu ejersaa ... bara walittifufuu dhaabamee*”. Manifest emerging meaning seems limited to the learning aid (media) as conveying factual information which lacks strength to attract the attention of the target learners beyond the main subject matter message.

In the same vein, with mathematical word problems description – “*Biqiltuu baayinaa adda addaa qabanuu barattootan dhaabamuu...*, (ibid, pp.33-40)”- meaning ‘plants of varied size grown by students’ were identified from the review. The data further revealed that the incorporated environmental components are mainly restricted to plants, along with the core emphasis of mathematical conceptualization and problem solving experience. Therefore I could claim that the EE components integration into mathematics subject is scanty or very limited than expected. This is because factual information and computational skills are more focused; while the opportunity of experiencing and learning of environmental aspects is also lacking.

In unit two, of grade two mathematics examples and pictures from environment elements (mainly plants and some animals) have been designed in similar ways. In this regard among examples used expression that says “*Biqiltuu kuununsuu...*” is included; the notion entailing the importance of ‘plant conservation’. Hence the analysis result disclosed that, from the holistic view of environmental learning, obviously the integration of EE contents and messages are not addressed as desired and likely it is not aligned to the national education and training policy directives. The overview of 1-4 mathematics syllabuses reveals that though environmental issues are used as learning aids in a limited extent environmental message is hardly conveyed. The limited environment contents and issues were mainly intended to supplement and concretize the subject matter concepts and mathematical problem solving skills.

The EE component integration in upper primary school mathematics also follow similar trend. It was found that environmental contents and messages are not only insufficient but also fails to convey environmental meaning. For example grade six mathematics subjects infused limited environment related items basically to serve either as examples or as learning aids. The instances of environmental components identified from grade four, six and seven mathematics verify this point: “*Biqiltuu mukaa waa’ee reeshoo ibsuu*, this means explaining about ratio using seeds of trees” (Maths, 7<sup>th</sup> p.48). In similar way grade six mathematics incorporated the expressions “integers of negative number using temperature below zero, average temperature difference between some planets of the solar system including Earth; ..., altitudinal difference between the highest place- Ras Dashen and lowest place-Denakil in Ethiopia; a set of beautiful wild animals of Oromia” and two children can clean a classroom in 20 minutes.”

The implication emerged suggests that air temperature, place altitudinal difference, plants and wild animals and sanitation related issues are used to supplement mathematical concept learning. However, these contents never convey explicit environmental messages or manifest environmental meaning. The understanding emerged implies that Afan Oromo and Mathematics subjects incorporated some and limited extent of EE contents and issues respectively as compared to Environmental Science, Integrated Science, Social Study, and Biology subjects.

Thus, the EE contents and issues covered in mathematics subjects can be considered as insufficient; for they are small in number and mainly used as examples and learning aids. Therefore, the contribution of EE components considered in the subjects to environmental understanding, care and protection (education in, about and for the environment) is doubtful. The impressions from analysis result uncover emerging and missing issues. Among these the following are included:

### **C E. Emerging Issues**

#### **Conceptualizing Environment:**

The environment as a concept is not explained enough in primary school subjects. This is because the term is only defined in biology textbook.

It is explained as follows:

አካባቢ በዘአካላት ዙሪያ በመገኘት ተጽዕኖ የሚሰጥባቸው ነገሮች ሁሉ ነው። ለምሳሌ፤ ሙሽጌ ዘአካላት በተፍጥሮ የሚራቡት መራባት የሚያካሂዱበት ስፍራ ነው። በ ውሃዊ እና የብሳዊ ሙሽዎች የሚኖሩ ህይወት ያላቸው እና የሌላቸው ነገሮች ተደጋጋፊዎች ናቸው (Bi, 7<sup>th</sup>, p.137).

According to the above Amharic version, “environment refers to everything that surrounds organisms and affects them; for instance, habitat is the natural place where organisms live and reproduce their species; and both aquatic and terrestrial inhabiting livingthing and nonliving things are interdependent”. It is imperative that environment is perceived objectively as phenomena surrounding organisms thereby implicitly tend to disconnect humans from natural environment. This inevitably has implication for environmental understanding and protection.

### **Environmental Ethics and Scientific Values:**

The textbook review result showed that modern ethics and values have been covnsidered in biology textbook. It was also found that care and respect for environmental aspects notably organism message is included and conveyed at least once in a unit presented Environment. This is asserted below:

በአካባቢያችን የሚገኙ ሙሽጌዎችን ለማጥናትና ለመረዳት ነሙና መጠቀም አለ። ሂደቱ፤ የአጥንት አላባዎችና የእንስሳት ናሙና ለመሰብሰብ ኬሚካልን መጠቀም አጠያያቂ ነው። ለተፈጥሮ ህይወት ርህራሄ እና ክብረ ማሳየት እንዲሁም ኢንክብካቤ ማድረግ ያስፈልጋል (Bi, 7<sup>th</sup>, pp. 142-143).

The details of the above version(this is meant to reflect the context- in town like Jimma Amharic is also used as language of instruction) inform us that “in order to study and understand habitats found in our environment sample approach is applied; in such process of collecting samples/specimen as used for insects, spraying chemicals is undesirable”. It is claimed that “mercifulness; respect and care must be demonstrated for natural lives”. The notion of respecting all living creature and protecting food producers contrasted to consumers is clearly revealed. The ideas of mercifulness; respect and care for small animals like insects manifested and the position held against the application of chemical during specimen collection for research purpose is only infused in biology subject. This is the desirable aspect of EE because the message exhibited respect for the elements of environments which corresponds to environmental ethics. The scientific values specified in biology textbook thought as means of fostering capabilities in learners is expressed like this:

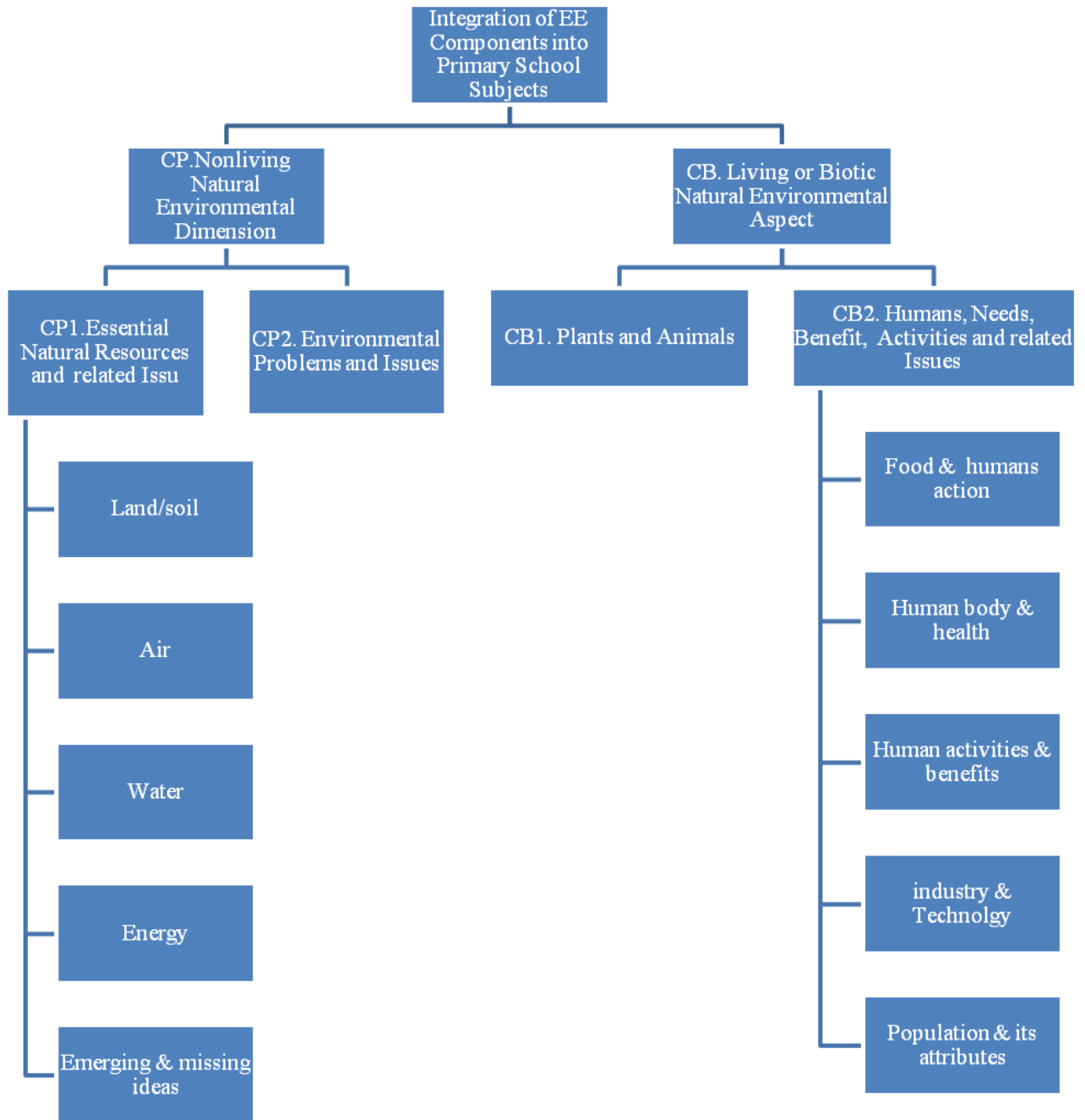
*Barnoonni baayyoolojii, bu'aa gabbina amala saayinsa'wa fi qorannoo itti amanuu uumun ilaalch fageessani yaadu, sababeessuu (rational) fi rakkoo hiikuu fida* (Bi, 7th).

According to the message, “scientific values” reinforced by biology via experimenting and researching implants significant values such as farsightedness, rationality, problem solving”. These aspects are desirable and go with the environmental education goals, and if well considered in all subjects it could contribute to the prevention of environmental problems.

This point represents emerging understanding drawn from data analysis. The structure of integration EE contents in textbooks tend to reflect patterns of magnifying informational learning or knowledge with *little regard to process and real* environmental learning which are pertinent to the students’ interest and real life. For example, on top of the conceptual information emphasized, it was identified from the concluding assignment (ES, grade 4, page 51) that none of the nine essay questions included represent reasoning and practice driven tasks than factual information related exercises. The learning activities and assessment strategies are of oral and written oriented, no much field based strategies and experiences designed. The analysis result also suggests that in most of the reviewed subjects content information coverage is more focused compared to learning experience in the textbooks. Then I could argue that designing less engaging learning experience and emphasizing content information fosters textbook learning-a learning that is confined to textbook contents.

Then, the major EE topics and contents incorporated in the primary schools curriculum could be summarized as representing the foregoing environmental messages conveyed.

The following illustration summarizes the components integrated and their interrelations.



**Figure 4:** Summary of EE Contents and Issues Covered variedly into Primary School Subjects as drawn from the Textbook review

**Discussion:**

In summary, the findings from the curricular document content analysis and interview disclosed that the environmental contents and issues integrated at a varying level into primary school subjects comprise essential natural resource: land/soil, air, water, plants including forest, and energy on one hand and other animals, humans and their activities as well as environmental problems. Environmental problems are the effect of human-environment interaction or activities. The review result also revealed the scarcely treated local or indigenous environmental experience or knowledge and modern environmental ethics in limited subjects like Afan Oromo and Social Studies (indigenous environmental experience) and Biology (environmental ethics). Then the result partly can be compared to the observation of UNESCO, (nd) that perceived environmental dimensions as biophysical world having components that include: landscape, air, water, wildlife as well as energy. One could note the interdependence prevailing among these environmental elements which is implicitly suggested. In this regard the same source claims that energy radiated from the sun and trapped by green plants, is the ultimate source of power for all ecological systems. Hence, the cited result is partly related to my study in exploring major natural environmental components and revealing their interconnection. In this regard how these dimensions of learning areas integrated and taught in holistic way is a focus here.

The study conducted by Abe (2002) on some Asia – pacific countries investigated the need for incorporating EE contents that cover environment and development in harmonious ways. It corroborates with the present study on the topics and contents to be integrated in environmental learning and disclosed the interconnection existing among environmental components. However, in the present study, subject content focused and textbook centered curriculum structure suggests a varying consideration given to the model education in, about and for the environment while education about the environment is more favored compared to education in and for the environment.

The study result further confirmed that environmental education components are covered into primary school subjects at varying level and emphasis. It was found that EE components are sufficient in coverage in some subjects such as Environmental Science, Integrated Science, Biology, and Social Study. The implication suggests that in a refined sense EE components are relatively sufficiently integrated into biology part of science subject and geography part of social

studies subjects of primary school. Whereas, other primary school subjects like Afan Oromo incorporated some of the environmental education contents and issues; still subjects such as English and Mathematics integrated limited EE contents and issues (Table.2, 2.2, Appendix 4). Pertaining to the subjects less integrating of EE components I could argue that, there is a common understanding that every school should foster proper environmental understanding and protection capability in the learners. Thus, based on their structure, these subjects can incorporate environmental aspects that can be used to communicating environmental message and supplement their respective subject matter conceptual learning. The environmental topics, contents and issues, integrated into hosting subjects with more environmental education differently comprised essential natural components of air, water, soil(land), energy resources(nonliving aspects) and plants(vegetation), animals, and humans (living environmental dimension) including human activities and related environmental problems (fig.4). In addition to those cited above, similar and contrasting research findings to this study have been identified. In this regard Palmer and Neal, (1994) indicated difficulty of defining the content of EE owing to its holistic nature, but claimed that it must at least be considered in its totality to incorporate features of rural and urban, technological and social, aesthetic and ethical issues. This view aligns to the present study notion partly in recognizing the integrative or connectedness of different subjects and revealing contents of EE to include natural (may be represented by rural aspects where people are concerned about nature relatively) as Workineh (2001) disclosed and built environmental aspects (e.g. urban area) and values. However, observation of the Palmer and Neal tended to reflect eclectic contents and deemphasize the natural environmental dimension. This is because urban, technological and social may exemplify cultural environment that is consistent with human or anthropocentric view.

Similar findings have been reported by Lydia and Peter, (2013) that investigated mainstreaming of topics on global concern towards the environment, social impact on the environment and methods of conserving the environment in the Kenyan school curriculum. But differently these findings did not explicitly identify the disparities of EE components magnitude and emphasis by learning areas and levels so that implication can be thought-out. Another study conducted on primary school (in Tanzania) found out unequal treatment of EE contents into all subjects and identified prevalence of more environmental contents in science, social studies and geography than others primary school subjects(Lydia, 2011). The finding cited supports the present study results to certain extent but

differ in emphasis. The present study considered curricular issues as well as teaching-learning practices of EE components while Lydia emphasized EE integration at teaching-learning level. Moreover she did not clarify the reason of disparity of the scope EE contents characterized in primary school subjects. However, the present study attempted to examine the underlying reason of difference in EE components coverage by subjects, and this is illuminated in the following account.

The level and emphasis of environmental education components difference among primary school subjects was resulted mainly because of the nature of subject matter, difference in the awareness and level of experience level of curriculum developers about EE. The interview evidence obtained from curriculum experts (triangulated by that of teachers') showed that subjects having contents matching with environmental contents and issue were found to contain more EE topics and contents contrastingly. On this point, Misso, (M) states that "integration of EE is determined on the basis of its relevance (interrelatedness), for example to the science subjects and the potential of the marked topic to carry environmental contents and issues. In other word integration occurs as long as the main topic carries the contents and issues of the EE. In similar way other participants (Emiru and Gorja) confirmed that the integration of EE components is based on the matching of EE with topics and content of the hosting subjects.

Thus, even though education and training policy and curriculum framework of Ethiopia recognize the integration of EE into all school subjects at all levels of education and also curriculum experts and teachers hold positive views, the ultimate determinant of the scope of coverage and depth of emphasis of EE and environmental sustainability components seemed the nature of subject matter and the carrying capacity of each subjects. Linked to this disparity in the coverage of EE components and environmental sustainability, awareness and experience of curricular developers also were reported as contributing gap to the difference. Correspondingly it is also noted that experts and teachers of subjects incorporating sufficient environmental contents and issues exhibited better awareness about environmental matters (e.g. conceptualizing environment, environmental learning, and sustainability etc) as compared to those of subjects incorporating limited environmental contents and issues.

Moreover, the interview evidence showed that the process of textbook preparation and the restricted roles of curriculum experts to edition and absence of clear integration criteria and hosting body of cross-cutting at center all were perceived as additional limiting conditions to the integration of EE into school curricula. It is imperative that the preceding observations are the gaps identified from the qualitative investigation. This has to be viewed in terms of the conceptual framework components (mainly Education *in*, *about* and *for* the environment and related concepts). Absence of particular coordinating body at the federal level and lack of clear criteria to emphasize and integrate EE and sustainability component into school subjects as deterring factors seem sensible result to suggest direction of what to teach and how to deliver it at primary school. Lydia (2011) explored constraint that goes with this study finding that depicted lack of clarity on how EE is integrated into the curriculum, and implied a curriculum developer concern related to absence of clear specification of EE elements in the school curriculum.

The question of EE contents appear debatable related to the EE nature and complexities of environmental problems and issues. Yet, Palmer's (1998) idea deserve attention in this regard, where she claims any curriculum review to examine the sufficiency of EE into primary school should be guided by seeking answer to the question- "do students have as many opportunities for EE learning by observing, measuring, recording, interpreting and discussing what has been observed". Importantly, what Palmer emphasized is the three integrative "threads"- education about, in and for environment need to be generally recognized for EE content decision. The present study also draws to this view and attempted to see the contents whether sufficient environmental contents and message is provided with meanings to develop understanding and knowledge (education About the environment); enabling learn how to learn about the environment and its sustainability using environment as context or stage (e.g. as laboratory) and resource (education In or From environment); and contributing to value development( informed concern) that in turn affect behavior through involvement(education for the environment). In this sense the present study result revealed that EE components appear sufficient (Misso, Legesse) relatively in the first cycle (1-4) of the primary school curricula compared to the second cycle (5-8). This can partly explained by the difference in the approach of organizing the subjects' contents- it is somehow integrated at lower primary (e.g. environmental science) but less integrated and linear at upper primary (e.g. social study and physics).

Abe (2002) and Fitzgerald (1990) found out limitation or ineffectiveness of EE integration into primary school curriculum. Fitzgerald reported reasons for ineffectiveness of EE integration into the Ethiopian traditional syllabuses and illuminated: time pressure, lack of teaching materials, preparing students for national exam as constraints. Abe on his part revealed that conceptualizing EE also restrains its integration. He claimed that EE is a dynamic concept and fitting this dynamic process into a static curriculum is impediment to the integration. Differently a study based on research result review (Aklilu, 2012) revealed that EE issues have been adequately integrated into primary school subjects though inconsistent by levels. The finding partly appears conflicting to the present study, because except implying inconsistency of integration of environmental issues by levels, the former did not explain the issue coverage and the emphasis of message described by subjects but claimed the adequacy of environmental components into primary school curriculum.

The curriculum document review evidence further showed that indigenous environmental knowledge and values have hardly been infused into a few primary school subjects notably Afan Oromo and social studies. Most of the interview participants ascertained that limited environmental indigenous or local experience has been incorporated in a few subjects (Misso, M, Legesse, M), while other claimed the existence of some local experiences in certain subjects (Lungo, M). Studies conducted in Ethiopia focusing on indigenous environmental knowledge and experience of the communities assured the existence of sustainable customary environmental management. Among these, the finding on traditional practices of forest resource conservation in Jimma (Kitessa, 2007); the findings documented on insights and ethics contained in indigenous belief and values of Oromo community about sustainable environmental management and protection in Guji, (Dessalegn, 2014), Borena (Teshome, 2013), Ambo, (Workineh, 2001), and Ilu Aba Bora, Dixon and Wood, (2001) nearly in similar way disclosed the rich pro environmental lived experiences and practical knowledge the community possess.

Workineh found out that Oromo people possess accumulated practical knowledge of their environment (e.g. soil, water, vegetation, wildlife management) through long stayed experience and productive activities. It is identified that the positive attitude toward natural vegetation/plants manifested is rooted in the belief and values the community held such as big trees symbolizing respect and happiness and perceiving trees as children of *Waaqa* (God). Thus claim that earth can only respected with its trees, where green environment is seen as symbol and presage of fertility

(germination and vegetation) and all good things and green environment is regarded as source of life.

A study carried in Ilu Aba Bora by Dixon and Wood (2001) revealed that farmers involved in the study exhibited knowledge about the changes in soil fertility or hydrological conditions using wetland and plants as indicators. The finding further verified that wide spread of plant-Kemete (*Leersia hexandra*) is taken as indicator of decrease in soil fertility and the need for normal flooding and fallowing; while plant-inchinne (*Triumfetta pilosa*) flourishing is seen as manifestation of increase in soil fertility and its appearance in a wetland is regarded as end of a fallow period. In similar vein Kitessa's, (2007) finding pinpointed that the local community of Jimma zone involved in the study are well aware of the value associated to forest and use traditional conservation approach for bigger trees such as *Ficus Vasta*, *Podocarpus falcatus*, *Ekebergia*, *Capensis* and *Ficus sychmore*. However, such useful and pro-environmental experiences was eroded owing to the impacts (Feyera and Demel, 2003 as cited in Kitessa, 2007) related to political and economic changes in the society in the last four and five decades. In spite of this fact, the author ascertained that traditional conservation practice of plant or tree species mentioned are respected by the community because of their traditional association with the trees.

The implication of present study finding and the reviewed empirical evidence suggest that though grateful and rich indigenous environmental knowledge prevails in the society it is not well studied and included in the school curriculum that is why environmental IK appear scanty in the primary school curriculum.

Currently integrated curriculum is perceived as appropriate approach to environmental education teaching-learning process. Franzie Loepp (1999) in favor of this observation stated that holistic or integrated models are recommendable, particularly for primary level learners this approach seems developmental appropriate and relevant; authors with similar notion are numerous (e.g. Fogarty, 1991; Robertson and Kurgly-Smolska, 1997; Palmer, 1998; Abe, 2002; Drake, 2007; Klein, 2009). Fogarty conceived integrated curriculum as having layers or continuum of 10 levels: this includes, 1. fragmented, 2. connected, 3. nested, 4. sequenced, 5. shared, 6. webbed, 7. threaded, 8. integrated, 9. immersed and 10, networked. These levels reveal how integration of curricular components move from integration within separated subject (isolated or discrete knowledge area

(fragmented) through interrelatedness and complete unification where the discipline boundary is broken and subjects lose their identity (e.g. the 8<sup>th</sup> level-integration) to the integration that takes place in the minds of learners which is also known as real integration perhaps that approximate the real world problems(e.g. the last level-networked integration).

#### **4.2. Approach of Integrating EE Contents and Issues into primary School**

The way of incorporating EE contents and issues into the subject textbooks reviewed, was found to be integrated model in the lower primary subjects (1—4) but appear linear or disciplinary in upper primary (5—8). For example, unlike the language subjects and mathematics, environmental science and aesthetics of the lower primary subjects are based on integrated approach (some how complete or broad) design of learning areas. It was understood from interview evidence and syllabus review that the topics, contents, issues, concepts and corresponding messages were drawn from different discipline area respectively. Contrastingly, integrated science and social studies subjects followed sub integrated approach from upper primary level. The notion of sub integrated is used here to show its distinction from complete integration because the previously a holistic subject which integrated, Environmental Science is split or differentiated into two: as integrated Science that covers natural science learning areas on one hand and social study and civic education representing social science learning areas on the other.

These segmentations could be considered as sub integrated or partial integrating approach. Hence, EE contents and issues can be claimed infused in 1-4 level subjects in integrated way while structured in sub integrated and compartmentalized approach for 5-8 grade levels. The evidence from textbook review revealed that except a few, subjects structured in integrated way simultaneously were found incorporating sufficient environment contents and messages. Environmental Science, integrated science, social study and biology are instances of subjects integrating EE at sufficient level. In this regard it worth noting that because of the holistic nature of EE, integrated way of curricular making possibly could contribute to incorporation of environmental components. Shoemaker (1991) seems supporter of this position where he contends curriculum integration is a means of making education meaningful, teaching-learning holistic and interactive as well as reflecting real world.

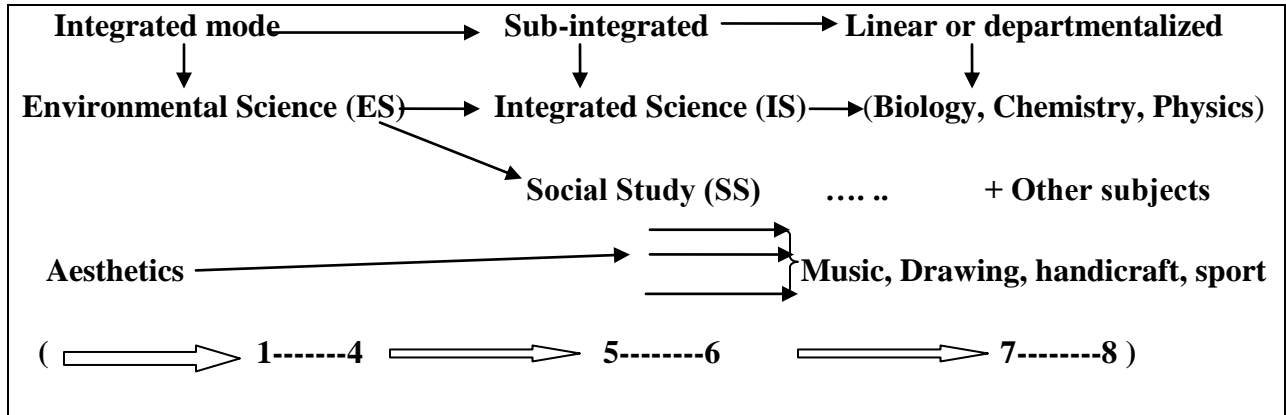
Integrated science focusing on natural science learning area designed for grade five and six, further classified into linear-independent subjects of biology, chemistry and physics for grade seven and eight. On the other side social science learning area has been structured as social study relatively with sufficient environmental education components for the whole upper primary (5--8) grade levels. The interview evidences obtained from curriculum experts (e.g. Misso, M) confirmed that EE is incorporated into primary school subjects in integrated way in lower primary and relatively linear discipline based in upper primary. It is further claimed(Gorja, m) that environmental components are infused into all subjects of 1-4 and 5-8 grade levels differently as integrated and linear form respectively while maintaining the continuity of content areas. The in-depth interview evidence received from curriculum experts coordinating official summarizes the preceding assertions. According to the indepth interview evidence (Jale, M), “due to increasing number of school subjects and corresponding informational messages, integrating EE components into all primary school subjects is appropriate”. Supporting integration approach, Jale further argued that “irrespective of the size of information to be conveyed, none of the primary school subjects are enabling children learn in in-depth and meaningful way”. This implies the subject matter information coverage should be treated indepth and made relevant to learners reality suggesting that in holistic or integration approach subjects can be interrelated and made meaningful.

In similar vein other participants talked about the absence of clear guiding criteria for incorporating EE component and perceived it as impediment to the integration of EE into primary school curriculum (Bayu, Gorja). It is also claimed that “the integration of EE into all primary school subjects (Misso, M) is determined on the basis of its relevance (interrelatedness) to the science subjects (for example) and the potential of the marked topic to carry environmental contents and issues”. To say differently, integration occurs as long as the main topic carries the contents and issues of the EE. The result revealed that integration of EE component into other subjects is only possible when matching to the host subjects’ topics and environment related contents is possible. Added to this, according to the participants are differences in awareness and experience about EE integration into primary curricula among experts reported as having implication on the integration effort.

Apparently I could foresee then, this reflects the less attention given to EE components in the light of the prevailing national and international environmental concern and context. Possibly, the interdisciplinary nature of the EE and the disciplinary trend of the most Ethiopian school subjects

of which primary is a segment, appear contentious to the holistic-integrative model of EE that is assumed to foster meaningful environmental learning.

Perhaps the next illustration could visualize the approach followed and interrelations of subjects.



**Figure 5:** The Trend of Integration of EE Approach into Primary School Subjects. Devised from textbook and syllabus review evidence by the investigator

Literature and empirical study review results tended to show similar finding as the present study. Sources such as (UNESCO, (nd); Michael, 1991; Abe, 2002) favored integrated model of EE planning for primary school curriculum. For UNESCO primary school is perceives as the natural place to introduce children to EE for their view of the environment is holistic and they are not prepared well for compartmentalize learning. The study results of Asia-Pacific (Abe, 2002) and Kenya (Michael, 1991) nearly in similar way explicated that EE and environmental messages are incorporated / introduced into school curriculum as a wide range of subject areas. For (Franzie Loepp, 1999) too, holistic or integrated models are recommendable, particularly for primary level learners this approach seems developmentally appropriate and relevant

The study also revealed that the primary education level children developmental maturity appeared matching to the holistic nature of EE to be integrated into primary school curriculum. Thus, the education in, about and for the environment model proposed makes sense here where emphasis should be placed on learners environment and real life experience while designing and teaching environmental contents and issues in other subjects in integrated manner. However, the observed integration approach involved in the incorporation of EE elements into primary school curricula (see figure 5 above) characterize three forms: integrated (complete integration), sub (prtial)

integrated, and disciplinary (linear). In this regard, Environmental Science and Aesthetics of the lower primary exemplify application of integrated model to EE into other primary school curricula. Integrated science and social studies characterize subintegrated as designed for 5--6, and 5—8 grade level respectively. On the other hand linear or compartmentalized approach was identified as designed for 5—8 level. For example language subjects, mathematics, civics, physics, chemistry biology etc. represent linear or department (discipline) oriented incorporation of EE elements. Biology is found uniquely infusing sufficient environmental elements though it stands as separate or discrete subject. The EE integration approach identified in the present study appear corresponding to integrated, connected and fragmented levels of Fogerty's (1991) curriculum integration continuum respectively. According to Fogerty, fragmented trend refers to the first level and represents separate discipline, clear and discrete view of a discipline. Connected level verifies connection of topics within a discipline, where key concepts and issues are connected involving assimilation of ideas within a discipline; while integrated level entails pulling concepts, ideas, skills and values from multiple disciplines with overlapping concepts and issues. It is believed to realize more connectedness and interrelationships among disciplines and also perceived as interest stimulating. Contrasted to fragmented level, networked level is the last highest level of Fogerty (1991) model. Networked level is learner directed integration through their proactive effort and selection of network of experts and resources. This point of view shows the inevitability of extending of EE components into the teaching and learning level via the opportunities created for meaningful learning. In this case learners reorganize, interrelate ideas within and between the separate disciplines as well as ideas and learning strategies with and between learners. In this connection it is apparent that partly the subject/discipline oriented school curriculum of Ethiopia seem inconsistent to the preferred approach of EE integration. The K-12 curriculum framework (MoE, 2010) suggests and specifies learning areas for Kindergarten, Primary and Secondary curriculum. For example, it provides frames of reference for subject syllabi design for 1-8 grade levels. Related to this, Wragg (1997) argues when there is national curriculum, the form of contents of subjects is determined at the center.

Differently a case study conducted at Sechaba primary school in South Africa (Sekinah, 2010) disclosed that localized policy is perceived as important in driving the integration of EE into the school curriculum, but also identified gap in the depth of conceptualization of the integration and

extended participation of learners in EE. This empirical evidence though differs from the present study by level of curriculum making (central or local) but shares limitation in extent of EE conceptualization and learners involvement in EE. Critically it is claimed that integrated model is recognized important for EE structuring in the primary curriculum (OMoE, 2009 cited in Karrow and Fazio, 2015) that integrated model is advocate for EE; because integrated curriculum portrays attributes like holistic, connectedness, embodied, ecological and unified knowledge, relevancy to real world, and having epistemological, students learning and pedagogical importance that EE also shares (Beane, 1996; Palmer, 1998; Drake, 2007; Karrow and Fazio, 2015) as contrasted to traditional discipline based curriculum. Traditional subject based curriculum on the other hand stress contents and enhance memorization of that content, thus characterize (Beane, 1997; Paterson, 2003, in Etim, (edit), 2005) “fragmented knowledge and non responsive to students needs”. In this case, though the experience of discipline based approach (as independent) to EE also prevails in other setting (Lydia, 2011) integrating EE into all school subjects is favored in Ethiopia atleast theoretically but in practice the incorporation of EE elements tended to reflect the feature of integration continuum.

For triangulation purpose curriculum experts (central and regional levels) have been consulted for their perceptions and roles related to the integration of EE into primary school curriculum. Thus the presentation and discussion of the result involves embedment of evidences for cross accounting via fore and back seeing. The forthcoming interview evidence analysis and interpretation and discussion intended to supplement the evidence coming from the curricular documents and extended as part two.

### **4.3. Curriculum Experts Perceptions and Roles in Integrating EE into Primary School Curriculum**

#### **4.3.1. What Environment, EE and environmental Sustainability mean for Curriculum Experts**

It is believed that the way curriculum experts conceptualize key terms like environment; EE and sustainability affect their views and practices. Subsequently how these concepts are understood by expert was sought for and presented.

### **The Concept of Environment:**

The analysis result disclosed that environment is understood differently by curriculum experts. The evidence revealed that environment was understood as objective space surrounding humans or children on one hand and as thing that contain the resource on which humans live on the other. The varied conception of environment by experts may be related to difference of specialization areas.

### **Environment as Entity Surrounding Humans**

The curriculum experts conceived environment as everything around the student in the context of primary school education. This is justified by two of such observation:

“Environment is everything around child, particularly in the context of lower primary school; environment can be understood as everything around the child” (Misso, M).

“...Environment may refer to students’ surroundings that include physical, biological and socio-cultural issues” (Gorja, M).

According to experts utterance environment is considered as everything around the child and as place of living or surrounding that incorporates biophysical and socio-cultural aspects. As can be noted from quotes considering environment as constituting everything around the child coincide with the nonliving and living conception of environment. The manifest meaning sensed suggests couple of views: one, environment is viewed objectively that can be vividly observed surrounding the learners. Two, the child who represents humans is perceived as independent of the natural environment. That is because ‘everything around the child (humans)’ does not seem reflecting inclusion of humans in the elements of natural environment. It is inferred from the result that objective conception of environment and failing to consider humans as part of natural environment may impose implication on the way environmental education is understood and integrated into primary school subjects. For instance seeing human being independent of environment reflects the view of human dominance over natural environment.

## **Environment as foundation of Resources**

For the remaining experts environment is source of natural resources required for humans' survival. This is evident from the next expressions: "Environment is considered important for our life depends on it; we get resources and means of life from our environment" (Emiru, M).

It is apparent from the above evidence that the environment is perceived as foundation of resources on which humans live. The emerging understanding suggests that environment is understood as space constituting resources which sustain humans. Hence, it could infer that environment and its elements deserve care while utilizing. However, humans are not considered as part of natural environment and interdependence prevailing among important components of the environment never implied. Nevertheless, in reality, none of the elements of the natural environment stand in complete isolation. Consequently, this has its own implication on the understanding of EE and its integration into primary school subjects.

It is evident that curriculum experts' conceptions of environment encompass viewing it as everything surrounding humans to biophysical and socio-cultural surroundings of the humans from where they obtain life sustaining resources. The failure to depict the interdependence between humans and the natural environment undesirably disguises the literacy path to the living in harmony with environment. In line with this notion, two sources critically argue about the interconnectedness of humans and their natural environment. Irish National Teachers' Organization (INTO, 1992) states, "All things are like the blood that unite one family..., man did not weave the web of life. S/he is merely a strand in it. Whatever s/he does to the web s/he does to her/him". It is clear from this claim that like blood interconnects a family with its natural intertwined web so are all components of natural environment including humans. This further implies that affecting the relationship among the constituting elements (web) is like harming oneself. Examining curriculum experts' understanding and view is undoubtedly related to EE conceptualization its integration into school subjects.

Teshome (2013:164) drawing to literature review and Borena Oromo environmental beliefs came up with understanding that he elaborated: "humans and environment take a relatively equal status and one cannot exist at the expense of the other; humans loyalty to and interconnectedness with nature occur as humans understand that they belong to nature and are mutually dependent on it. Consequently defending and protecting nature is critically important to their well being". It seems

this understanding is lacking as implied both in the curricular document evidences and the preceding environmental conceptualization by participants. In this context, the next concern should be what environmental education and environmental sustainability mean to the curriculum experts or officials.

### **Environmental Education**

The interview evidence elucidated that EE and environmental sustainability are not directly used in primary school curricular materials. Instead, according to some experts, environmental science is known as designed for the lower primary school. Thus, the ideas of environmental contents and issues were apparently manifested during the interview communication. This view is reflected in the following way:

Our primary educational system treats environmental issue and contents in environmental science not as environmental education. In lower primary school [Grades 1-4] particularly environmental components are delivered in integrated way comprising content areas from different disciplines and presented as environmental science. Integration is assumed to help students understand their environment and its components in a broad and meaningful way. Environmental sustainability is not noted in English language curriculum of the primary school level for example (Legese, M).

According to the above data the idea of environmental education is implicitly represented by environmental matters and issues study which probably under weigh the emphasis and goals of EE intended at all levels of schooling. The interview further assured that environmental sustainability is not a common concept in primary school subjects like English. The implication emerged suggested the less emphasis given to EE and sustainability matter. Along similar angle of discourse other experts claimed that the idea of environmental sustainability implicitly represented by content and issues coverage. The following evidences explain this point:

I believe that sustainability is considered in different level in the subjects like Afan Oromo. Environmental concern and sustainability appear fairly reflected in the textbook in this subject. These can be noted from the values, history, natural resource; health care etc related topics duly covered in the textbook (Lungo, m).

Idea of sustainability is reflected in science subjects of the primary school...take for instance inclusion of contents such as conservation of endemic animals' rehabilitation of the degraded lands in subjects like biology. Moreover, co-curricular activities based awareness, care and protection for the environment is among the attention given (Bayu, m).

According to these participants the idea of environmental sustainability can be understood from contents and issues pertaining to environment incorporated into the primary school subjects. Thus,

the understanding emerged suggests that though the experts have understanding of the notion, of environmental study and sustainability, it seems that the concepts are not clearly surfaced in the curriculum under investigation for viewing it in terms of subject contents is not enough. Therefore since the idea of environmental sustainability is only sparsely recognized by curriculum developers, it follows that Education for Sustainable Development (ESD) cannot be as familiar as EE to subject experts. Moreover, there could be little doubt to think that the ways the key concepts such as environment, EE etc. are understood affect the integration and teaching of EE contents and issues into primary school subjects. Consequently, I could argue that inconsistency in identification and conceptualization of key terms pertinent to EE suggests the prevalence of vagueness in understanding and considering these components. Moreover, contrastingly it is worth noting that curriculum experts' role restriction to editing level of curricular material in the process of curriculum development could be regarded as one of the setbacks.

In connection to experts' perception about the integration of EE into primary school curriculum and the approach to follow, their role, and challenges involved and suggestion forwarded were examined and presented in the following sub-sections.

#### **4.3.2. Perception of Curriculum Experts about the Significance and Approach of EE Integration into Primary School Subjects**

It is assumed that curriculum experts' perception regarding the need of integrating EE into school subjects and the approach they accept can provide verifying information in the light of evidence obtained from curricular documents. In this regard the interview result showed that different views have been held by curriculum experts in that most of the participants exhibited positive attitude towards integration of EE into all primary school subjects with a few hesitant. In this regard one of the experts (Misso, M) explained that "integrating EE into primary school subjects has both national and international acceptance, our own actual natural concern, situation and real environmental problems, (e.g. environmental degradation, drought, pollution etc), in particular forced us to integrate environmental education components and teach our new generation starting from primary school". Consistent to the above idea, the reason for integrating and teaching EE in the primary school is justified by another participant as follows:

The importance of EE component integration into school subjects is recognized in our system, because environment is vital in supporting life on the planet and it is also considered as cross cutting issues in Ethiopian education and training policy document (Emiru, M).

Though, all experts do not seem equally well informed about environmental matters, the ideas of those consulted revealed that integration of EE into school curricula has both theoretical and practical ground. Theoretically, EE has been internationally initiated and agreed up on and nationally accepted and supported by policy; practically the real environmental situation of the time and the actual environmental problems confronting us urge all to consider EE.

However others showed mixed stand on this matter, demonstrating uncertain position contrasted to those claimed acceptability of EE integration into all primary school subjects. These participants seemed questioning the practicality of integrating EE into all school subjects, specifically they argue:

EE is not integrated in required level in subjects like mathematics. I don't think incorporating EE contents and issues in mathematics is feasible, even if tried it is challenging due to the discipline's specific attribute for it focuses mainly on problem solving . No special framework available to be used while preparing primary school textbook at regional level the role of expert is curriculum designing where the focus is developing the material according to the international and national standard (Mathiwos, M).

Integrating environmental issues into all subjects is theoretically recognized; but practically, due to capacity and cost, integrating EE contents and local experience does not seem as effective as intended. The reason behind intending to make students learning environmental or relevant to their real life is to make learning understandable, through the use of immediate examples and contents (Lungo, M).

With slight difference both participants demonstrated awareness about the significance of environmental learning but doubted about the practicality of the integration of EE into all school subjects. Mathiwos strongly contended that integrating EE topics into subjects like mathematics is challenging and seems impractical. He seemed attributing this to the following conditions: one, subject matter nature, mainly its problem solving orientation, two, unavailability of criteria to direct the integration, three, loose concern sensed about the alignment of policy directives and curriculum development process. Likewise, (Lungo) claimed that, integration of environment contents and issues is theoretically recognized but practically EE components and local environmental experiences appear inefficiently considered in primary school subjects like Afan Oromo and English. He illuminated that integrating environmental issues and local experience into Afan Orom subject is influenced by shortage of skilled human power and financial resource at

regional level. Hence, from the evidence obtained I learned that within predominating tradition approach of curriculum making; it is implicitly sensible that the policy framework is concealed by the emphasis given to discipline specific standards. At the same time it was reported that indigenous or local environmental knowledge pertinent to environmental matter noticeably recognized by some experts was practically less regarded.

It was found that for connecting EE (interdisciplinary) and other primary school subjects (disciplinary) integrated approach is favored by curriculum experts. Two of these views are given below:

For 1-4 level elements from learners surrounding are incorporated as EE topics and issues in broad term or integrated broadly including relevant social and natural phenomena, without compartmentalizing. But as grade level increases the broadness of subjects' decreases and the subject tend to become specific and take their discipline nature. For example for 5-6 the science subjects are structured in one as integrated science, while for 7 and 8 grades the three science subjects independently designed as pure biology chemistry and physics.(Misso, M).

Environmental components are incorporated into all subjects of 1-4 and 5-8 grade levels differently as integrated and linear form respectively, yet the continuity of content areas being maintained as much as possible (Gorja, m).

Even though there existed different ways of structuring environmental contents and issues into primary school curricula, curriculum experts stated that based on the prevailing school subjects trends, the approach range from broad to specific integration in lower and upper primary school subjects. Moreover, the interviewees revealed factors like the absence of clear criteria, discipline focused views of experts (e.g. vertical integration), integrating EE contents to related topics of other subject (Gorja, M; Bayu, M) could be perceived as influencing to the integration of EE into primary school subjects.

#### **4.4. Emerging Issues**

It was found that key terms related to EE were meagerly conceptualized; the interdependence existing between natural environment and humans was not revealed explicitly. Humans were not regarded as part of natural environment. However, humans' survival is inevitably dependent on the relationship the environmental components have with each other: living things (e.g. humans included) with nonliving things. Thus, it is logical to expect undisrupted and harmonious

relationship among these components of the natural environment, if environmental sustainability is to be maintained. Such information should be communicated to students via curriculum.

The result disclosed that relative to environmental topics and contents addressed in textbooks analyzed, the concept of environment is only stated in biology textbook. It is illuminated as follows:

እካባቢ በዘአካላት ዙሪያ በመገኘት ተጽዕኖ የሚሳድርባቸው ነገሮች ሁሉ ነው። ለምሳሌ፤ ሙቅ ዘአካላት በተፍጥሮ የሚራቡት መራባት የሚያካሂዱበት ስፍራ ነው። በ ውሃዊ እና የብሳዊ ሙቅዎች የሚኖሩ ህይወት ያላቸው እና የሌላቸው ነገሮች ተደጋጋፊዎች ናቸው። (Bi, 7<sup>th</sup>). Naannooni, wantoota marsuun dhibbaa kan irraan gaa’an hundaa. Haabittatini (bakka argamaa) fakkeenyaaf, wantootn ummamaan iddoo itti walhoraanudha Bakka bishaanwa fi daachee irra wanttotn lubbu qabeeyyi fi lubbu dhabeeyyiin wal deggaruun jiratuu.

According to the above description, “environment refers to everything that surrounds organisms and affects them; for instance habitat is the natural place where organisms live and reproduce their species; it also implies interdependence of aquatic and terrestrial inhabiting living thing and those of nonliving things”. The textbook contents in similar trend demonstrate the interconnection prevailing among the environmental components and the care and respect humans should give to the other living things. This is confirmable from the additional assertion communicated in the textbook:

በአካባቢያችን የሚገኙ ሙቅዎችን ለማጥናትና ለመረዳት ነሙና መጠቀም አለ። በሂደቱ፤ የአጥንት አላባዎችና የእንሰሳት ናሙና ለመሰብሰብ ኬሚካልን መጠቀም አጠያያቂ ነው። ለተፈጥሮ ህይወት ርህራሄ እና ክብር ማሳየት እንዲሁም እንክብካቤ ማድረግ ያስፈልጋል። በስተመጨረሻ የምግብ ሰንሰለትና ቀርቦ ሰንሰለቱ ሁልጊዜ ከአረንጉዋዴ እጽዋት ጀምሮ የተለያዩ ፈጂ ዘአካላት ደረጃዎችን የሚሄድና የሚያቅፍ ተገልጽዋለ (Bi, 7<sup>th</sup>) ።

The details of the content inform us that “in order to study and understand habitats found in our environment sample approach is applied; in such process of collecting samples/specimen as used for insects spraying chemicals is undesirable”. It is claimed that “mercifulness; respect and care must be demonstrated for natural lives”. Moreover, “food chain is discussed as beginning with green plants and passing through several levels of consumers of organisms”. Here, the notion of respecting, mercifulness and care for small animals like insects and argued against the use of chemical to collect sample/specimen for research purposes; protecting all living creature and plants (producers) contrasted to consumers implies view of education for the environment. This is the desirable aspect of EE because the respecting and protecting intent for the elements of environments exhibited in message correspond to environmental ethics. This point represents emerging understanding drawn from data analysis.

On the other hand, the conception of “Environment as everything around the organisms” reflects the objective view of environment which tends to detach animals notably humans from the natural environment. This view appears contradictory to the interdependence of all the elements of environment and the need for proper understanding and care for natural environment and its components. However, the textbook also reflected ideas of showing

The structure of integrating EE contents in textbooks tend to reflect patterns of magnifying informational learning or knowledge with *little regard to process and real* environmental learning which are pertinent to the students’ interest and real life. For example, on top of the conceptual information emphasized, it was identified from the concluding assignment (ES, grade 4, page 51) that none of the nine essay questions included represent reasoning and practice driven tasks than factual information related exercises. The learning activities and assessment strategies are of oral and written type, no much field based strategies and experiences are included. The analysis result also suggests that in most of the reviewed subjects content information coverage is more focused compared to learning experience in the textbooks. Then I could argue that designing less engaging learning experience and emphasizing content information fosters textbook learning-a learning that is confined to textbook contents.

#### **4.5. Chapter Summary**

The EE components and messages are found to be integrated at a varying level and emphasis into all primary school curricula. The contents and issues are covered to sufficient level in certain subjects and very limited in the other primary school subjects (e.g. Appendix, 4, Table 1 and 2, pp.270-278). The subjects also varied in the emphasis they give to environmental message. In the same vein, the level of coverage of EE topics and contents and emphasis of message were found to depend on the matching of the host subject structure and EE contents and issues or learning areas. EE is incorporated into subjects in integrated way at lower primary (1—4) while in subintegrated and linear (compartmentalized) mode for upper primary (5—8) school. In other word, EE components have been incorporated sufficiently in integrated subjects(e.g. environmental science) in lower primary but in sub-integrated subjects(e.g. integrated science, social studies) and linear subjects in others(e.g. English). However, integrating EE components into primary school subjects alone is not enough unless it is supported by holistic environmental education model-education, in, about and for environment. The interview evidence obtained from curriculum experts supported

the finding derived from curriculum document review. In this regard both the Federal and Regional level curriculum experts reported (Lungo, Mathewos, Emiru, Misso) varied level of coverage of EE component into primary school subjects. EE contents and issues integration varied by subjects can be attributable to reasons such as difference in subject matter nature and structure (Mathewos, Misso), and difference in awareness and experience among curriculum developers related to EE integration into school subjects. With similar view, experts from the study region assured that Environmental contents and issues are covered in primary school subjects at a varying magnitude but sufficient in biology and geography subjects, which share common themes in most cases, and the integration of environmental contents appears adequate for 1-4 as compared to 5-8 grade levels (Gorja, M).

The interview evidence further strengthened the mixed type of integrated linear/departmentalization approach used for EE integration into all primary school subjects as identified from curricular document review. the interview data obtained from experts respectively asserted that “environmental components are incorporated into all subjects of 1-4 and 5-8 grade levels differently as integrated and linear form respectively, but maintains continuity of content area as much as possible (Gorja, M). It also contended that EE topics and issues are broadly integrated for lower primary including relevant social, and natural phenomena, without compartmentalizing yet as grade level increases the broadness of subjects’ contents decreases and the subject tend to become specific and take their discipline core structure. The science subject for instance is structured for 5-6 grades as integrated science while designed independently for 7 and 8 as pure biology, chemistry and physics (Misso, M).

In the same vein, I also identified that, most of the curriculum (subject) experts and teachers exhibited postive attitude toward the importance of integrating EE contents and issues into primary school subjects. The interview evidence revealed that EE integration into school subjects acceptance is related to the vital role environment has in supporting life on the planet and policy provision as cross cutting issues in education and training policy document (Emiru, M). The experts further reasoned out that EE is internationally recognized to be incorporated into world countries educational systems. Above all, due to our own actual natural concern, situation and real environmental problems, we are forced to consider and integrate environmental issues and contents to teach new generation starting from their early years of schooling (Misso, M).

However, other participants who held a hesitating position (e.g. Mathiwos) doubted the effectiveness of integration of EE contents into subjects like mathematics because of the discipline's nature. The difference in capacity and cost (Lungo) are also seen as a barrier to the integration of EE contents and local experiences into primary school curricula. This suggests the host subject's nature and structure; policy related matter (e.g. lack of clear integration guide reported by Legess, (M) and curriculum experts' related limitation (capacity, experience etc.) all tend to affect the integration of EE in a holistic model into primary school subjects. Consequently, EE, instead of a holistic-integrated way, is designed and taught in education *about* environment perspective which does not contribute much to the development of sound environmental literacy and environmental care as well as pro-environmental behavior in the young generation.

Moreover, the evidence from curriculum documents and substantiating interviews generated emerging issues and understandings. For example, the human-environment relationship is conceived in a disconnected way. Humans are not explained (in textbooks) or seen (by participants) as part of the natural environment. The relationship tended to be perceived from a resource or benefit extraction way from the earth or environment. This could be noted from economic activities and technological outcomes covered and conveyed in the subject textbooks (see Appendix 4, Table 1, and Table 2). As a result, a human-centric or anthropocentric view is implied in the textbooks or curricular message as contrasted to earth or ecocentric thinking. Anthropocentric view referred to understanding environment in terms of the benefit it provides to humans and considering humans as controllers of the natural environment.

Lastly, in this assertion, I also understood that EE does not seem a priority in the primary school subject context as it ought to be. I brought this claim because, though curriculum experts and school teachers relatively in a similar way tended to reveal awareness and concern about environmental matter, the concept of environment and EE for example is not explained enough in primary school textbooks except biology textbook. The concept of environment is explained only in Biology textbook of primary school. In a similar vein, environmental ethics and indigenous environmental knowledge and values appear marginalized. Sheya (2014) after reviewing curriculum documents found out similar results. The study disclosed that indigenous knowledge is not only ignored and underutilized in schools but also systematically undermined as a potential source of knowledge for development. The curriculum continues to reinforce western values at the

expense of indigenous knowledge. This situation inevitably has implications for the environmental understanding and protection where the interconnection of humans with their environment is not well considered. According to Teshome (2013), understanding environmental elements interdependence is crucial for environmental sustainability. He convincingly claimed that “humans loyalty to and interconnectedness with nature occur when humans understand that they belong to nature and mutually dependent on it (p.106).

With this in mind, to have a complete picture of the integration of EE (by connecting the curriculum level evidences secured, to the teaching-learning level integration practices) the following chapter presents and discusses the integration of EE components at teaching level.

# **Chapter Five: Analysis and interpretation of Results on Perceptions and Practices of Primary School Teachers in Teaching EE Contents and Issues in their Subjects**

## **Introduction**

This chapter presents and discusses the data gathered through interviews and lesson observations. The interview evidence has been analyzed on the basis of the research questions set at the outset of the study. The interview ended when the addition of more two participants toward the last could not bring any new point of view and meaning to the question suggesting that the data gathering process was culminated with data saturation. The evidence analyzed was intended to generate understanding on how EE components are taught in primary schools. The interview evidence was examined to identify perceptions and experiences of each participant in terms of research questions and conceptual framework set. In this regard, evidence obtained from teachers' interview and lesson observations were used to address the second basic research question and sub questions. Categories under which the concepts, issues and meaning emanated from interview evidence were organized, yet categories were differentiated by the open code 4.2 software were also partly considered. The perception and practices of primary school subject teachers about teaching environmentally integrated subjects as they report during the interview communication are the point of focus.

### **5.1. Perception of primary school Teachers towards the Integration of EE into their Subjects**

Before discussing teachers' perception, it is logical to examine how primary school teachers conceptualize important term related to EE like environment. Consequently, teacher's conceptualization of the environment is addressed below.

#### **5.1.1. Teachers' Concept of Environment**

From the oral discussions made with teachers, it was found out that the term "environment" is conceptualized in different ways. Interviews held with primary school teachers in Afan Oromo result revealed that definition given to environment can be identified as material source, natural and, natural and cultural phenomena where majority perceived environment as natural entity.

The following presents instance of the teachers' conception of environment:

**a. Environment as materials or resource**

Teachers of different subjects considered environment as materials or phenomena either as learning aid or resource to be used. For instance those with mathematics and social studies background defined environment as things visualizing or concretizing students' learning of their subject matter. This is apparent from teachers' utterance quoted below:

Environment *naannoon herrega keessatti wantoota naannoo quyyabotaa hubachiisuuf gargaaraanudha. Akka deegarsaa meeshaati malee qabiyyee ijoo ta'e miti.* In mathematics, environment includes things of the surrounding that can be used to supplement mathematics calculation, thus the environmental things are only used as learning aids not as main content (Gema5m-6).

Naannoon waanta naannoo ttiin ibsamaa kan akka Oomo, Omii, biqiltoota dirree, qe'ee... agarsiisuun shaakalchiissuu... Environment can be represented by things it contains. Like trees Omi, Gaatiraa etc. showing garden plants, and natural vegetation and engaging in exercises (GeSoS13f-8).

Evidently, these participants define environment as observable materials or things of the surrounding that represents and supplements learning. Explicitly viewed it as material aid and itemized natural thing like trees and other plants contained in the environment. From the interview outcomes two ideas were noted, objective view of the environment and the environment as material resource of teaching learning, hence suggested pedagogical implication. However, these teachers never considered environment as space and also failed to consider humans as part of natural environment.

Within the same notion, other teachers identified environment as things of setting or space where children are found. The following statements reveal this point:

Wantoota bakka ijoolleen itti argamanu, wantoota naannoo hubachiisanu kan akka nyaataa, bu'uura jireenyaa, laggeen, biyyee kkf. Environment may refer to things found where children are and used to represent environment like food, necessities of life, rivers, soils etc (MenHis13f-12).

Ija afaanin ijoolleen wantoota isaani tti dhiyoo irraa ka'uun barchuun isaan fayyada. Barnootni afaani wantoota naannoo irratti hunda'aa; In language context children learning will be meaningful if related to their immediate environment and language teaching often is environment based (SekAO17f-18).

Participants talked about things found within learners' immediate surroundings and cited instances such as food and other necessities, rivers, soils etc. as representing the environment. Particularly the language teacher (e.g. Afan Oromo) emphasized realization of relevance of learning by linking to the students' real environment. These teachers, like the previous group saw environment as observable things situated around children. The result suggests that teachers understood environment in terms of physical things including material needs of humans in a setting without regarding humans as part of the natural environment. Yet, the idea of education in the environment where the environment serves as learning stage and resource have implicitly been noted as emergent meaning. This is evident from the claims of the participants' highlighted- "use of materials of the environment, and relating learning to learners' immediate environment".

### **b. Environment as Natural Phenomena**

It was found that some of the teachers related environment to natural living things and nonliving things. Living things refer to phenomena having life (e.g. plants, animals including humans and microbes) found at different spheres of the earth while nonliving things are natural things without life (e.g. air, water, soil, minerals, energy etc). These views have been reflected in the interview conversation by participants as follows:

Hiikni naannoo akkumaa barnoota keenyaati hubatama wantooni akka biqilootaa bosona uumamaa iddoo itti argaman naannoodha. The meaning of environment may vary with the subject taught. Elements such as plants and natural forest and where they are found constitute environment (MenGeo33m-11).

Wantoota naannoo keenyaati argaman kan akka lubbu qabeeyyii fi lubbuu maleeyyii yookan qamoolee phiizikaala fi qamoolee baayyolojiika diyyaate(fkn. kitaaba kutaa 7 fi 8 keessaatti). The concept of environment may refer to living and non living things or physical and biological elements as covered in 7<sup>th</sup> and 8<sup>th</sup> grade textbooks (SekBio30m-17)

As can be sensed from the above quotes, environment is understood narrowly as places where things like natural forests and other plants are found to broadly as including both living things and nonliving things. The participant with natural science background (e.g. Sekche9m-19) implicated the need for environmental care and protection in order to obtain benefit from it. The emerging understanding implies the notion of sustainable use of the environment which is the concern of the time. However, these participants did not recognize humans as components of natural living things where all the environmental elements are mutually interdependent. Therefore, this view may have implications on the effort of proper understanding and care for environment. Perhaps the interdependence existing between humans and natural environment seemed overlooked and this in

effect conceals the environmental problems encountering all living things including humans. Moreover, objective conception of environment and humans as independent of the environment is consistent to anthropocentric or techno centric view. Obviously, this view advocates human control and dominance over the natural environment and states that all the natural resource should serve the need and life styles of humans.

### **c. Environment as natural and cultural Phenomena**

Other group of teachers perceived environment as comprising living and nonliving natural environment including humans and their culture. The following statements represent this view point:

Naannoon waantoota lubbuu qabeeyyii fi lubbuu dhabeeyyi hammata, hawaasa amala adda addaa qabanuus ni dabalaa. Environment comprises living thing and nonliving things as well as communities of diverse characteristics (Dedph8f-4).

Yes, naannoon haala teesumaa lafaa qilleensaa, bosonaafi qabeenyaa uumamaa biroo ilaala. Akka barnoota hawaasatti dabareewwan uumamaa fi nam-tolchee ni dabalaata. Kana malees, wantoota lafaa irraa jiranu hunda fi lafaa naannoo keenyaa ilaala. Yes environment includes landscape, air conditions, forest and other natural resources. In the context of social studies environment is about natural and human created heritages; hence it is about everything found on the earth and our surrounding (SekHis13f-16).

These participants mainly conceptualized environment in terms of natural phenomena and community practices and experiences. For example, according to teachers with physics and geography background indicated above, environment refers to natural things with and without life and different communities and their cultural issues. It is sensible from participants expression that environment can be understood as having natural and cultural components or elements which are interrelated. Consistent with the preceding claims, the other teacher talked about environment as referring to natural elements such as land, air; forest etc and cultural heritages including everything of our surroundings. The last conception of environment appears broader, for it illuminated environment as essence of natural biotic and abiotic things and cultural aspects of human surrounding. This group did not conceive environment as only observable entities surrounding humans but also as invisible phenomena of natural (e.g. air) and cultural types. Humans created things are considered as part of environments. At the same time, environmental sustainability is reflected in the utterance of the participant that states environment as natural and cultural heritages. This suggests the emphasis of the interrelation of humans and natural environment, which requires

understanding of environmental components and utilizing it with care so that it can sustainably be used at present and beyond. Though primary school teachers teaching EE components in their subject exhibited some awareness about environment and environmental learning EE does not seem among primary schools' focus. A study conducted by Daniel, (2007) that examined the nature of mainstreaming EE in to Teachers Education of Ethiopia explored related result. The study revealed that environmental education knowledge of the prospective teachers is inadequate, that bleak their future readiness to pursue effective environmental teaching. Subsequently teachers as passing in such trend undoubtedly could be unfamiliar to the idea of EE in its holistic context. This appears similar to Abe's (2002) observation which disclosed the ambiguity of the concept EE among the participants.

### **5.1.2. Teachers' Perception about the Integration of EE into**

#### **Primary School Subjects**

It was found that in some primary school subjects' sufficient coverage of contents and issues of EE have been reported while they are limited in others. Teachers of different subjects indicated the prevalence of varying scope of EE components integrated in their respective subjects. Integration of environmental contents into different primary school subjects is meant incorporating and connecting environmental contents and issues with the hosting subjects. Integration in this sense cannot be viewed as a single level organizing or design issue instead as Fogarty (1991) reminds us; it is a continuum that ranges from within single discipline integration through connecting between and across disciplines to networked integration that is expected to occur in the learners mind.

Most of the participants reported the prevalence of EE contents and issues in primary school subjects but their views varied regarding the scope and relevance of coverage into their respective subjects. They also claimed that in subjects like mathematics, English and Afan Oromo environmental contents are not sufficiently covered. The following interview evidence supports the assertion:

Afaan Oromoo keessaa qabiyyeen naannoo amma tokko jira; ...Afaan jireenyaa naannoo barattootaa walqabisiisuu mataduree dubbisaa keessatti hammatame jira, garuu akka ijooti dandeetti afaanii ciimsuu irratti xiyyeefata, qabiyyee naannoo barsiisuuf yeroon addaa hinjiru. Kana wajjin, Qabiyyeewwaan dandeetti barattootaa olii ta'an diyyaatani barattoota baadiyaatiif kan mijaa'u hinfakkatuu (DedAO27f-1).

The environmental content is not adequately covered in English textbook. In English we teach the rarely integrated environment related contents (MenEng32-15).

The first quote reads Afan Oromo textbooks incorporate environmental contents to some extent ..., there are contents related to the real environment of students infused in the passages but mainly focus on language skills fostering, and there is no extra specified time to address environmental contents. English is of similar nature. Some contents of English subject tend to be beyond the ability of lower primary school students; particularly, they do not seem relevant to rural children background

The evidence revealed that environment related contents are less integrated into language subjects of the primary school. The different expressions used by the participants also suggested that English is less favored than Afan Oromo in integrating environmental contents and maintaining relevance. For example the phrase “amma tokko”-to some extent used to illuminate limited environmental contents incorporated in Afan Oromo but better in magnitude than that of English. The understanding derived from the interview further suggested that the already limited environment related contents covered in language subjects mainly aimed at language skills development rather than conveying environmental education intents or messages. Moreover, the concern of relevance to learners’ context is also raised by some participants, particularly, as noted from the utterance of one of the rural setting teacher cited above. In related discourse, it was illuminated further that the English subject contents difficulty level tend to mismatch to the ability and background of the children, and mostly reflects urban features. Hence, its suitability to rural children is questioned by the participants. In the words of the interviewee it was claimed that, “qabiyyeewwaan dandeetti barattootaa olii ta’an dhiyyaatani barattoota baadiyaatiif kan mijaa’u hinfakkatuu”. Literally this refers to inclusion of contents which are beyond the students’ capacity and unsuitability of such contents to rural learning context. Mathematics was identified as subject integrating limited environmental education contents. The following quote explains this notion:

For me there are fewer EE contents available in mathematics due to the subject matter nature. *Timhirtu aygabizim*. The subject does not invite inclusion of EE contents and issues(DedPh15f-3).

The interview evidence further shows the limited coverage of environmental contents and issues into mathematics subject of the primary school. The participant contented that limited coverage of

environmental component is due to the nature of mathematics claiming that “timhirtu aygabizim” meaning mathematic subject is not amenable to environmental contents. The implication also highlights the less regard directed to integration of environmental components into the subject mentioned, attributing reason to the subject’s character. Then, I could claim that teachers tend to be bounded by discipline traditions and restricted to textbook contents and this characterizes textbook teaching. What might be noted as emerging insight along this point are inconsistency of teachers’ views and awareness, with the intention of EE integration as over arching issue into all school subjects and interdisciplinary nature of environmental learning.

The integration approach implied in the interview data, suggests that integrating EE contents and issues into primary school subjects require connecting contents and issues. Where such conditions are not fulfilled the role of environmental components is restricted to learning aid as in mathematics. It is suggested that teachers of mathematics at primary level should (Fox and Surtees, 2010) “create opportunities for drawing mathematical experience out of a wide range of childrens activities”. The implication may entail that through involving pupils in doing, observing and sharing mathematical learning can be connected to environmental matters.

The teachers interviewed plainly revealed that EE contents and issues are sufficiently covered in primary school subjects such as environmental science, social study, and biology. It was found that both teachers from natural science and social science areas, in similar way, single out subjects in which environment related contents and issues are sufficiently integrated. These are evident from the next expression:

Qabiyyeen naannoo bifa adda addaan gosa bar noota sadarka lff a keessa jira; Saayinsii naannoo keessatti baayyinaan yammu jiratu herrega kessatti ni xinnata. The environmental contents and issues are integrated at a varying magnitude in primary school subjects. They are numerous in environmental science but rare in mathematics (GeCiv15f-9).

Qabiyyeen naannoo gosa barnoota saayinsii gara gadii 1-6ti ballaa, gara oliitti garuu dhiphoodha. Qabiyyeen naannoo gosa barnoota hunda keessa jira ballinaa fi dhiphinaan adda addaa ta'a malee; Barnoota saayinsii keessatti qabiyyeen naannoo haala gaariin hammatamadha taarii akka herregaa keessatti ga'a mit. The environment related contents and issues are integrated in science 1-6 broadly and narrower upward, there are environment related contents in all primary subjects but with a varying size. EE components are adequate in science perhaps not sufficient in mathematics (MenBio9f-10).

The above evidence shows that, teachers from different schools and different subject areas reported the integration of EE components into all primary school subjects. Participants also ascertained that EE components are integrated into environmental science textbook sufficiently but are limited into mathematics textbook. Of these teachers, the one with biology background talked about the sufficiency of environmental contents in 1-6 grade level science textbooks contrasting to the thinner integration of EE components upwards. In similar vein the following interviewees strengthened the preceding assertion and brought in additional points related to contents of EE integration and practical learning experience application:

*Saayinsiin naannoo qabiyyee naannoo haala ga'aan of keessaa qaba; ballinni kutaa gadii irraa gara oliitti dabalaa; Yoo ilaalle barnootn biroo naannoo uummamaa qofa osoo hintaane hawaasummaa kan ilaalan jiru. Fakkeenyaaf barnoota hawaasaa. Ballinaa adda addaa ta'ulee barnoota hundaa keessa qabiyyeen naannoo jira. Environmental science comprises adequate environmental contents and issues, increases in scope with grade level. Others like social study do not emphasize natural environmental aspects only but also social issues too. All subjects incorporate some of such components at a varying magnitude (MenHis13f-12).*

*Qabiyyeen naannoo (biyyee, bishaan, bineenlada albuuda) ilaalu, kitaaba barataa baayyoolojii keessati hammatamadha. Haata'uu malee gadii fageenyaa hinqabu, gochaan shakaluu fi hubachuu irratti rakkoon yeroon walqabatu jira. Environment related contents like soil, water animals and mineral etc., are incorporated into primary school subjects like biology. However, it is not deeply treated, for practicing, exercising and understanding there is no sufficient time allocated (SekBio30m-17).*

The initial quote verifies the prevalence of EE contents and issues in all subjects with different scopes. The participant extendedly pointed out that environmental education components are well integrated into environmental science. It was also noted from interview evidence that social study incorporates both natural and social or cultural issues pertinent to environment. This participant cited natural elements such as soil, water, minerals and animals as contents of EE. Another interviewee (with science background) stated that EE components are integrated into biology textbook. However, the participant complained about absence of in-depth treatment of the contents and insufficiency of practical exercise and incongruence of contents to the time allotted.

The understanding that emerged from interview suggests that primary school teachers involved in the study exhibited positive views, with dissimilar magnitude, towards EE and its integration into primary school subjects. The EE components are limited in some and sufficient in other primary school subjects. Mathematics and English represent subjects incorporating limited environment related contents and issues, whereas environmental science, biology and social study subjects of

primary school are reported as integrating adequate EE components. Moreover, curriculum and pedagogic implications were noted where it is stated that contents descriptions appeared shallow, and opportunity for practical experience is less. Furthermore, it is understandable from the implication that subject-contents are focused more than learning process and learners' interest and experience; hence, safe to contend that education about environment is emphasized over education in and for the environment.

Even though the approach to the integration of EE was implied in their utterance during interview, it was noted that teachers are not well informed about curriculum development process, and even the idea of EE is not explicitly specified in the curricular materials accessible to teachers: notably teacher's guide and student textbook. Critical examination of the evidence from the sources (curriculum document and interview) appears consistent pertaining to the approach of EE structuring. Integrating EE into all subjects is supported by teachers but led to concern for the shallowness of the message and the minimal practical learning experience designed in some subjects. The theoretical and empirical evidences reviewed were found to be both supportive and conflicting to the present finding. For example, those favoring infusing of EE into all subjects stressed that treating EE with single subject status may lead it to be optional (not to be learnt as intended) and will be left for chance either to be chosen or not. It follows that EE is accepted to be incorporated into all school subjects by the majority (Conde and Sanchez, 2010:490; Disnger, 1990). Differently, a study carried out in Tanzania on primary teachers' views and experience (Lydia, 2011) found out that primary school teachers disregarding the integration of EE into all school subjects suggested that EE should be independently structured into primary school curriculum. The reason for the suggestion according to the participant is what and how to teach as EE components is not clearly specified.

### **5.1.3. Teachers' perception about their Competency in Teaching Environmental Education Components in Primary School Subjects**

In order to understand the practice of integration of EE components into primary schools teaching-learning process, obtaining teachers' comments and stand about their endeavor and competency in teaching environmental contents and issues in their subjects is important. Accordingly, the data obtained through interview showed, related to the existence of conscious effort among teachers, that while some exhibited hesitation about conscious effort of primary teachers to teach environmental

contents in their subjects, others seemed not sure. Some of the participants questioning the prevalence of conscious effort argued as follows:

I do have doubt about the existence of conscious effort to integrate EE content into their teaching; qabiyyee naannoo irratti leenjiin gargaaru hinjiru. Meaning there is no orientation or training on EE contents to support teachers (Sekche9m-19).

The interviewee attempted to justify his doubt on the prevalence of conscious effort on the side of teachers related to integration of EE in their teaching, partly attributed to absence of training on EE contents and issues. Unlike a few, most of the participants anticipated limitation in teachers' competence regarding teaching environmental contents in other subjects. However, they seemed to rely on pre-service teachers' training.

The participating teachers' idea revealed the existence of competent and incompetent individual teachers regarding integrating and teaching EE in the primary school subjects. The following extracts explain this point:

Hubannoo warrii qabanuu jiru kan immoo qabiyyee kitaabaa qofatti kan xiyyeefatanus jiru. Barsiisan gosa barnoota eebifameen osoo barsiise gaariidha. Meaning, while some teachers are competent others are not, such group only restricted to textbook contents. It will be better if teachers are assigned to subject they are trained in (GeSoS13f-8).

As can be noted from the above evidence, Participants claimed that some primary teachers teach environmental contents in their subjects competently, while others are less competent in teaching environmental components in their subjects (GeSoS13f-8), this last group are perceives as confining their teaching mainly to textbook contents and issues (MenGeo21f-13). In this connection the teachers' interview evidence also showed reasons unsatisfactory effort of integrating EE components at instructional levels. For instance, they (SekNsc14m-21; MenGeo21f-13) stated that: *bariisan ..., cimiinaan dhimma naannoo irraatti sochii taasisuun ni haffaa. Sirna barnoota fi kitaaba barataa ilaalichise, barsiisotaati wantii himaame hinjiru caalisaa ni kitaaba eergu alaa.* The preceding description explains that teachers' contribution to the environmental contents and issues integration into primary school subjects appears unsatisfactory. Moreover, teachers are not supported and oriented enough on curricular issues and textbook at a required level.

The implication of the result is that primary school teachers tend to depend mainly on textbook contents in their teaching which inevitably restricts the options of making learning environmental or using environment as laboratory for making learning meaningful. In addition to the teachers' views (lack of intentional effort and limitation of competencies) of integrating environmental components at teaching level, the state minister teacher education expert showed nearly similar view point. He claimed that in the case of "main streaming environmental components into teacher education curriculum so far the incorporation has been very limited, በተወሰነ መልኩ ነካ ናክ ተደርጓል፡፡".

However, “very recently, or starting from 2012/13 or 2005/6 EC, there has been effort of introducing environmental component aspect as an independent course known as cross-cutting course with 3 credit hours targeting principals and teacher of the primary school(MET05, M)”. Consequently experienced teachers concern about limitations pertaining to integrating EE components in their subjects is confirmable.

Thus, this finding verifies the mismatch of teachers experience with the holistic EE integrating model-Education in, about and for the environment into primary school curricula. The evidence also depicted that teacher were not equally competent and they often are restricted to contents covered in the textbook. Likewise, the contention made about the sufficiency of pre-service training does not seem sound. This is because though teacher preparation in pre-service phase is an important foundation, ongoing professional growth and enabling circumstances in the form of technical support, capacitating and informing, etc. is also equally important, but these appear unfocused areas as sensed from the interview communication. Hence, the concerns exhibited by teachers, beyond reminding us about the need for curriculum, and training alignments and an interrupted exchange of information between the experts and the practitioners, suggests the need for continuous professional growth so that they can effectively handle interdisciplinary learning areas like EE. Partly comparable result has been document in Asian-Pacific countries by Abe (2002), who reported absence of trained and competent teachers to teach integrated and composite subjects like environmental studies.

Therefore, I could argue that primary school teachers’ awareness about environmental education components and actual effort of teaching these components in their respective subjects appear problematic. This is because EE is interdisciplinary in character that requires formal and informal way of learning via education about, in and for the natural environment. However, teachers are found to be limited to textbook prescriptions. Yet, unlike education about the environment, education in the environment (as resource and informal learning stage) and for the environment (concern, respect, care and protection) appear less considered but essential in the eyes of the 21<sup>st</sup> century environmental concerns and challenges ahead of us. Even though most of the participating teachers claimed that primary school teachers are competent by training (which may refer to discipline based proficiency), EE is an approach in and education *about* environment perspective irrespective of *in* and *for* the environment view, hence may not contribute to

environmental literacy as desired. The observation of Morris (2008) reminds us, however, that the decisiveness of the role of teachers in this regard. He concluded that even though curriculum can be specified and controlled by a firm accountability, it is teachers who decisively shape the educational experience of children and young people at schools. This result tends to share concerns investigated by Spiropoulou et al. (2007), who after reviewing different studies, concluded the following. “For them, the large proportion of teachers (e.g. Greece) hesitated to engage in environmental programs perhaps due to limited environmental knowledge and literacy they obtain from their pre-service and in-service trainings” (p.448).

#### **5.1.4. Teaching Environmentally Integrated Subjects and Indigenizing Environmental Learning**

Teachers play an indispensable role both in curriculum making (at least through their lesson planning) and translating it to educative actions in learning processes. In this context, I tried to investigate how teachers integrate EE components and indigenize environmental learning from primary schoolteachers’ perspectives. The interview evidence revealed that teachers are of different opinions as understood from their reaction to the question posed. Some focused on curriculum aspect and indicated that indigenous experience is rarely covered in limited subjects of the primary school, while others emphasized learning strategies (pedagogic) and claimed that it is not only local environmental experience that appeared meager but practical and outdoor experiences are also scarcely considered. Thus, the teachers’ interview evidence pertinent to teaching environmentally integrated subjects and indigenizing environmental learning took two shapes. These refer to less incorporated indigenous experience in environmentally integrated subjects and rare use of practical or outdoor learning strategies.

In this regard, participants showed explicit concern about integration of indigenous (local) environmental experience in their respective subjects and teaching. Most of the interviewee argued that even though there are rich indigenous environmental knowledge components in the community, they are less considered or neglected in the school curriculum, textbooks in this case.

The following excerpts consolidate this point:

Qabiyyeen muuxannoo jireenya kitaaba keessa jira ni xiqqata malee. Kanaa wajjin muuxannoo naannoo dabaluun ballisuun gama mana barumasa fi barsiisota ni hafa. The real life or local experience is included into the textbook but it is meager, along this the effort of relating to the local experience at school level by teachers is insignificant (Dedph15f-3).

Barnoonni si'anaa naannoon kan walqabate ta'e, “ያካባቢ ይዘትና(environmental content) ልምድ ይበልጥ ቢካተት. (Barsiison kan muxxannoo qabanuu isaani hin qabinne caalaa fayyadoodha). Currently most of the subjects incorporate environmental contents but it is recommendable to consider environment related experience from locality. The experienced teachers appear better in linking lesson to local experience(GeBio34m-7).

As expressed above, participants (of different subjects) from different schools reported the prevalence of limited practices of connecting lessons to real life experience of learners. Yet, this group remarked that there are no considerable local or ingenious experiences in primary school textbooks. Regarding teachers' teaching practice, the participants stated that linking students' learning to the indigenous experience and community real life is not as effective as expected at school level by teachers. The words of the interviewees which reads “muxeannoo naannoo dabaluun ballisuun gama mana barumasa fi barsiisota ni hafa”; “ያካባቢ ይዘትና ልምድ ይበልጥ ቢካተት”, (Afan Oromo and Amharic version respectively) suggest the desirability of adding and enriching environmental learning by local or indigenous experience which is neglected at school level. The remaining participants also demonstrated further concern about the absence of local or indigenous environmental experience at instructional level. In this sense, the evidence from the oral communication revealed that the abundant indigenous environmental experience that a community possesses are never studied and integrated into school subjects as desired.

Other three participants supporting the preceding view (first and second) claimed: “fakkeenya naannooti fayyamuun jiratulee hubannoon muxxannoo naannoo...hinjiru” (GeSoS13f-8). This implies that using environmental examples are prevalent but there is no awareness about indigenous or local experience; and “beekumsii guddaan hawaasa keessa jira, garuu barnootaa keessa haala barbaadamun osoo hingaliin hafe” (Menphy29m-14)- there are rich environmental knowledge possessed by community but it is not explored and incorporated into educational programs as expected. According to the last participant, linking learning to the local or indigenous environmental experience seems insignificant which is expressed in his words as “muxxannoo naannoon walsimsiisuun qubsaa mit” (Sekche9m-19). This indicates that integrating local environmental experience is not satisfactory. Accordingly, it could be concluded from the data that local experience pertinent to environment is marginalized partly reflecting the regard given to EE. Certain attributing factors like low awareness of teachers on environmental matters and shortage of resource as input to teaching-learning process were also cited. The implication reflects that the effort of maintain curriculum relevance and motivating learning interest is constrained by such impediments. In other words, the theoretical intentions in the form of policies, frameworks and the integration practices of EE contents and issues in the learning process are never aligned. This further suggests that education in and for the environment still remained neglected compared to education about the environment.

The evidence from interview on the state of teaching EE content in other subjects disclosed that primary school teachers mainly confine their teaching to textbook contents. It was also identified

that in addition to insufficient local experience infused and less regarded practical methods, classroom based teaching and group learning (routine 1-to-5 coordination) or learning theoretical knowledge from classroom appeared dominant. Consequently, the effort and opportunity for practical and real experience related learning appeared minimal.

The ideas of different participating teachers given below verify this fact:

Qabiyyee kitaaba barata keessatti dhiyyate barsiisuu irratti xiyyefana, barsiisan ajajaamaa waan ta'eef kana wajjin Afaan Oromoo amma wayiitti tokkoo keessaatti waan hedduu tuu raawwatama. Kanaafu muuxxannoo fi jireenya walqabsiisuun, gadii qabanii shaakalchiisun dangeefamadha

We focus on and teach textbook contents; in Afan Oromo context teachers follow the prescribed contents. As a result, connecting to local experience and real life as well as engaging activities are all restricted (SekNsc14m-21).

Barsiisonni hedduun qabiyyee kitaaba qofaa irraatti xiyyefatu; kun immoo, Sirritti dubbisuun naannoo irraatti hubannoo uumu. Muxxaannoo hawaasa naannoo fayyaduu osoo dabalame, leenjiin kitaaba dhiyaatu fi tooftalee barsiisuu irratti osoo jirate”. Many teachers are restricted to textbook content, while others read and enrich their awareness about environmental contents. Yet inclusion of local community experience, training on textbook and methods of teaching need to be considered (MenBio9f-10).

It is apparent from interview data that primary school teachers focus on textbook contents in their teaching. In this regard, the first interviewee above critically argued that “qabiyyee dhiyyaate...irratti xiyyefana, barsiisani ajajaamadha... muuxxannoo naannoon walqabsiisuun shaakalchiisun dangeefamadha”; meaning, “We are restricted to the specified contents; teachers are urged to follow the prescription and option for practical exercise is limited”. Supporting this idea, another participant also reflected the need for consideration of experience of the local community, orientation/ information on textbooks and teaching approaches. Teachers with social science knowledge similarly revealed meagerness of indigenous experience in their subjects and marginalization of engaging and project oriented teaching approaches. The next quotations vividly strengthen this notion:

Ok, there exists some issues of local experience in social study textbook like cultural experience; but practical and project oriented learning chance is lacking (SekHis13f-16)

Muuxannoon naannoo (hawaasaa) xinnoon jira. Fakkeenyaaf Geeraan kaanan dura bosoonaan uwwifamtu akka turteef garii caaluu mancaa'u issaaf yaada kunuunsa naannoon waliin ni kaafna. There are little of local (community) environmental experiences in primary school textbook. But we use examples from the environment, for instance, discussion on how the formerly dense cover of forest in Gera wereda has been degraded (GeCiv15f-9).

It is evident from the teachers' words above that local environmental experience and practical and field based methods of teaching were found to be insignificant in teaching-learning process of the primary school. Moreover, the understanding derived from the data suggests the predominance of classroom confined and textbook based teaching approach as compared to practical or skill based strategies. However, it is contended (Lake, 1994) that students are engaged in their learning when supported to make connections across discipline and with the world outside the classroom. Thus, obviously, environmental education is characterized by learning process or learning focused, but the evidence obtained revealed that local or indigenous environmental experience is not only overlooked at curriculum making stage but also at actual teaching-learning level. In this regard, the claims made by some participants about the existence of rare local environmental experience in certain subjects appear inconsistent with the preceding argument. The earlier argument stresses lack of awareness on EE matter among some primary school teachers, and inadequacy of supports on curricular material orientation as well as related teaching skills. The result of this study seems corroborating to the study conducted in Asian-Pacific regions (Abe, 2002) which investigated that the prevailing curriculum is book knowledge based and examination oriented. It also revealed that in many of the region's countries, curriculum components are not relevant to local conditions, nor are constructed around ecological concepts. Likewise, according to an inquiry carried out in the US (Bodzin, et al., 2010), it was found that schools particularly based on textbook learning generally do not support the use of outdoor spaces or locality for instruction.

In a similar way, in an African context, it was reported that although there was rich useful indigenous knowledge in African society, concurrently, there was a tendency of lowering and considering African indigenous knowledge as useless by colonizers (Warren, 1992; Otiende, Ezaza and Boisuert, 1997) as cited in Dessalegn (2014). Dessalegn and more others (Workineh, 2001; Dixon and Wood, 2001; Kitessa, 2007; Teshome, 2013) further assured the prevalence of rich indigenous environmental knowledge and values among the Oromo society where this study was carried out, but as the evidence of curriculum document and interview revealed, it is not well analyzed and integrated into the primary school curriculum.

Nevertheless, meaningful and relevant learning occurs in real context. Accordingly, Bodzin et al., (2010) writes that students develop knowledge and skills in the context by using the resources of the local community. It is also advocated (Bruner, 1960 cited in Sadker and Sadkar, 2003) that

discovery method needs be applied where teachers help students in uncovering meaning by their own. Thus, education in, about and for the environment in its holistic integrated sense does not seem considerably applied.

#### **5.1.5. Integration of EE into primary school subject and Status of Textbooks**

It is evident that teachers' attitude towards the integration of EE into primary school subjects and their perception regarding the status of students textbook has implication on teachers understanding and actual teaching of this component in their subjects. Accordingly teachers were asked how they view integration of EE into primary school subjects. It was found that all of the participating teachers favoured the integration of EE contents and issues into all school subjects yet verifying differently. The supporting claims investigated include these: *"hammatamuun qabiyyee naannoo barbaachiisaadha; ..., hammatamuun issa gaariidha. Barnootni kamiyyuu naannoon alaa mit"*. The interpretation may mean integrating environmental contents and issues into school subject is desirable and necessary (DedNsc12f-2; GeSoS13f-8). Participants further reasoned out that integrating environmental components is significant because it makes leaning clear and understandable, in that starting lesson from what is known and simple, foster learners' interest, enhance participation and meaningful learning. Integrating examples and experiences from the environment concretize concept learning. Students understand what they observe and hear and practice, it is also crucial sources for producing things needed for living, and any subject cannot ignore environment.

Importantly, teacher participants justifications for their acceptance of EE integration into their subjects tended to vary. For example one the reason related contribution of environmental components to students' learning both as contents and learning aids. Accordingly, it was claimed (DedNsc12f-2) that environmental contents and issues can foster concretization and understanding of pupils learning (e.g. moving from what is known and using local examples stimulate interest and support learning). The interview evidence implies that if environmental education contents and issues along with local experience are mainstreamed into the school subjects to the desired level, the contents become relevant and meaningful, and learning would be interesting and engaging for what is known is the basis for further learning. Participants also showed positive attitude towards the integration of environmental contents into school subjects arguing that it provides observable and practiceable options, serving as source of basic necessities and foundation for future learning (GeSoS13f-8; SekAO17f-18). Hence, any subject cannot be out of environmental deal. Perhaps,

the last ideas may go with David Orr's (2004) view in which he argues that every education is environmental though it appears contested. I suppose that this may urge one to ask (though teachers are claiming this) what is the state of their actual teaching practice.

Textbook is the basic sources of curriculum messages in general and that of environmental education in particular that need be communicated to pupils. In this regard, teachers' perception and practical experience related to textbook is expected to have implications on their teaching and integration of environmental components. Teachers were asked about the quality and state of primary school textbooks. Accordingly, primary school textbooks were perceived to have strengths and limitations. The following statements from the participating teachers represent the two particulars:

Kitaabni barattoota gaariidha; baayinaan gochaalee fi shaakala hammatame barattoota ni hojjechiisa." -The student textbook is good, for the activities and exercises designed are hoped to engage learner (GeCiv15f-9).

Qabiyyeen naannoo akka baayyolojiiti qinda'ee, yaadanoo gochaalee fi wayiitiin ramadame walgitaa mit. Qabiyyeen waldura dubiin eegama fi walsimaa hinfakkatu. -In biology textbook, the environment related contents, descriptions, and activities structured and time allocated are not matching. Contents do not seem well sequenced and integrated (SekBio30m-17).

It is apparent that some of the participants (e.g. GeCiv15f-9) reported the strength of the current primary school textbooks claiming that textbook preparation, relating to environment, and structuring of exercises, activities, and illustration are good and support student learning. It is clear from the conversation that teachers tended to judge the textbook from inclusion of learning experience and partly from visual medium incorporation. It is noted that learning activity/experience and exercise desirability were sensibly recognized though its sufficiency and practicality is still questionable in the eye of the holistic and interdisciplinary characteristic of EE.

Differently, other participants talked about the weaknesses of the primary school textbooks. This group (e.g. SekBio30m-17; SekBio30m-17) outlined that the contents and activities covered in the textbook and the time allotted mismatch, poorly sequenced organization of contents and mismatch between textbook and the teacher's guide. The participants also remarked that particularly in science subjects such as biology, in addition to lack of clarity of some contents, lack of resources like laboratory dictated teaching-learning approach to be telling and question-answering dominated. Still, other interviewees (DedAO27f-1; SekHis13f-16) further complained about the

weakness of primary school textbook and revealed that the time assigned does not match contents and activities designed and that there is mismatch of some subjects' content difficulty to students' maturity level. The difference between teachers' view on the state of textbook could be attributable to the variation of commitment and skill involved during textbook writing and perhaps teachers' perspective differences.

It was found out that owing to crowdedness of some textbooks of the primary school with topics and activities (some described it as unnecessarily repetitive), insufficiency of time to address these components, involving learners cooperatively or individually have been constrained where large class size is identified as additional impediment. Given these drawbacks, it was also ascertained that teachers are heavily dependent on textbook contents and activities for teaching purposes. A similar result has been reported by Abe (2002) that found heavy reliance of teachers on textbook, and showed that sometimes those textbooks are not relevant to the local situations. Thus, though EE integration into primary school subjects is accepted by most of the primary school teachers, its integration process at curriculum and learning level appears constrained by numerous factors like limitation in quality of textbook and lack of resource input.

### **5.1.6. Opportunities and Challenges relate to Learning EE Components at Primary School**

#### **a. Opportunity of learning EE**

Often, it is communicated that the opportunity to learn may depend on quality of resources, school conditions, curriculum and teaching that students experience. However, in this section, the opportunity for learning environmental contents and issues and the challenges encountering as perceived and practiced by teachers are examined. The participating teachers exhibited different opinions regarding the opportunity students have for environmental learning. Some participants claimed availability of enough opportunities while others talked about limited opportunities to learn EE components.

Those who claimed the existence of enough opportunity stated the following:

Amma, carraan qabiyyee naannoo barachuu ballaadha. Fakkeenyaaf Saayinsii naannoo fi A/Oromoo naannoo irratti hunda'a. Qabiyyee kitaaba biratti gummiwwanii adda addaa kan akka kunuunsa naannoo, shamaranii, Afaani, amalaa gaarii ...carraa dabalataati. Currently there are wide options to learn about environment. For example environmental science and Afan Oromo subjects are environment related. This is supplemented by different clubs such as environmental conservation, language, and gender, ethical clubs (GeSoS13f-8).

Carraan barattootni qabiyyee naannoo barachuuf qabanuu ga'aadha. Barnoota kutaa wajjin, gochaan-shakaluu, abaaboo dhabuu, manatti yaalani gabasuun ni baratuu. The opportunity students have to learn environmental contents is sufficient. The classroom activities, practical exercise-planting flowers, experimenting at home and reporting are integrated (MenHis13f-12).

Interview data evidently showed that the opportunity to learn environmental contents and issues as sufficient. This is verifiable from the interview data cited above that states, “*carraan qabiyyee naannoo barachuu ballaadha*; meaning, opportunity to learn environmental contents is ample”; “Carraan barattootni qabiyyee naannoo barachuuf qabanuu ga'aadha- opportunity students have to learn environmental contents is sufficient”. The justification posed by participants included environmental contents and learning experience such as experimenting and reporting in subjects like environmental science and supplementary activities of the extracurricular mode (clubs).

The understanding emerging from the evidence suggests that most of the participants appeared to consider the textbook based classroom learning as chance to the wide option of environmental learning. However, classroom based learning in most cases inhibits learning real environmental experience and may not be meaningful learning for it appears theory or knowledge focused. On the other hand, the claim of club and practical activity as options could be related experience (skill) in terms of environmental learning thus desirable if focused. The practical observation of the investigator showed deviation from what the participants talked about club, though numerous clubs are established at school every academic year, they remain inactive in most cases because they are additional load to the already overloaded primary school teachers. Consequently, they remain peripheral as some complained (e.g. Menphy 29m-14).

According to some teachers, mostly, there is no explicit time reserved for extracurricular activities which is further shadowed by numerous school subjects to be taught and learned per week. In this part, the result implies that education about the environment (knowledge) appears dominating education in environment (action-skill) and education for the environment (concern, care, protection). However, given environmental problems facing humans, moving from awareness to action through holistic environmental learning model seems a matter of urgency now than ever.

Differently, as mentioned earlier, other interviewees argued that the option of learning environmental education components is narrow. The following statements from the participants verify this position:

Carraan qabiyyee naannoo barachuu dhiphoodha barnoota biroo akka Afani, yammu saayinsii naannoo waliin ilaalamuu. Kana wajjin, sababa gababina yeroo qabiyyee fi gachaalee karoofameen qabamu hojii dareen alaa dabaluun rakkisadha. Relatively, in subjects like Afan Oromo the opportunity to learn environmental education content is narrower compare to environmental science. On the other hand due to time constraint going out of the planned contents and learning experience or classroom activities is impractical (SekNsc14m).

Ija Afaaniin carraa jiru dhiphoo fakkataa, innis mata duree murasaa kitaaba irraaf hojii daree irraa qofaadha, kara bira gummiwwan akka kunuunsaa naannoo fi qonnaa fa jiru.” In Afan Oromo context the opportunity available seems narrow; it is restricted to a few content from textbook and classroom experience. On the other hand, involvement in clubs like environmental conservation and agriculture may help learning about the environment (DedAO11m-5).

This group who uttered about availability of less opportunity to learn environmental contents and issues related their contention to textbook or subject contents and prescriptions. The participants who disclosed the narrow opportunity students have to learn EE components attributed the problem to reasons like restriction to textbook contents and classroom activities, insufficiency of the time allowed to go beyond the designed contents and prescribed activities. The second participant, inconsistent to his prior argument, cited clubs such as environmental conservation and agriculture as additional options for learning environmental education components.

Finally, it was noted that both the participants who claimed the availability of ample opportunities and those contending of limited chance were found to raise nearly similar points for maintaining their positions. They mentioned textbook contents and classroom based activities simultaneously as good opportunity and as limiting factor, respectively. Consequently, I could argue then that the position of those who contended the prevalence of limited opportunity seems reasonable in the context of the present study because subject-content focused and classroom based mode seem inconsistent with the EE character and intents. Moreover, a few instances of activity based learning instances exposing pupils to environment do not seem enough to induce meaningful environmental understanding, values and skills. By a similar token, the co-curricular activities in the form of clubs suggested as supplementary opportunities at school levels seem anecdotal for passively operating in most cases. Irrespective of fixed contents of textbook and classroom based learning identified in this study, teachers' effort is thought as agency for opportunity of students' learning. In this connection, McNeil (1995) states that teachers through their lesson planning initiate a curriculum that is responsive to a local situation, individual student and teachers own passion. In similar discourse, Morris (2008) seems attributing more roles to teachers regarding

learning opportunity. For him in spite of curriculum specification and firm accountability control it is teachers who decisively shape the educational experience of children and young people at schools.

### **b. Constraints against the EE Learning at Primary School**

It was found that there have been numerous constraints impeding the process and effort of integrating EE into primary school curricula thereby limited the opportunity of learning EE essential components. These constraints are partly attributable to curriculum, teachers, structural agents (e.g. curriculum experts and supervisors) and learners. Accordingly, of the evidence obtained the following highlighted students, teachers, and subject related challenges as impediments to environmental learning. Some of the participants (e.g. SekEng30m-22 and SekBio30m-17) disclosed low interest and effort of students as limiting factors. Their claims stress “carraan qbiyyee naannoo barachuu ballaan ... daree fi gummiwwani jiratanu ilee fedhiin barattoota lafaadha”. The meaning entails that students’ exhibit low interest in learning, despite the prevalence of sufficient options to learn EE contents. Differently, others elucidated teachers and subjects-related limitations. Evidences illuminating this viewpoint are given below:

Akka kooti marii wliinitiin (one to five) haallaa barsiisuu fooyessuf sochiin jira ga'aa hinta'in malee. Barannooni daree (mana barumsaa) alaa haalan hinjiru. I think the small group (one-five) learning arrangement being operating somehow contributes to the improvement of students learning but seem less effective. There is no much out of classroom or school learning chances (Dedph15f-3).

Fedhiin qabiyyee naannoo hammachiisu yoo jiraate iyyu hojjiirraa oolchuu irratti rakkoon jira. Barnootni yaad-hiddamaa irraatti xiyyeefata. Kun harka caabaan mana kabuu yaaluu fakkata. Gargaarsii xiqqaachuunis rakkoo fida. Though there is a need to incorporate EE components, implementation is problematic, the subjects often focus on theory, hence it is like trying to mend items with broken hands moreover lack of support from line bodies is impediment (Menphy29m-14).

According to interview evidence, the currently applied teaching approaches (Dedph15f-3) including small group learning (one-to-five) arrangement are criticized for ineffectiveness and propounded by absence of out-of-classroom or school learning opportunity. It is also (Menphy29m-14) claimed that although integrating environmental contents into each school subject is favored; its implementation is problematic. Besides, the theory emphasized orientation of most of the school subjects, and lack of supports from relevant bodies is perceived as exacerbating the problem of integrating EE into primary school subjects and students’ learning

opportunity of this components. Thus, the perceived constraints suggest the unsuitability of the conditions under which schools are endeavoring to integrate EE into primary school curricula. The last participant above used-“harka caaban mana kabuu” that may imply the notion of problematic practices of integrating EE into other primary school subjects. The message literally may mean “attempting to repair a house with broken hand”.

The expression suggests that although effort is made, it is not complete and something of important input (e.g. support and incentives) are lacking. Consequently, the holistic EE integration into primary school subjects is constrained. Similar observations have been documented by different investigators at diverse settings. Among various barriers influencing the integration of EE both at curriculum and teaching-learning level are lack of knowledge in EE (Abe, 2002), shortage of lesson time, lack of teaching and learning materials and the issue of the safety for field experience (Chi-chung Ko and Chi-kin Lee, 2003). It is also found that the predominating traditional schooling, say for example focus on testing, standards, inflexible approach, etc. (Spirpoulou, et al 2007) appear contradictory to the holistic nature of environmental education, which is supplemented by the less commitment, limited capacity of teachers to teach EE components ( Daniel, 2007).

## **5.2. Practice of Integrating EE components in the Classroom**

### **Teaching-Learning Process**

In order to confirm the data from curricular document analysis and interview data, classroom lessons were observed. Five lessons observed are presented as samples in this section. The lessons observed included Afaan Oromoo of grade 1, environmental science of grade 2, mathematics of grade 3, and 6, and social study of grade 6.

#### **Lesson One: Afaan Oromo Class**

The lesson observation conducted on the basis of teacher’s permission, took 40 minutes and culminated by brief post-observation discussions. For this purpose, I adopted a simple form having three phases (Appendex, 1B, p.233) that I referred to as inclusion/introduction, core or main lesson activities and conclusion stages of lesson. It was assumed to guide the lesson observation and understanding of how the teaching-learning process was handled and integration of environmental contents and issues was practiced during the lesson.

It was found that at the first stage, the teacher started the lesson through revision of the previous lesson and introduced “W”-(pronounced in Afan Oromo as *wa* ) by writing it on chalkboard. In the next stage, the teacher showed the alphabet “w”, explained its shape and sound; students were encouraged to identify the letter “w”, repeat after the teacher its sound and copy it into their notebook. The teacher also tried to create words that involve “w” involving students. The lesson continued to teacher’s passage reading entitled “Hawwii fi Guyyoo”. The message of the passage mentioned: *“Hawwii fi Guyyoon ganamaa fi galgalaa waliin taphaatu. Hati Hawwii waliin taphaachuu isaani ni jaalatti”*. The passage conveys that Hawi and Guyo play together every morning and evening. Hawi’s mother likes their plays. Students were listening, identifying the message and answering questions drawn from the passage. Lastly, the teacher revised the alphabet and the passage content and concluded the lesson.

### **Reflection**

The teaching approach employed was somehow logically progressed. However, the effort of linking with prior learning and environment as resource and stage of learning appear less effective and shallow. There was no visual materials used from the environment; for instance, to represent alphabets. Moreover, connecting the lesson with the next topic was overlooked. It was found that teaching was confined to textbook contents. The methods used were more of telling and showing dominated coupled with students question and answer followed by copying experience. Consequently, perhaps, we could argue that consideration of environmental education components was not materialized at instructional level as desired, unlike education about the environment, notably social environment implied in the passage. No effort of connecting learning to the real environment was seen. The teacher could have connected students learning of one day activity (Fogerty, 1991) to the other days’ and one idea to other issue in their environment so that they can construct their meaning. Dewey in Petro et al. (2015) boldly advises teachers on this matter and stresses engaging (e.g. practicing the shape of alphabets from physical objects), expanding experiences, using multiple methods of learning that offer exploration, thinking and reflection(e.g. environmental message) opportunities through interaction with environment.

## **Lesson Two: Environmental Science Class**

Similar procedures were seen during other lesson observations. Accordingly, environmental science class of grade two was observed. The topic of one lesson was “Meeshaalee Bu’aa Teekinooloojii”, or “Technological Equipment”. Initially, the teacher gave summary on radio (raadiyoo) and extended explanation with other types of tools. She outlined teelevizyiinii [Television] eelee humna ibsaa [bakery], firijii [Refrigator], kaawuyaa ...and the like, describing the items using some illustrations from the textbook. For example, the teacher instructed pupils to see figures (from pp.101-103), elaborated the functions and uses of these materials. This was followed by question and answer and students treated as a whole but a few students attempted answering questions individually. Students mostly listened to teacher explanations, copied and attempted questions from the textbook.

### **Reflection:**

As noted from the lesson observation, the teacher took more time of the instruction than the students. The lesson was characterized by passivity and abstract concepts which lacked connectivity to the real environment and learning resources. The evidence from lesson observation suggests that the topic was not related to children’s environment where, for example, the technological outputs are unthinkable outside the natural environment but atleast never be reflected. The emphasis given to the uses of technological tools serving domestic functions implies the human-centric or techno-centric views reflected in the subject. This in turn may reflect the minimal regard about and care for environment and its resources. What Fogerty (1991) called immersed integration can be applied by teacher’s facilitation and students’ independent effort. Students can be guided to learn through problem solving or project method and make connections between the classroom theory and real world experience based on their interest and self directed learning. In the same vein, for attainment of improved living standard, technological outcomes are undeniably important, but it should take into account the pressing impact of human activity including the technological utensils mentioned on the natural environment. Yet, it seems that teachers of this level are not familiar with such interconnections.

### **Lesson Three: Mathematics Class**

A female teacher conducted a lesson in mathematics class, grade three. At the inclusion level of the lesson, the teacher attempted to review the prior lesson and introduced new topic entitled “*yeroo safaruu: measuring time*”.

The teacher extended the lesson by sketching pictures of watch on the board. She explained how to identify and tell time using pictures and illustrations from the textbook. The students were given class-work that involved identifying time from the pictures. The lesson was based on textbook contents (e.g. pp. 130-132) and provided exercises of time measuring. The lesson was ended with an exercise given from the textbook. From brief post observation discussion with the observed teacher, I noted that the teacher had hesitation about the practicality of integrating environmental contents into mathematics teaching due to the subject matter’s nature. Moreover, she indicated that mathematics teachers lack orientation on the treatment of environment related contents in their subjects.

### **Reflection:**

Of the three stages of lesson I consider, the teacher started well at introductory (inclusion) phase but that good beginning never continued into the core activities and conclusion stages of the lesson. I witnessed that teacher was more active and used more time as she explained, demonstrated, wrote and drew pictures, and asked questions. Moreover the textbook contents, descriptions, exercises and illustration were much emphasized by the teacher, while relating to real life and immediate environment was not exhibited. Students’ learning could have been linked to nature or environment at least through the use of learning resources from the environment but never applied.

Students were observed involving in listening, copying, answering question about time. Another observation is the lesson lacked conclusiveness and the pupils were not introduced/engaged in their future learning. The implication of lesson observation shows that subject teachers tend to neglect environmental issues in their teaching. This was evidently manifested from teacher’s explanation that says mathematical concepts do not match with environmental components, and teacher’s restriction to textbook contents as well as the teaching dominated approaches employed.

Therefore, EE components even education about the environment let education in and for the environment had not been considered in teacher's actual teaching. In this regard it worth noting that EE are expected to be integrated and taught into all school subjects as one of the overarching issues but ill considered at teaching level. Consequently, I could argue that this is partly a felt setback to the development of proper environmental understanding, concern, care, and responsible behavior regarding humans- natural environment relationship.

#### **Lesson Four: Mathematics Class**

Teacher introduced the topic of the lesson-“Measuring Areas”. She clarified the content-“Bal’ina Danaa”; and continued presentation by drawing geometrical diagram having different shapes like circles, squares and triangles. Then, she demonstrated how to calculate and measure area and solved some equations on the chalk board.

Then, students were invited to calculate related equations on the chalk board, and 3-4 students attempted the task. Students were also given classroom work from the textbook, and students engaged in calculation while the teachers was observing around and checking. The lesson period ended up before students finish the task.

#### **Reflection:**

The understanding emerged from the lesson observation reveals that the mathematics lessons were well structured and strictly followed textbook contents. The teacher also demonstrated effort to assist student learning on content set and involved them in activities but no connection to the environmental matter. In this regard, as notd from postobservation discussion, even though primary school teachers favor the integration of environmental contents and issues into their subjects, practically, they did not integrate it in their teaching. In this regard, the teacher claimed that environment related issues are rare in mathematics because it is not suitable for environmental contents. To the point how learners are supported, she stated that learning aids will be prepared from local resources and used in teaching. However, no learning aid was used during classroom observation. The teacher also complained about problems related to the textbook and teachers guide. The teacher stressed that some contents of the textbook appear difficult, lack clarity, and at

times, teacher's guide and student's textbook mismatch. For instance, as the teacher said, without specifying procedures or explanation, answers to questions are given in the guide.

The lesson data confirmed that textbook contents were more focused; while environmental issues are negligible in the textbook. What was witnessed at the instructional level seems affirmable with interview and curricular data. Some teachers asserted that there is no deliberate or intentional effort to integrate environmental issues at teaching-learning level. However, regarding the question of connecting or integrated contents and issues of different learning areas/subjects/ different educators forward diverse suggestions. For instance, Fox and Surtess (2010) state that, a child learns meaningfully through a sequence of abstraction. They suggested four elements represented by letters 'ELPS' as a frame of sequencing. Where E= Experience with physical objects. L= Spoken language that describes the experience. P= Pictures that represent the experience. S= Symbols that generalize the experience. Hence, mathematical conceptual experience can be connected to environmental issues using such a strategy. In a similar way, it is claimed by (Fogerty, 1991) that topics and contents can be sequenced in a subject like mathematics to provide a framework for related and/or intended concepts. For example, a graphing unit can coincide with data in a weather unit. Consequently, as Wragg (1997) remind us (that the detailed routines of curricular decisions are left for teachers even when their syllabus and textbooks are externally determined) teachers are expected to connect contents and issues, or even alter the sequences of topics and contents of their subject textbooks for intended meaningful learning.

### **Lesson Five: Social Study Class**

This lesson was also observed focusing on the previous phases, inclusion, and main activity and conclusion stages. The teacher started by revising points about problems related to health like HIVAIDS. Students were listening, and identifying ideas.

The lesson continued mostly in the form of summary focusing on population size, population growth (baayina, heddummina uumataa) and conditions contributing to population growth. The teacher opened discussion via questionings, and students were involved in the discussion, which was dominated by some students. Students exhibited the disparity prevailing among developing and developed societies regarding population number and population growth. A question posed regarding the reason for rapid population growth in developing countries and students reacted

explicating the lack of education and the low attitudes communities have to children's education. Meanwhile, the teacher added comments on how population growth is regulated in the developed countries on the basis of their educational and development level. He further contrasted this to developing countries and cited sub-Saharan countries as instances where educational attainment is lower and community see children as assets. The lesson was ended without concluding the point under discussion due to shortage of time.

What were expected but never occurred during the lesson's observation include discussion of the impact of large population size on the environment and responses required from humans including students as well as use of learning resource from the environment. In the postobservation discussion, the teacher clarified that the impact of large population size would be addressed in another lesson.

### **Reflection**

The impressions that emerged from the lesson observation revealed that the teacher seems well informed and experienced in teaching the subject matter contents. He also emphasized population size and growth which are also environmental issues. The classroom situation exhibited a sign of engaging through discussion and questioning. It is apparent from the observation that contents of environmental education have been treated in teaching effort, however, it was information dominated. Students were not helped to learn from local environment examples or experiences and develop a caring sense for that environment. Moreover, absence of learning resource could reflect lack of significance regard given to the local instances and experience that would be part of environment.

### **5.3. Chapter Summary**

In summary and consistent with the perceptions of curriculum experts and most of the teachers involved in the interview, the lesson observation results suggested little consideration of EE components in the teaching practice of teachers observed. This could be explained by the fact that teachers strictly followed textbook contents (as a result, almost all of the) teachers observed confined their classroom instruction to textbook information, prescriptions and questions. At the same time, the teaching approach applied in most cases were traditional information exchanging type (e.g. mostly involved telling or sharing via discussion) with little participatory methods of

teaching as it was noted in mathematics and social study classes. On top of these, teachers do not seem well informed about EE in its integrated holistic form as components of primary school subjects. In this regard, most of the teachers observed did not try to reflect the intent of environmental learning. For instance, they did not use local examples, relate learning to real experience, resources or connect the lessons to the environmental matters. Thus, the lesson observation data did not reveal the effective application of education in, about and for the environment in a balanced way. Teachers were found teaching more in education about the environment way with less of education in and for the environment.

Then, the findings of the study indicated that although all the participants demonstrated positive attitude towards EE and its integration into primary school subjects (curricula) and environmental topics and contents are sufficiently incorporated into some primary school subjects (e.g. ES, IS, SS, Bi) teachers actual teaching does not seem effectively integrating environmental components in their respective subjects. In other words what they claimed tended to deviate from what they had practiced in their classrooms. As identified from the observed lessons, most of the lessons depended highly on textbook contents, involved methods such as explanations, discussion, and question-answer and classroom activities. Thus, EE components are taught in education about environment way as compared to education in and for the environment perspectives. The observation also suggests teachers mainly focus on their subject matter content as listed and scheduled in the curricular materials notably textbook. This was also coupled with absence of learning resources and experiences from the environment. Thus, traditional teaching approach that emphasizes teaching tends to dominate. The study results are also supportive to the present study reported by Abe (2002) which revealed that mostly chalk and talk method, absence of practical application, divorce of classroom teaching from real world outside being experienced in the Asian-Pacific counties.

Peter and Cheruto (2013) explored methods of teaching that involve lecture, guest speaker (direct) and question and answer, group discussions, problem solving, field trip and project method (indirect). They also described co-curricular activities (e.g. club meeting, religious society's meeting.) as supplementary strategy to teaching. Similarly Lee and Tilbury (1998) examined schools of China and disclosed that traditional teacher-centered and textbook based pedagogy as dominant feature of their system. They also showed that teachers in China tend to use classroom

time to focus on subject content and assignment thus more concerned about teaching than student learning. However, EE characterizes a learning process and requires connection to the environment. For example, Bodzin et al. (2010) state in the context of environmental literacy and care, deep understanding of the earth, its systems and their interrelationships is crucial, an understanding that is significantly enhanced by direct experience in the environment.

## **Chapter Six: Major Findings, Conclusion and Implications**

The purpose of this study was to investigate the integration of EE components into primary school curricula. In order to achieve this purpose, data were gathered through content analysis of syllabus and textbooks, interview with curriculum experts and teachers as well as observation of selected lessons. Textbooks were purposively selected and analyzed to examine the coverage of EE contents, issues and problems. Curriculum experts and a pre-service teacher's education expert were selected using purposive sampling to participate in the study from MoE (6 males) and Oromia Education Bureau (4 males). Similarly, primary school teachers (10 males and 12 females) were purposively selected and participated in the study to identify their perception and teaching practices of EE components in their subjects. Five classroom lessons were conveniently identified and observed to verify how EE contents and issues are integrated and taught. The study followed the principles of qualitative case study method and underpinned by integrated EE model as its framework.

This chapter summarizes and describes the findings as derived from evidence categories and refined into clusters of sections as well as subsections on the basis of the research questions formulated at the outset. Accordingly, the chapter constitutes the major findings, conclusion drawn and implications forwarded based on the results.

### **6.1. Major Findings**

#### **6.1.1. Integration of Environmental Education Contents and Issues into Primary School Curriculum**

Consistent with international consensus and its real context, Ethiopia commits itself to integrate EE into school subjects. Cognizant of the role of EE to develop environmentally literate and responsible citizenry for maintaining sound and sustainable environment, the study evidence was obtained from textbook review, interview, and lesson observation in order to address the basic research questions posed in chapter one. Therefore, the findings on state and approach of integration of EE into primary school subjects and teachings of these components are summarized in this part. Moreover, emerging issues and meanings manifested in the evidence are also reflected on.

The finding confirmed that EE components are covered into primary school subjects at varying scope and emphasis. It was found that EE components are relatively sufficiently integrated into science subjects notably biology (Environmental Science, Integrated Science, Biology) and geography(Social Study) but integrated only to a limited extent into other subjects like English and Mathematics (see Appendix 4 Table 1 and 2). The result of the present study is partly related to similar and contrasting studies (e.g. Palmer and Neal, 1994; Lydia, 2011; Lydia and Peter, 2013) in recognizing and integrating or connecting different subjects and revealing contents of EE of natural and built environmental dimensions.

Moreover, the understanding emerged from interview evidence showed that the restriction of curriculum experts to edition of textbooks and absence of clear integrating criteria as well as absence of guiding body at center are considered as limiting conditions to EE integration into primary school subjects. Absence of responsible coordinator at center and lack of clear criteria for integrating EE and sustainability component into school subjects as deterring factors deserve attention for it suggests direction of what to teach and how to deliver it at primary schools. Lydia (2011) explored a result(in Tanzania) similar to the present study finding, that depicted lack of clarity on how EE is integrated into the curriculum, and concerns exhibited by curriculum developers regarding absence of clear specification of EE elements in the school curriculum.

The issue of adequacy or sufficiency of EE contents appears debatable related to the EE nature and complexities of environmental problems prevailing. However, suggestion of different authorities like (Palmer 1998; UNESCO 1994; Tilbury 2005; Sarmah and Bhuyan 2015-see appendix 6, p 277) could be considered to note the variation of state of coverage of EE into school curricula. For instance Palmer (1998) claims that any curriculum analysis to examine the adequacy of EE into primary school should be guided by seeking an answer to the question: “Do students have as many opportunities for EE learning by observing, measuring, recording, interpreting and discussing what has been observed”. Importantly, what palmer emphasized is the three integrative “threads”- education about, in and for environment need be generally recognized for EE content decision. The present study, drawing to this view, applied the modified model that I referred as to Education in, about and for environment.

In this sense, the result of this study showed that EE components appear relatively sufficient in the first cycle (1-4) of the primary school curricula compared to the second cycle (5-8). This can be partly explained by the difference in the approach of organizing the subjects' contents. Other limiting factor to the integration of EE into primary school subjects include: time pressure, lack of teaching materials, and preparing students for national exam were also reported as causes of ineffective integration of EE components into the school subjects. Fitzgerald, 1990 cited in Aklilu, 2012 identified similar result arguing that EE is not integrated into Ethiopian traditional syllabuses as expected. In effect it could be generalized that EE components are not sufficiently integrated into all primary school subjects and all levels as intended. Because notwithstanding the barriers mentioned earlier EE is only sufficiently covered into biology and geography aspects of school curriculum and integrated in education about (e.g. knowledge focused) the environment way less regarding education in (e.g. skill and actions) and for (e.g. values and caring concern) the environment.

### **6.1.2. Approaches to Integration of EE Components into Primary School Curriculum**

This study discovered that EE components are broadly integrated into lower primary but decrease upwards and become linear in the upper primary. According to the finding, although most of the curriculum experts and school subject teachers appeared to accept the holistic or integration approach of environmental issues into other subjects, still discipline tradition (curriculum document data) that involved step-by-step procedures and partially top-down directed curriculum making situation prevails. The discipline-centered teaching of primary school subjects was preferred by some interviewees (Bayu, M; Gorja, M), perhaps partly due to subject matter nature difference and disparity in awareness and experience about EE among the experts and teachers. However, this position appears controversial to the holistic-integrative model of EE structuring which is assumed to foster meaningful environmental learning.

Then, it could be argued that in the context of primary schools, integrative approach is evidently relevant to environmental learning for it characterizes interdisciplinarity and pupils are relatively not abstract learners but learn better from concrete real life situation. Studies (e.g. OMoE, 2009 cited in Karrow and Fazio, 2015) revealed that integrated curriculum model is advocated for EE. It was contended that integrated curriculum portrays attributes like holistic, connectedness,

embodied, ecological and unified knowledge, relevancy to real world, and having epistemological basis, students learning and pedagogical importance that EE also shares (Beane, 1996; Palmer, 1998; Drake, 2007; Karrow and Fazio, 2015) as contrasted to traditional discipline centered model(linear model). Traditional subject centered curriculum model on the other hand stresses contents and enhances memorization of that content, thus it is characterized by (Beane, 1997; Paterson, 2003, in Etim, (edit), 2005) “fragmented knowledge and non-responsive to students needs”. Although subject based approach can not be ignored, integrated approach appeared more appropriate for teaching EE at elementary education level. In line with this integrated curriculum is perceived as leading to more interesting learning experiences, enabling to see big pictures, engages into higher order thinking and skills, unlike standards focused disciplines...(Vars, 2001b; Drake and Burns, 2004). The finding appears suggestive of the mismatch of the EE integration principles to the practices of EE integration into primary school curricula.

However, covering the EE topics, contents and issues do not guarantee the development of environmental literacy and environmentally responsible behavior unless applying integrated approach effectively in the teaching learning process.

### **6.1.3. Integrating EE and localizing Environmental learning at teaching-learning level**

The findings of the study indicated that although all the participants demonstrated positive attitude towards EE and its integration into primary school subjects (curricula) and environmental topics and contents are sufficiently incorporated into some primary school subjects (e.g. Environmental Science, Social study, Biology), teachers’ actual teaching does not seem effectively integrating environmental components in their respective subjects. In other words what they claimed tended to deviate from what they had practiced in their classrooms. It was found that almost all of the teachers observed confined to textbook information, prescriptions, and questions. The methods of teaching employed in most cases were traditional information exchanging type such as explanations, discussion, and question-answering as well as some activities.

Moreover, most of the teachers observed did not exhibit clear intent to relate their teaching to the environment. It was verified that use of local examples, and resources, relating learning to real experience, and connecting lessons to the environmental matters were not seen. The rich

indigenous environmental knowledge in the community was overlooked both at curriculum and actual teaching-learning level. The implication suggests that, though teachers are supposed to be resourceful, school leadership does not seem encouraging or allowing teachers go out of the stated curricular contents and knowledge or classroom routines.

The observation further implies teachers mainly focus on their subject matter content as described and scheduled in the curricular materials notably textbook. Thus, EE components are relatively taught in education about environment way as compared to education in and for the environment perspectives.

#### **6.1.4. Emerging Views and Meaning Manifested**

All ideas identified and the meaning learned from the textbook review data and interview evidence was summarized and their implications sought for. The key ideas and messages that emerged out of text information are overviewed and their implications discussed in this subsection.

##### **6.1.4.1. Natural and Cultural Environmental Interrelationship and**

##### **Sensitivity to the Environment**

Natural and cultural environment interdependence was manifested in many ways including economic activities, different layers of the earth and aesthetic and ecological values where insensitivity to environment is implied. Natural and cultural environmental aspects interconnection was noted from messages communicated; yet the implied interrelatedness appears to emphasize benefits that can be obtained from the natural environment. The interrelated influence prevailing between altitudes-climate-primary human activities (e.g. agriculture) explains this linkage. As evidence suggests, the dependence of the humans' survival and other living things on the natural environment is not directly focused and explicated in the subject messages. However, it was identified that the message related to earth's carrying capacity was implicitly exhibited via the comparison made related to the layers of the earth and its parts. These remind us the human—environment interrelationships; yet the extent (healthiness or destructiveness) of these relationships (Teshome, 2013), however, are dependent on the values that humans have for the natural environment. These relationships undoubtedly cause impacts on the environment and its elements. Human activities are known to perpetuate environmental crises

(Kassahun, 2003) focusing on Bamboo Forest investigation found out that large coffee and tea plantations and urban expansion are real and potential threats to the environment.

The contents covered appear voicing a warning echo for the need for more care for natural environment, evidently conveyed in the information dealing with the importance of atmosphere (e.g. preventing harmful rays(like ultraviolet) to life from striking the earth's surface). The implication reminds us of the responsibilities expected of human beings because, as experienced so far, human activities have been exposing useful atmospheric gases like ozone to depletion. I could claim in this regard that even those contents related to nature are referred to in the text mentioned in the natural way and sensitivity to the environment was not explained enough. Yet, as noted from textbook evidence, the natural environmental components, plants, are considerably described in the subjects' textbooks signifying their unique importance such as producing food and oxygen, generating economic values, keeping ecological balance, etc.

It is apparent from finding that connecting learners to natural environment so as to foster environmental sensitivity in them by extending opportunity to learn how their daily lives affect their natural environment and affected by it, need be focused. This could best be materialized by connecting students' learning to real experience and actual environment, thereby using the environment both as means and stage of learning in critical ways.

#### **6.1.4.2. Controversial Environmental Positions and Fragmented**

##### **Conceptualization of EE and Environmental Sustainability**

###### **a. Controversial Environmental Positions**

Evidently, curricular document content analysis and interview evidence illuminated contrasting environmental positions (with different emphasis) and fragmented conceptualization of EE and related issues. It should be noted from the finding that humans-natural environment relationship is manifested in many different ways such as economic activities, social and cultural factors and natural interconnection. According to the finding of the study, beneath the contents covered and explained, the dominance of anthropocentric environmental belief over the eco-centric view was identified. Anthropocentric view is a human centered belief where environment is considered worthwhile only in terms of the benefit and/or resources humans explore from. Emphasizing

anthropocentric position, humans are not considered as part of the natural environment suggesting that harmonious relationship of humans with the natural environment remains unforeseen. Most descriptions of textbook contents emphasized environmental use which implies seeing environment in terms of its benefit to humans. Corresponding to this view study (e.g. Mühlhäusler et al. 2006) indicated that environment is often equated with what sustains human life and pleases humans as a result most discourses are anthropocentric. Singh, in Tegegne et al. (1999) in similar way argued that man constructed notion of nature mainly with anthropocentric mind set and preceded with aggressive resource using predatory technologies to interact with nature.

On the other hand, eco-centric position can be seen as nature or earth centric view, which recognizes the intrinsic values of the natural environment and its elements along with the interdependence of natural environmental elements. The predominance of anthropocentric view over eco-centric view inevitably generates environmental raptures and complex problems in the process for humans own long-range survival with dignity and hope. As a result, reviewing the dominant view pertaining to human-environment relationships and deciding to flourish a balanced view is becoming critical in the contemporary world.

In a similar vein conceptualizing environment as exclusion of man and seeing man as controller (Bowers, 2003, 2006; Young, 2009 in Kuliaks, et al., 2013) of the nature tends to isolate humans (artificially) from their natural environment. This predictably conceals what humans have done to the environment as well as the corresponding corrective measures dare to be taken. There is little doubt in this sense that what we have done to the natural environment exceedingly surpasses what we have done for it. It was revealed that the previously better rapport existing between humans and their environment get disrupted; say during 1980-2000(Kemp, 2004) alone permanent probably irreversible environmental crises and natural resource deteriorations (e.g. soil, water, air forests) have been experienced at global scale.

Hence, it could be argued that although humans uniquely blessed to have intellectual insight and creative skills, they cannot be immune to environmental hazards (most caused by human activities themselves) encountering all other living environment or animals for they all possess life that makes them equally vulnerable to dangers caused to the natural environment. The explanation about improving human welfare through use of modern agricultural practice that applies modern

technology and chemical appears to undermine environmental care. This is evident from conflicting views manifested in the study. For example, interventions suggested to prevent harmful organism (via spraying chemical, clearing grasses and trees) appear contrary to the damage they caused. The result suggests narrow concern accorded to proper understanding and care for the natural environment as compared to the cost to be faced by the society at present and in the future. Thus, as human views, thinking, and actions are assumed to be causes of environmental problems, EE should be refocused and approached differently so that humans' views, thinking, and actions (related to interaction with environment) could be changed and improved. .

**a. Fragmented Conceptualization of EE and Environmental Sustainability**

The conceptualization and discourse of EE and related ideas appear sparse as revealed by the finding. This is evident from descriptions made in the textbooks, where environmental education is not explicitly mentioned in any of the subject textbook analyzed. Environment, as a concept, is only defined in biology textbook with objective denotation. The interview evidence also did not exhibit refined conception of EE and environmental sustainability because curriculum experts and primary school teachers perceived environmental science and related contents as subject dealing with environmental matters in the primary school curriculum rather than environmental education. I considered this situation as fragmented conception and discourse of EE and environmental sustainability which may imply the gap that thinkers (researchers) and policy makers should consider.

Emphasizing the concept and view pertaining to EE could contribute to awareness development about the subject and help to identify the link between knowledge, value, and action of the educational practitioners. In this sense, it is contended that (Hwang, 2008; Robertson and Krugly-Smolska, 1997) teachers' belief and values could suggest their thinking and examine the connection of teachers' knowledge and actions. It is also asserted that in order to integrate and teach EE teachers should have a comprehensive and refined conception of what EE entails.

**6.1.4.3. Environmental Ethics and Environmental Problems**

Environmental ethics (modern) view was identified as describe in a few subjects like biology textbook. It is evident from the curricular message conveyed that emphasized the merciful feeling, respect and care for all living creatures are crucial. Local (indigenous) natural

environmental protecting experience was also rarely incorporated into a few subjects, particularly Afan Oromo and Social Study. The fact that, the customary way of protecting the natural environment is narrowly reflected but not mentioned enough in the subjects mentioned, this justifies the neglect of environmental ethics in the whole primary school curricula. In spite of its importance in terms of environmental care, Indigenous Knowledge (IK), (Sheya 2014) is both ignored and underemphasized in schools.

Environmental ethics reinforces a positive view towards the earth's environment and its protection, remedying environmental problems. It is obvious that untapped environmental knowledge and beliefs (pro-environmental) exist (Workineh, 2001; Dixon and Wood, 2001; Teshome, 2013; Dessalegn, 2014) in Ethiopian community experience, (e.g. Oromo, Konso people) but not well studied and included in the school curriculum. Consequently, partly because of this, environmental problems have persistently been increasing in magnitude and severity than decreasing.

The prevalence of pro- environmental indigenous environmental knowledge and experience (Sarabhai, et al. 2002; Teshome, 2013) often reveal the history of co-existence of humans with their natural environment in a sustainable way. The long stayed and culturally rooted IK pertinent to environment and scientific knowledge of EE can inform each other and contribute to the proper understanding of and care for the natural environment. The findings also showed the incorporation of environmental problems, causes, impacts and some methods of preventing the problems. Human activities induced problems like deforestation, soil erosion, water wastage, and pollution; the ways of conserving these and related natural resources were communicated in the subjects' textbooks.

In spite of the environmental messages communicated and consideration given to environmental education, human activities remained the causes of "ecological and social crises" (Gruenewald, 2004). Thus, that human-natural environment relationship is perceived unsustainably. I would prefer to borrow phrases of Holt and Winston (2002) to describe the severity of the environmental problems I noted from the study result. Our essential natural resources are in danger because the air is "unhealthy to breath", the water is "harmful to drink", and soil is "filled with poison", suggesting that the earth is sick and in great danger. Consequently, the urgency of change in human thinking, attitude and action regarding their relationship with environment via education

(education in, about and for the environment) is undoubtedly evident so as environmental literacy, responsibility and sustainability can be realized.

## **6.2. Conclusions**

Integrating and teaching EE into school curriculum is indispensable. Primary school is considered as appropriate level to lay foundation for environmental understanding, developing a caring value and skills of protecting in young children. Integration of EE into all Ethiopian primary school curriculums has Education and Training policy and curriculum guide support (TGE, 1994; MoE, 2010) and favored by curriculum official and experts and primary school teachers. However, EE integration was found to be different in coverage and approach by subjects and cycle. It is sufficiently covered only in science subjects like biology and geography from social study. EE relatively appeared sufficiently incorporated at lower primary compared to upper primary. The inconsistency between EE related curriculum development and the practice of integration were partly attributed to barriers: lack of clear criteria and facilitating body for the integration of EE components into all subjects. More over, difference in subject matter nature, restricted role of curriculum experts and the difference in awareness and experience among experts on concept of EE and its integration into other school subjects, as well as Fragmented conceptualization and discourse of EE were found to constrain EE understanding and its integration into primary school subjects.

The approach followed to integrate the EE components is expected to have implications on its integration into school subjects. Hence, it was found varying from integrative (e.g. Environmental Science and Aesthetics subjects) at lower primary to sub-integrative (e.g. Integrated science and social studies) and linear (e.g. civic, physics) mode at upper primary. These integration levels are comparable to Fogerty's (1991) curriculum integration continuum of integration, connected and fragmented levels respectively. Though integrated approach of curriculum development is perceived appropriate for primary school (Beane, 1997; Drake, 2007; Lydia, 2011) children learning, linear or fragmented integration model tend to predominate at primary school under study. The study evidences also disclosed that the important environmental ideas: sensitivity to environment, care, protection and respect for environment, and local environmental experience were not considered and mentioned enough. Teaching EE as integrated component in primary school subjects appeared rigid for it involved textbook confined, classroom limited, teacher

dominated methods and rare options of connecting to environment and community, lack of clarity and miss-sequencing of some contents, inconsistency of contents, and learning activities with time allotted, etc. were also reported as challenges to the integration process. Consequently, in general EE components and issues are not sufficiently integrated into all primary school subjects and all levels as intended. Because (notwithstanding the barriers mentioned earlier) EE is only sufficiently covered into biology and geography aspects of school curriculum and integrated and taught in *education about* (knowledge focused) the environment way less regarding *education in* (skill and actions) and *education for* (values and caring concern) the environment. Therefore EE as presently designed and taught is constrained to lead to the attainment of environmentally literate, concerned and responsible citizenry development.

### **6.3. Implication of the Study**

Many implications may be drawn from the finding but the following are emphasized here. The study result revealed gap in areas of curriculum making to specify and facilitate EE components mainstreaming in the primary school curriculum. Shift of emphasis and practice is required in this regard in that focus should be given to learning than teaching, process and methods than subject contents, integrative environmental learning than linear subject based approach, environmental concern and action than knowledge and adapting the integrative model for EE planning and teaching. Therefore curriculum policy decision makers and curriculum developers need to rework regarding curriculum development process. It is suggested that integrated curriculum model is relevant for incorporating EE components into every subjects of primary school and appropriate for interdisciplinary subjects such as EE. Integration of EE components into primary school subjects should make inter-disciplines connections and with outside environment. The integrated model approaches (Palmer, 1998) and the continuum of curriculum integration approach (Fogerty, 1991) deserves consideration in this case. Because, students are engaged in their learning as they make connections (Lake 1994) across disciplines and with the world outside the classroom.

Integrating EE into school subjects is appropriate for proper understanding of human-environment relationship, and to respond to the dynamic and complex environmental problems. Policy makers and curriculum developers thus, are expected to make syllabus and textbook clear and relevant to

context, establish EE integrating facilitating body, and provide clear criteria for the integration of EE components into all school subjects and grade levels. It is also worth refocusing on continuous curriculum revision on the basis of need assessment and adopting integrative EE model.

Against the disparity of teachers' teaching competency and awareness about EE it is suggested that empowering primary school teachers via in-service orientation and pre-service preparation, reinforcing continuous professional development and provision of proper support and incentives both at federal and regional level. Opportunity shall be created by educational leadership agencies of federal and regional levels for teachers' professional growth and competency. For example establishing link with higher learning institutions and engaging in profession skill trainings including the the teaching of EE components as integrated into school subjects.

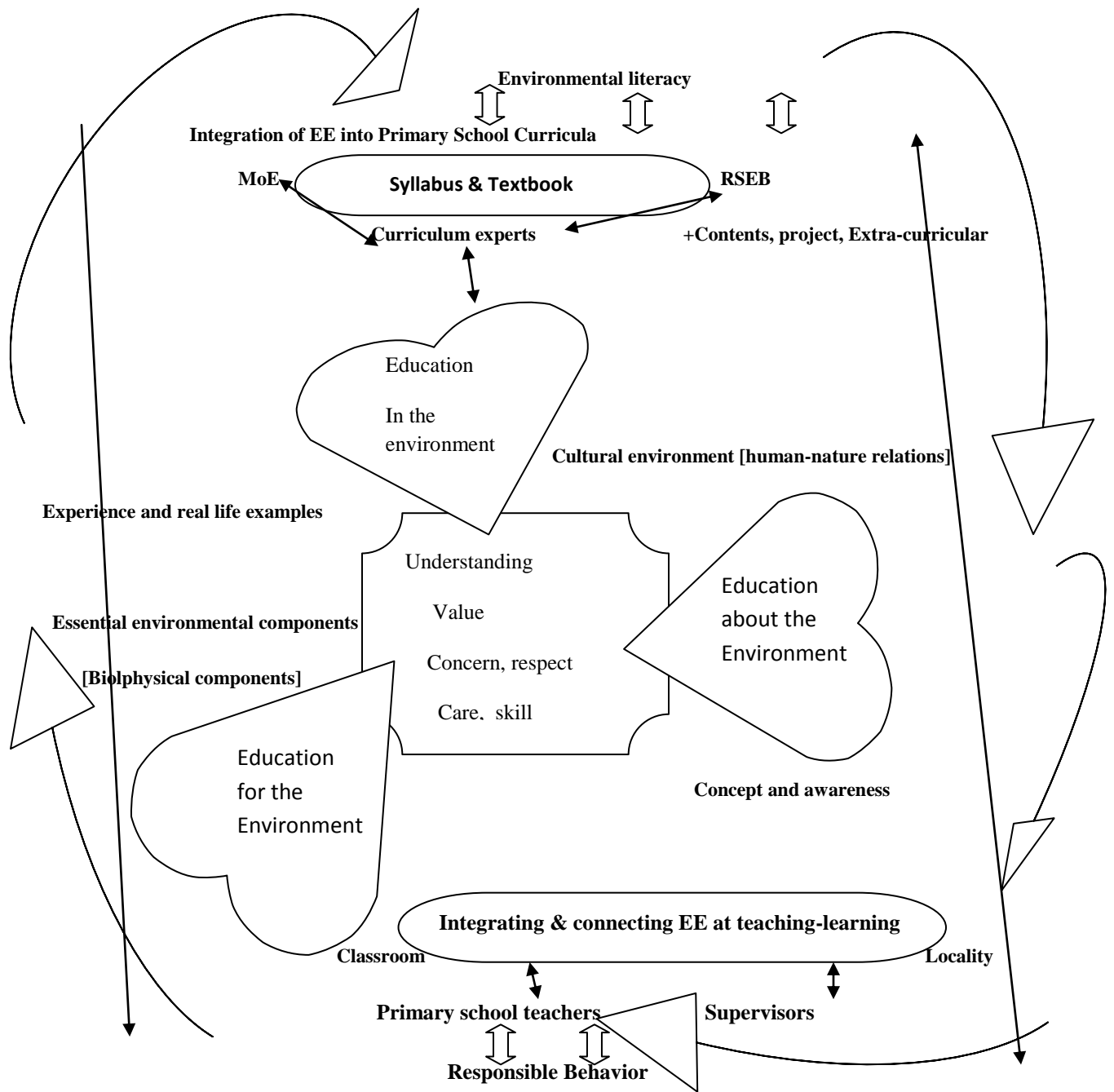
Educators and researchers in education including integrated EE curriculum shall reconsider their work dissemination in a way it could be communicated to school level community so that the barriers between education theorist and curriculum developers and thereby teachers can be bridged. I also learned from the study that the study pulls attention toward EE-ESD related debates. The contention involved changing EE by ESD opposing the continuation of EE on one hand and supporting the continuation of EE by rejecting introduction of ESD. The latter position held (Jickling and Wals, 2008; Robottom 2007; Cartea, 2005) appears sound. Because replacing EE by ESD is not progressive change and as it was claimed (ESD is not well established, lacks foundation and clarity) compared to EE. Moreover, it is argued that ESD intends to advocate for economic growth and attempts to rename EE as ESD is unjustifiable. In the same vein, EE appear broader to deal with the issues (Society, development and environment) the ESD was claimed to address. ESD marginalizes environmental care while emphasizing economic development; in contrast EE considers environment (natural and cultural) humans-environment mutual interdependence and consequence of these interactions (evvironmental problems) as well as the interventions expected. Therefore, Environment is a bigger circle that puts in the other small and smaller circle of society and development respectively. Thus, researchers in the area are expected to reinforce and refocus the EE-ESD related debate trend for more discourse.

In order to change, the fragmented conceptualization of EE and related concepts, rigid and traditional teaching approach (inconsistent to "active learning via doing, observing and dialogue"

MoE, 2010), teacher educator of pre-service teacher education and school teachers have to review their practice of integrating and teaching EE components in all subjects of their respective levels.

Finally, as human views, thinking, and actions are assumed to be causes of environmental problems, EE should be refocused and approached differently so that humans' views, thinking, and actions (related to interaction with environment) could be changed and improved. In this regard for development of environmental literacy and responsible behavior into the children and youth I suggest the integrated EE model to be reflected on and considered both at curriculum making and learning levels. Integrating models (Fogerty, 1991; Palmer, 1998) are relevant for incorporating EE contents, issues and messages into all primary school subjects. Thus, I recommend change model involving *Education in/through, about and for the Environment* with understanding, values, concern and respect, care and skills as core goals to guide the integration of EE into primary school curricula. The primary school curriculum development (e.g. syllabus design and textbook writing) adapting the suggested EE model shall be based on clear criteria or standard to integrate EE components. This is expected to be carried out by joint efforts of Ministry of Education and Regional State Education Bureau based on need identification. Likewise, integrating and connecting EE components with experiences and resources of the locality or real environment shall be considered at teaching-learning level. In similar vain, inorder to enrich environmental learning and human-environmental relationship understaning, it is recommendable to inject environmental project into the extra-curricular programs of the school. In this regard noting Wragg's (1997) in his book-cubic curriculum summarizes the three components of curriculum namely subject matter (contents), methods of teaching and extra-curriculum programs to be consided in the curriculum development process. Furthermore, it is also important to consider that the national curriculum intents and components should be strongly connected to the real life and indigenous environmental experience. The model that illuminates these is presented by the following figure.

**Figure 6: Proposed EE integration model for primary school curriculum**



**Source:** Developed by the investigator based on ideas obtained from literature (e.g. Palmer, 1998) and study evidence.

Generally, it is believed that if the planning and implementation of EE as integrated into primary school curricula considers the proposed model and apply the integrating components (the three

threads education in, about and for the environment) in balanced way based on context, the desire of developing environmentally literate and responsible generation can be a reality as illustrated by outer bended arrows. Importantly in the process of EE curriculum making and teaching, the developers at Ministry of Education (MoE) and Regional State Education Bureau (RSEB) shall inform the implementers' represented by classroom and locality in figure 6 above and be informed of the feedback and felt need from the locality. The two way information exchange importance is implied by the straight arrow stretchd from top to bottom and vice versa. Likewise, in addition to the previously recommended components, in this model it is recommended that environmental and sustainability issues shall be considered as project and extra curricular learning to enrich the formal learning.

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## **Appendices**

### **Appendix 1: Data Gathering Instruments**

#### **A. Interview Guide for Curriculum Experts and Teachers**

**Addis Ababa University**

**College of Education and Behavioral Science**

**Department of Curriculum and Instruction**

Dear participant, my name is Abera Hussien, a PhD candidate at Addis Ababa University. Presently I am doing research for my PhD dissertation. The aim of this interview is to understand how environmental education (EE) components are integrated into primary school curricula [from your perspective]. The results of this interview will be used for academic purpose only. All information you provide me with will be kept confidential and there will be no way that your responses will be identified. Hence, I kindly request you to involve in this interview conversation. Thank you for your cooperation in advance.

Background Information: Field ,..... Experience, ..... Responsibility .....

1. Comment on how the concepts of environment, environmental education, education for sustainable development are framed
2. How do you see the integration of EE into all primary school subjects? If important why?
3. How and to what extent EE contents are incorporated into all primary school subjects? Probe: Principle(criteria), guiding, scope
4. Conscious effort of integration of EE components into primary school subjects  
Probe: Framework, awareness
5. Implementation of EE components in other primary school subjects  
Probe: indicators of integration (curriculum, local experience), monitoring mechanism
6. How much do primary school teachers demonstrate the competencies in integrating environmental education in the actual teaching-learning process?
7. Suggestion on how best EE components could be incorporated into the primary school subjects
8. How do teachers consider knowledge, values, skills, environmental ethics, and actions in the process of environmental education teaching-learning process
9. How do you see the approaches of integration of EE components in contributing to the development of adequate knowledge and responsible action for environmental care and protection
10. How are students supported to learn EE contents in different subjects of the primary school

**B. Lesson Observation Guide and Schedule for Primary School Classrooms**

Open observation approach will be used to identify how primary teacher teach EE components in their subject and connect to the locality

Stages of instructional process	Classroom and related events		Remark
	Occurring events	Non-happening but expected	
phase I (inclusion or introduction level)			
Phase II (Core activities of the lesson )			
Phase III (conclusion level)			

Post observation discussion and comments.....  
 .....

**C. Schedule of Data Collection in the Academic Year 2016/17**

**Curricular Document**-Textbooks and syllabus **Analysis/ review** .....December---- May

**Interview** with curriculum experts-National and Regional levels.....December----February

**Interview** with primary school teachers.....January-----March

**Classroom observation** and In-depth interview.....March-----May

## Appendix 2: Participants Background Information

Table1. Curriculum Experts and Primary School Teachers involved in the Study

No	Participants	Sex		Subject area		Qualification		Experience in years			Remark
		M	F	Natural Science	Social Science	1 <sup>st</sup> Degree	2 <sup>nd</sup> Degree	13-20	21-30	>30	
1	Curriculum Experts	10	-	4	6	3	7	4	2	4	
2	Primary School Teachers by setting	M	F			Diplom	Degree	5-15	16-25	26-35	
2.1	Dedo	2	4	3	2	4	1	4	---	1	
2.2	Gera	2	2	2	2	4	--	3	---	1	
2.3	Mendera	2	4	3	3	4	2	2	1	3	
2.4	Seka	4	2	4	3	5	2	3	1	3	

## Appendix 3: Interview Transcript

### I. Curriculum Experts' interview Transcript

(MB03-Misso)

**Interviewer: 1. How do concepts of environment, environmental issues and contents and sustainability are perceived in your subject area context?**

**Interviewee:** “ well in my view as it is integrated in science subjects, environment is conceptualized as social environment, natural environment and individual environment; particularly in the context of lower primary school curricula environment can be understood as everything around the child”. “Regarding environmental contents and issues, elements from learners surrounding will be the topic of issues in broad term or integrated broadly including relevant social, natural phenomena from their area without compartmentalizing”. “But as grade level increases the broadness of subjects’ decreases and the subject tend to become specific and take their discipline nature. For example for 5-6 the science subjects are structured in one as integrated science. Whereas for 7 and 8 grades the three science subjects independently designed as pure biology chemistry and physics incorporating environmental education contents according to their relevance to each topics of the subjects mentioned”. Natural science, social since study differentially increases vertically?. “As sustainability matter consideration, if you are talking about environmental sustainability inclusion, the curricular materials must be investigated and I am not sure. On the other hand, effort made to incorporate natural environment components may suggest the emphasis of sustainability concern”.

“ Natural environmental issues are integrate in science area spirally from broad at lower primary (1-4), somewhat less broad at 5 and 6 and compartmentalized at 7 and 8 grade levels on the basis of maturity level of target learners”. Finally “ I believe in areas I know (science) environmental issues and contents expected have been incorporated; however, the environmental education or environmental studies expert exploring the curricular material may have different view from this”.

**Interviewer: 2. How the integration of EE contents and issues into a primary school subjects is viewed? And why?**

**Interviewee:** “Theoretically integrating over arching or cross cutting issues are mandatory at state syllabus level into all subjects”. “Education and training policy as well as curriculum framework urgent us to incorporate the environmental contents and issues -የትምህርት ፖሊሲ ያካባቢ ( ባለ-ብዙ ዘርፈ) ጉዳዮች እንዲካተቱ አስገድዷል:: Therefore it could be claimed that theatrically it is recognized”.

**Interviewer probe: good,** is the integration at similar of equal footing into all subjects of the primary school subjects?

**Interviewee:** “I could say that practically EE contents and issues are not equally integrated into all primary school subjects, probably due to different reasons such as :

**1<sup>st</sup>.** difference in knowhow and experience among subject experts in integrating environmental contents into other subject

**2<sup>nd</sup>.** subject matter nature difference, some subjects have more topics related to environmental studies components than others”.

In respect to the why or importance of integration of EE contents and issues into all primary school subjects, it is considered important because EE is internationally recognized and all governments of the world states accepted it to incorporate into their respective educational systems. Above all, due to our own natural concern, situation and real environmental problems, (e.g. environmental degradation, drought, pollution etc), we are forced to consider and integrate environmental issues and contents to teach our new generation starting from primary school.

**Interviewer: 3. To what extent EE contents and issues are incorporated into primary school subject textbooks?**

**Interviewee:** the integration of environment issues and components depends on the subject nature grade level situations. Accordingly, the extent of integration of environmental topics, or contents differs from subject to subject and grade level to grade level. Specifically for the lower primary level (1-4) environmental science as its name suggest covers adequate environmental contents and issues , I could say there is full integration of environmental issues and contents. But in the upper primary level (5-8) the extent of integration related to environment tend to be sparse (thin). In 5-6 grade levels though, the integration is not as that of 1-4 grade level relevant contents and components of environmental education have been incorporated in the integrated science, hence there are coverage of environmental topics on the basis of their relevance (interrelatedness) to the science subjects and the potential of the marked topic to carry environmental issues and contents ; in other word, as long as the main topic carries the issues, and contents of the environment integration of EE contents and issue are possible.

Memo-It is determine by the relevance to the host subject's nature (attributes)?. Even in subjects' expected contain more environmental contents and issue due to its nature. Gap?

In the case of 7 and 8 grade levels similar trend applies, but at these levels the science subjects stand independently as biology, chemistry and physics; as a result for each starts to take their pure shape the incorporation EE contents and issue, relatively appear less vivid particularly in chemistry and physics.

For probing question added as if there could be issue of urgent to be considered in curriculum content what can be done? In such instance, the curriculum already developed immediately nothing to do, but we can react by preparing supplementary curricular materials, arranging training and refreshing courses for teachers, updating professions, initiating club formation and NGOs involvement to improve the situation and promote understanding. Seems unrelated.

In sum ‘’ the scope of EE contents coverage into other subject is determined by contents and issue relevance to the host subjects. The criteria used for EE contents inclusion in other subjects is K-12 curriculum frame as a major guide line.’’

**Interviewer: 4. Whether there is or no conscious effort to integrate EE contents into primary school subjects?**

**Interviewee:** “Some expert exhibit conscious effort in integrating EE components while others lack experience and know-how. This reminds us that, there is something to be done in areas of curriculum development related to empowering experts in integration of overarching issues including EE elements. There is gap in science. The understanding emerged out of the interview conversation is that curriculum experts are not equally aware and experienced in integrating elements and cross-cutting issues like environmental education components.

**Interviewer: 5. How do see the Implementation of EE as integrated into other subjects of primary school?**

**Interviewee:** In this regard monitoring or evaluating the implementation of primary school curriculum outside of the state ministry level mandate. Mainly monitoring is the responsibilities of the respective regional state educational bureaus. *However, I can remind you the good experience prevailed in past when there was a project known as environmental program project funded by Swedish organization, which had planned and worked with schools on environmental learning and strictly monitoring the implementations of the project plans but ceased operating long ago.*

**Interviewer Probing:** How do you see the alignment of policy directives and the actual implementation of the integration environmental issues and contents into primary school subject, including consideration of local experience?

**Interviewee:** it seems unrelated due to mandate question, yet the federal level curriculum experts can conduct research on problems related to implementation at primary school level. Regarding the integration of local experience (knowledge), the attempt will be made to monitor local experience integration through checking of the attainment of

the designed competencies. ለምሳሌ ችግኝ ተከላ በት/ቤቱ፣ በቤትና አካባቢያቸው እንዲለማመድ ተቀርፀዋል ወንዝ ጠረጋ... ወዘተ:: But we can say that, there is opportunity and instances of inclusion of local experiences in primary school subjects, yet we cannot be sure for adequate integration of these experiences.

**Interviewer:** 6. how much do the primary school teachers demonstrate the competencies in teaching environmentally integrated subjects?

**Interviewee:** hi ‘’ I noted problems in this regard, though, not at equal level, there could be problem in handling EE integrated subjects. Hence we have to prepare our primary school teachers in EE or environmental content teaching in other subjects. We have not done adequate job in this regard’’. (በስርዓተ ትምህርት ላይ መምህራን ማዘጋጀት ላይ ገና አልሄድንበትም::)

**Interviewer:** 7. What is your view on current status of primary school subject textbook writing.

**Interviewee:** For 1-6 grade level textbook preparation, I do not have idea, but what I know is about 7 and 8 grade science textbook writing. “Authors are hired contractually by bid via international wide competition, where the MoE curriculum experts only involved in the final reviewing. Yet I have not been satisfied with their textbook quality, this is because, the last opportunity of reviewing does not enable one to make substantial contribution.

Memo Thus, this implies the existence of gap (defect) in the process of subject textbook, writing in the context of primary education.

**Interviewer:** 8. Suggestion for further improvement regarding integration of environmental issues and contents into other primary school subjects

**Interviewee:** at the federal level), a body responsible for running environmental issues and components integration into school subjects should be in place. For example it could be started with environmental project and more initiation and motivation of planning and implementation can be more focused.

## 2. ( 018 or MG02-Emiru)

**Interviewer:** 1. How the concepts of environment, environmental issues and contents and sustainability concerns are understood in your subject area?

**Interviewee:** The question of environment begins with setting objectives and contents. In the lower primary for example the name and the nature of the subject environmental science reflects the consideration given to the environment. Environment is considered important for our life depends on, we get resources and means of life from our environment. በት/ቤት, የጓሮ አትክልት ልጆች በአካባቢያቸው ከቤት ሲወጡ የሚያዩ ሁሉ አካባቢ (environment) ተደርጎ ይወሰዳል:: 1-4 environmental science 5-6 integrated science, social studies

**Interviewer:** 2. How do you see the integration of environmental issues and contents into all primary school subjects?

**Interviewee:** all subjects incorporate environmental contents though at different footing. Some subjects of primary school like science and social studies cover more of environmental issues while others such as Math’s, language include less. Those covering less of environmental issues and contents are due to discipline nature variation or un-relatedness of contents to some subject nature affect the coverage of environmental topics into other subjects. The importance EE component integration is recognized in our system, this is because environment is vital in supporting life on the planet and it is also considered as cross cutting issues in education and training policy document.

**Interviewer:** 3. To what extent environmental education components are incorporated into primary school subjects.

**Interviewee:** It is integrated into all subjects at varying scope, biology environmental science, integrated science and social studies for instance contain more of EE components. In such subjects we can say EE contents and issues are adequately covered. The approach of integration is spiral where the scope increases upward from addressing local toward the world wide along with the increment of complexity and depth.

Related to social studies or geography, the approach of structuring follow, 1-4, integrated 5-8, and social studies

In the case of social studies the content coverage of the primary school subjects increases in scope from simple to complex and local to global. Pertaining to criteria used to integrate EE contents and issue, in social studies of the primary school subject, the area coverage will be considered where contents related to the learning surrounding ( local

issues ) are first included and grows outward and increase in complexity and depth depending on the maturity level of the pupils.

**Interviewer: 4. What do know whether there is or no consciousness effort to integrate EE contents and issues into primary school subjects**

**Interviewee:** “There is conscious effort to incorporate EE contents and issues into primary school subjects, because it has policy support and curriculum framework induced. Awareness wise there has been attempt to orient and involve key stakeholders such as parents, teachers’ curriculum experts of federal and regional levels and university professionals during the preparation of the syllabus.

Memo Explanation of process of curriculum preparation and the role of the federal and regional state in this interaction, understanding emerged revealed that, syllabus of different subjects (primary to secondary school) are prepared at the center by ministry of education in English then regional state education Bureaus translates, and adapts to their respective local languages, and situations. While adapting to their context, regions are required to maintain the centrally set goals (competencies) and core contents to meet the national standard. To make the curriculum meaningful and relevant to the students’ real life they are free to include examples and enrich the contents using the experience from their surroundings.

Need assessment based, involves the stake holders, and professional (experts).

**Interviewer: 5. How do you see the integration EE content and issues into primary school textbook and implementation of EE as integrated curriculum?**

**Interviewee:** ok, Textbook and teachers guide are developed from the syllabus. The adaptation is based on the competence set at the syllabus level with identified knowledge, skill and value areas. The textbook is currently written by subject specialist hired by international bidding funded by World Bank. The federal and regional level curriculum and subject experts involve in reviewing. The implementation of the integrated subjects is monitored through sampled schools from regions including observation of certain classrooms. Textbook writing issues places in local language taking in to account the context of the regions. The federal and regional curriculum and subject experts’ role except a few are limited to reviewing. This inevitably restricts the opportunity of maintaining relevance and inclusion of local experience and knowledge related biophysical of environment. Specifically the effective integration of indigenous knowledge (e.g pro environmental behavior) consideration opportunity) appear doubtful.

Memo. The message conveyed from the interview conversation suggests that it is sensible that the preparation of the syllabus aligned with the education policy and curriculum framework, but the translation of this standard to the textbook tend to mirror certain defect in that the textbooks are written by any subject professionals who win the competition of the international level bidding. There is opportunity to include. Integration of EE contents and issues practice starts from textbook writing and further the implementation of the environmentally integrated subjects..

**Interviewer: 6. Do primary school teachers demonstrate competencies in teaching EE contents and issues as integrated subjects?**

**Interviewee:** Teachers handle or address what has been integrated into their respective subjects particularly in social studies; there are no felt problems in this regard. However, related to the inclusion of current issues of environmental concerns there could be certain limitation. In this connection teachers’ personal commitment and concerning sectors support in equipping with necessary know-how and skills may be limiting factor to teach the components in the desired way.

**Interviewer: 7. What is your comment on primary school textbook writing?**

**Interviewee:** the primary school subject textbook writing is funded by World Bank where the writers are hired contractually on the basis of international bidding. Currently the produced textbook will be reviewed by the curricular experts of federal and regional levels; later reviewed and translated by professionals who speak the language of the local regions (e.g. professionals and teachers). Nevertheless, the quality of the produced textbooks of the primary school subjects may be problematic; probably due to different factors still these require investigation.

**Interviewer: 8. What is your suggestion for more inclusiveness of EE contents and issues**

**Interviewee:** አሁን ያለንበት ሁኔታ በተቻለን መጠን የአካባቢ ይዘትና ጉዳዮች በትምህርትና ስልጠና ፖሊሲ ውስጥ ባለብዙ ዘርፍ( cross cutting issues ) ተደርጎ በመታቀፉ በሁሉም የትምህርት ዘርፎች በሁሉም ደረጃ ትምህር ውስጥ እንዲካተት ተደርጓል። ለወደፊቱ ግን አሁን እየበዛ የመጣውን የትምህርት ዓይነቶች( disciplines) ከግንዛቤ በማስገባት environmental contents and issues more inclusive እንዲሆን ጥናት ላይ የተመሰረተ የማሻሻል ጥረት ማድረግ አለበት አላለሁ።” For more inclusiveness of EE components, there should be investigative work to be carried out”.

**4. ( 019 or ME04-Legesse)**

**Interviewer: How terms such as environment, environmental contents and issues and sustainability concerns are conceptualized interims of primary school subjects including language?**

**Interviewee:** in our primary educational system the environmental issue and contents are covered well in environmental science not as environmental education as it is being delivered for 1-4 grade level. In lower primary school particularly environmental components are delivered in integrated way comprising content areas from different discipline and presented as environmental science. Integration is assumed to help students understand their environment and its components in a broad and meaningful way. Environmental sustainability is not noted in English language curriculum of the primary school level.

**Interviewer: 2. How do you see the integration of environmental issues and contents into all primary school subjects?**

**Interviewee:** environmental issues and contents are not incorporated in English language as main stream but as medium for language learning. The main target is language skill development in the context the current primary school English language curriculum. Hence, environment related contents are considered and included to support the language skill development intended. Be more clear, in the primary English curriculum, the available contents are used for teaching language skills and the integration of environmental issues and contents are among these, and I could say it is sub integrated because language teaching focuses on skills and this only invites limited contents of the environment. EE contents and issues are integrated ( sub integrated) into language specially English not as important theme with intention of environmental learning but mainly to be used as examples and contents area for teaching English language skills.

**Memo** EE issues and contents are sub integrated into primary school English text books. The intention of integration is conveying the message and purposes of language skill teaching. Thus, the implication suggests that the integration of EE contents and issues are scarcely incorporated into primary school English subject curricula, because the expert in the area ascertained the environmental components are sub integrated. Moreover, I could claim that the integration practice does not contributing well to the understating and proper care for environments and its resources of the primary school students the reason behind this is according to the participants the focus of incorporation of environmental issues and contents are to serve language teaching.

**Interviewer: 3. To what extent EE contents and issues are integrated into all primary school subjects?**

**Interviewee:** in lower primary school (1-4) there has been less topics of environmental content coverage, of course to enhance language learning; contrastingly in the upper primary school English subject text book there is a better incorporation of environmental contents and issues, relatively still we should note that the emphasis is for language skill development.

Memo-the meaning drawn implies, the coverage of environmental issues and contents in the primary school English subject textbook appear inadequate. Incorporating, EE into lower and upper primary school English subject text are not meant to foster environmental awareness, skills and attitudes for proper care and protection of the environment and related issues.

Regarding the adequacy of the scope of environmental issues and contents coverage in the English subject text book, there are elements of EE components but it is difficult to judge the adequacy of the coverage since we do not have

clear criteria. Terms and contents related to environments are used to teach English language skills as described earlier.

**Interviewer probing:** What about the education and training policy directives regarding environmental contents and issues considering as part of the crossing-cutting issues to be integrated into subjects at all levels.

**Interviewee:** even though the policy urges us to incorporate environmental contents and issues, into all school subjects it does not specify the extent of coverage (scopes). However, there is some work ahead of us to make the environmental issues and contents more inclusive into the primary school language textbook during the next revision.

**Interviewer: 4. What can be said, whether there is or no conscious effort to integrate EE contents and issues into all primary school.**

**Interviewee:** there is somehow conscious effort to integrate EE contents and issues into primary school subject textbook including English yet with 'flat effort'. It does not seem sufficient; though there are no indicators of the extent of incorporating the environmental education components into primary school subjects. Hence, it seems recommendable to make measurable indicator for the integration of EE contents and issues in school curricula. Regarding the awareness of those involve in the curriculum development about the environmental component integration into primary school subjects, the text book preparation is done based on the predesigned syllabus. EE contents and issues are not specially related to subject matter, contents. In the case of English textbook of the primary school the approach is discipline oriented where the emphasis is placed on English knowledge, skills and attitude development and environmental elements are included to realize these purposes.

**Interviewer: 5. How do you evaluate implementation of integration of EE components into primary school Subjects indicators of integration environmental contents and local experiences**

**Interviewee:** Checking the implementation of environmentally integrated subjects of the primary school is not within the mandate area of federal curriculum experts. But EE contents and issue implementation as integrated into other subjects can be monitored as a supplementary content to teach English language skills. The consideration of indigenous knowledge/experience related to the environment (often meant to assist teaching the host subjects) appears sparse- there a few instance of local experience included into the primary school English subject textbooks. The included environmental terms, contents and examples are hoped to develop awareness and appreciation about the environment in the target learners.

Memo. Differently, it sounds less to think the scantily incorporated environmental issues and topics as well as local experience into the language textbooks of the primary school level can foster awareness and appreciation toward environments and its constituents. Because the core target is the language skill learning and the considered contents cannot serve the purposes that are not focused,

**Interviewer: 6. How much do the primary school teachers demonstrate the competencies in teaching environmentally integrated subjects.**

**Interviewee** Teachers' competencies in teaching environmental issues and contents in their subjects are mainly the concern of regional states. Still in this regard if the ministry of educatin is to involve in monitoring the teachers' efficiency, the key target of the evaluation will be English language skill teaching effectiveness not the environmental elements which is content as means.

**Interviewer: 7. Views of the interview on the primary school subject text book writing and its current status.**

**Interviewee:** The textbook writing is carried out by professionals mainly subject qualified individuals, still the language skills will be the main issue. The primary school English text book is written at federal level under the supervision of state education minister maintaining international standards, the main, issue being language skill.

**Interviewer: Suggestions forward for better inclusiveness of EE components into primary school subjects.**

**Interviewee:** reworking to specify and set criteria to integrate environmental issues and contents based on the nature of the subject matter.

#### 4. (MA01-Dula)

**Interviewer: 1. How do concepts of environment, environmental issues**

**and contents and environmental sustainability understood?**

**Interviewee:** environment can be understood through the identification of environmental contents such as forests, soil wild life. Environment is related to human life where by explaining it accommodates all we need to survive. Memo, but environmental sustainability does not seem focused in the expert's thinking.

**Interviewer: 2** How do you see the integration of environmental issues and contents into all primary school subjects? Why?

**Interviewee:** integrating environmental contents and issues is important and this is already stipulated and supported by education policy derives and curriculum k-12 framework. Environment related contents are treated through songs, plays, arts and different movements' integrations into aesthetic subject. Environmental component integration can also be addressed using music or song in such a way that singing about natural environment and its resources soil, water, forests (plants).

**Interviewer probing:** Is not applying song or dancing to address aesthetic contents including environmental aspect as means or method of teaching?

**Interviewee:** look, it is not, for instance music can be used both as method and convey the meaning (message) of conservation of natural resource and can raise awareness correspondingly. Moreover aesthetic components embedded with environmental contents areas can develop students' understanding about the need for environmental care and protection, as well as attract attention toward environmental issues and concerns.

Memo. However, as noted from the conversation outcome the incorporation of environmental education contents in terms of EE goals appear problematic. This is because the understanding emerging from the interview discussion suggests that environmental contents addressing via songs dancing or role playing are seemingly knowledge focused learning, and then one could claim that, a warning and motivation related to some environmental learning are not enough and guarantee the development of care and responsible behavior in students.

**Interviewer: 3.** To what extent and how EE contents and issues are integrated into all primary school subjects in terms of scope and criteria if any.

**Interviewee:** related to the extent of coverage of environmental contents and issues, there is explicit effort to consider environmental issues into all subjects, changes are being noted gradually. Specifically in the case of aesthetics answering this question also requires researching. In terms of adequacy of environmental contents and issues in other subjects, the lower primary school aesthetic, music and art (drawing, designing) dimension the coverage of environmental components can be considered as adequate. For examples creating songs, drawing pictures we can teach protected green areas vs exposed degraded environmental aspects and engaging students in critical reflection and debate.

**Interviewer probe:** Whether the use of criteria is known to decide on the scope of environmental contents and issues?

**Interviewee:** in the case of aesthetics environmental components are partially integrated as suggested by the education policy and k-12 curriculum framework principle. Why partial integration because teaching integrated curriculum is challenging in our educational system context. In aesthetics teaching music (song), sport (movements) and art (wearing different clothes) are expected to be applied in integrated model. But this is not a simple task

implement. Even in the partial integration approach, we encounter tremendous difficulties, where shortage of trained human power is one of the sensible constraints. Because it is apparently difficult for single teacher to be competent enough and motivated to handle multi disciplinary oriented subjects like aesthetics.

Memo.The understanding meaning contained in the interview communication reveals, interterm of designing and implementing contents which are environmental in aesthetics, the way it inspires critical thinking, which is consistent with the demand of this 21<sup>st</sup> century skills. However, treating environmental contents and issues, in accordance with the EE components and focusing on the depth and breadth of the key environmental contents areas and issues need be given due attention.

**Interviewer:** 4. What can be said whether there is or not conscious effort to integrate EE contents and issues into primary school subjects including aesthetics.

**Interviewee:** there is deliberate endeavor to incorporate environmental components into all primary school subjects including aesthetics, which can be affirmed from the education and training policy and curriculum framework documents.

Memo-It worth to reflect on the notion sensed from the overall communication of the interview in that sense, the participant exhibited hesitation while claiming the existence of conscious effort, that could be sign of lack of evidence to explain the emphasis accorded to environmental contents inclusion into all primary school subjects.

**Interviewer:** 5. How do you consider the implementation of the integration of EE contents and issues into other subjects of the primary school and linking to the local experience?  
The indicators of integration of EE contents and local experience into other primary school subjects

**Interviewee:** Federal level curriculum experts check and monitor the implementation from the feedback obtained from schools and teachers and even to some extent from classroom practices.

My concern here is about the less regards given to this subject, say in training and teacher preparation as policy demands, the limiting factor is lack of trained manpower in the area. Pertaining to localizing the environmental learning as component of aesthetics, due to the aesthetic subject nature, the inclusion of environment related contents and issues of lack experience into the subject is not a problem. For example if you take music, it is concerned mainly with the local experience or culture of respective regions of the country. Thus we have fertile ground both at the design (integration) and implementation of aesthetic subject to incorporate indigenous experience and knowledge. The evaluation mechanism varies depending on the involving bodies and level of mandate on the basis of the operating principles, this can be considered arguably.

Memo-The involved discussion further showed that integration of environmental components is ongoing and teacher and students also believed make the integration, but this aspect is not noted of at the central level as I felt from the critical examine of the conversation outcome. I could claim then the implication, might points to (related to ) the prevalence of gap between the central ( federal level ) curriculum plan and the grassroots level actual implementation practice in meaningful way. Thus factors contributing to this gap as participant spelt out is lack of qualified ( trained ) man power in handling aesthetes as integrated subject at all regions ( emphasize problems).

**Interviewer:** 6. **How much do the primary school teachers demonstrate the competencies in teaching the integrated environmental contents in other subjects?**

**Interviewee:** I feel the existence of clear problem in this area, because there is lack of trained teacher in aesthetics in a required extent, consequently there is the problem of competence in teaching aesthetics. Still we cannot deny and undermine the efforts made by some competent aesthetics teaching teachers working here and there throughout the country.

Memo The critical comment the participant made showed that, low awareness is noted about the importance, (value) of aesthetic which is manifested in low status accorded to it when compared to other primary school subjects, hence it can be considered as neglected subject area relatively.

**Interviewer:** 7. What is your observation about the textbook writing process and its current status.

**Interviewee:** At present time textbook writing is done by subject matter specialist hired contractually based on international bidding. Probably the writers in certain cases seem inexperienced both from the theoretical and practical point of view of curriculum material (textbook) writing. In this sense some of the textbook written recently tend to follow fiction writing style.

Memo-The meaning may remind us that the approach, because of lack of the technical awareness and skill of textbook preparation the available ones oriented a story telling materials perhaps it contains much information and less activities ( learning experiences). The textbook contents analysis result of the sampled primary school subjects also conform this fact.

**Interviewer:** 8. What do you suggestion for further improvement regarding the integration of environmental contents and issues into primary school subjects.

**Interviewee:** to make environmental education components more inclusive into all primary school subjects including aesthetics the following points should be considered.

- 1<sup>st</sup>. awareness creation about the importance of aesthetics
- 2<sup>nd</sup>. Focus must be placed on teacher training in aesthetics area
- 3<sup>rd</sup>. Considerable attention and enabling environment have to be created for educational quality enhancement including aesthetics. Technical and material support need be rendered at all levels.
- 4<sup>th</sup>. Continuous follow-up and assistance also have to be made related to problems of implementation.

#### **MEL05-**

**Interviewer:** 1. comment on the conceptualization of environment, environmental contents and issues of sustainability concern in teacher education curriculum context?

**Interviewee:** the concept of environment is dealt with more in environment science. However, in the case of main stream environmental components into teacher education curriculum so far the incorporation has been very limited. “ በተወሰነ መልኩ ነካ ናክ ተደርጓል። But very recently, or starting from 2012/13 or 2005 EC, there has been effort of introducing environmental component aspect as an independent course known as cross –cutting course with 3 credit hours targeting principals and teacher of the primary school. In this course, life skill, HIV-AIDS, environmental issues text are the key themes integrated.

Thus, presently teachers training system considers the overarching issues among which environmental aspect included, consequently one can see clear distinction between the old teacher education curriculum and the current teacher education curriculum. In the former curriculum we observe less of environmental contents and themes as compared to the latter.

(Memo-From the interview it is claimed that currently in the teacher preparation process there is awareness and concern about the mainstreaming environmental contents and issues.)

**Interviewer probing:** is not teacher education curriculum an intended (planned) how to related to the integration practice?

**Interviewee:** through standards or competencies identified and set for teachers (subject matter, pedagogic content competencies) both the planned and the practice aspects of the training will be given due attention currently.

**Interviewee:** 2. How do you see the primary school teacher competencies in teaching environmentally integrated subjects?

**Interviewee:** the availability of environmental clubs, preparation of environment related supplementary materials may manifest the emphasis given to the environment at schools. Thus developing students' awareness and skills can be achieved through the contribution of extracurricular activities in addition to content teaching in the hosting subject.

Memo-However, the interview could not justify the availability of those effort and their effects as well as what the competencies of primary school teachers look like in teaching environmental components in their subject matter.

**(RE01-Lungo)**

**Interviewer: 1. How do the tem environment, environmental contents and issues and Sustainability, concern are understood?**

**Interviewee:** language curriculum is prepared at national level but the region adapts through the addition of some examples and questions. English curriculum development can be said centralized. But Amharic Afan Oromo and others characterize variations even in the region itself, this is because the experiences, habit and customs are not uniform throughout.

Generally as principle concretizing and incorporating what students learn from their surroundings is emphasized in elementary education notably in lower primary school. However, there are challenges in making the language curriculum of primary school relevant and relating to the children's environment say in basic education because of the diverse dialects and customs prevailing within the region. Irrespective of the challenge, in the lower primary school education effort is made to relate learning to students' environment, applying the principle of moving from near to, far, known to unknown...etc. In such way the continuity of the knowledge structuring is supported in language area of learning of the children.

Then the concept of environment for me is Geographical idea that refers to where (place) learners live, or in Afan Oromo it may mean "naannoon iddoo baratootni jiratanu dha".

The integration of environmental contents and issues in primary school language textbooks encounters problems among which difference in dialects and meaning given to different environmental element/items local language such as Afan Oromo. Because of English language curriculum preparation approach relating to students' experience (localizing) in English teaching is problematic. The English textbook of primary school is prepared in such a way that all children are taught in similar way irrespective of geographical and cultural differences- no room for adaptation. Pertaining to the concern of environment sustainability, I believe that sustainability is considered in different level in the language curriculum of the primary school. For example in Afan Oromo environmental concern and sustainability appear fairly reflected in the textbook. These can be noted from the values, history, natural resource; health care etc related topics duly covered in the primary school Afan Oromo text books.

Memo-From the interview discussion we also learned that while maintaining the national fame works (standard) in the process of adapting to the region ' ' reflecting the regional reality as desired is problematic; this is why the curriculum revision is relatively so frequent. The implied message related to the incorporating regional (local) environmental reality challenges are perhaps attributable to the national level educational goals and core contents maintaining requirement and the prevalence of wide experience and customs even within the regions. Consequently, the space available to main stream or structure the local knowledge or experience into the primary school language text book is impeded.

**Interviewer: 2. How is integration of EE contents and issues into all primary school subjects perceived?**

**Interviewee:** integrating environmental issues into all subjects is theoretically well recognized, practically integration effort is there but due to capacity and cost, integrating EE contents and local experience does not seem as effective as intended. Yet, in Afan Oromo textbook the incorporation of environment contents and issues appear adequately covered in the 1-4 grade level as compared to 5-8 levels. In Oromian context, the reason behind making students learning environmental or relevant to their real life is to make learning understandable, through the use of immediate examples and contents.

Memo-From the extended discussion with the interviewee it is apparent that employing environmental (local) experience is helpful for the children learning, and attract them to word education , foster students interest, and help making meaning of their own.

**Interviewer: 3. To what extent environmental topics and issues are integrated into primary school subjects?**

**Interviewee:** To respond to this question, it is important to remember that currently primary school curriculum (syllabus) is prepared federal level; and regional states translate to their local language. This process involves flow chart developing and from flow chart syllabus is prepared from which textbook and teacher guide are created. In other word, based on the central standards regional states prepare their own adapted curriculum. In this sense it can be considered that the language (e.g Afan Oromo) syllabus incorporated environmental components relatively to a considerable extent but cannot be free of limitation. Specifically the challenge related to the effort of making the language standardized (*Walteessuu*). For example an object or item may have several names within the region, and to smoothen such problems in language curriculum panel there is an emerging effort to introduce supplementary teaching materials. Pertaining to the criteria used for integrating environmental theme into language textbook of the primary school, I don't see clear criteria specified but, what I can affirm is that the curriculum is constructed by experienced professionals and different stakeholders and experts are involved and reviewed it. **Interviewer: 4. How do you explain whether there is a conscious effort to integrate EE**

**contents and issues into primary schools subjects?**

**Interviewee:** textbook writers will be trained and oriented and editors of higher level involve in the process of textbook writing. After wards the task force formed and cross account the text book written against the check list set in advance.

**Interviewer: 5. How do you judge about the implementation of integration of environmental contents into Afan Oromo text book of primary school, and extent of considering the local experience?**

**Interviewee:** I would claim that there is not felt problem in the case of Afan Oromo related to the incorporation of environmental contents and issues, because the teachers are well oriented as compared to other language subjects.

Furthermore, gradual--- model is introduced in the teacher education specifically in language area, unlike other subjects. Primary teacher training also induced pedagogic content knowledge (PCK) starting from 2015, where it is believed to contribute to the implementation environmentally integrated subject of the primary school.

**Interviewer: 6. How do you explain the competence of primary school teachers in teaching environmental contents and issues integrated into their subjects?**

**Interviewee:** currently the complain coming from students and parents about the teaching-learning outcome suggests the existence of certain problem related to teaching competence of teachers. In this case it seems there is difference between the relatively experienced teachers and recently trained (inexperienced) teachers where the former tend to perform better.

Memo-The tacit meaning implied in this discussion may represent the fact that illuminate the prevalence of limitation in teachers' professional readiness to apply innovative teaching models

**Interviewer: 7. What can be said about the quality of the primary school textbook writing in the context of integrating environmental contents and issues?**

**Interviewee:** the primary school textbook is not without problem. For example the large information coverage in language subjects textbook criticized for being overcrowded. Yet, with all the challenges encountering the mother

tongue-Afan Oromo language (in Oromia) textbook appear better in maintaining relevance and relatively making meaningful to the students' learning.

Memo-Even though, understanding coming from the interview conversation shows the existence of opportunity to address the need and interest as well as problems of the learner, there appears making learning environmentally responsive or teaching the contents and issues integrated from environmental components into their subject Afan Oromo textbook is problematic.

**Interviewer: 7+. How are students supported in learning the environmental components integrated into other subjects?**

**Interviewee:** well, though not uniform, approach employed to incorporate EE components into language subjects at primary school is believed to support student learning. However, knowledge/information tends to be more focused than skill both in the textbook and instructional processes because there are no much engaging strategies structured from the outset and content telling (information) predominates while practicing activities, dramatize role playing observing and reporting are scantily planned and apparently such approaches are challenging (constraints) to children learning.

**Interviewer: 8. What do you suggest for further improvement EE contents and issues to integrated into all primary school subject textbooks?**

**Interviewee:** I like to forward the following points related to the integration of environmental contents and issues into language subject textbook of the primary school.

- 1) The presently centrally prepared English language curriculum without adaptation shall open room for regions to adapt to their real context. Particularly at lower primary (basic education), more emphasis should be given to relevance, making learning locally friendly, and more of locally responsive.
- 2) To make environmental theme more inclusive into other subjects including language area, in the process of subject matter content structuring, it is recommendable to involve professionals from different zones (localities) of the region.
- 3) It is also recommendable to give orientation and relevant training on the process of curriculum implementation to the first line stakeholders.

Working on the alignment of the teacher education and primary school curriculum subject contents.

Maths (RM02)

**Interviewer: 1. How concepts of environment, environmental contents and issues, sustainability issues are understood in other subjects?**

**Interviewee:** the curriculum (syllabus) is prepared at the center by ministry of education where regional states translate and adapt into their local languages. While adapting to their condition regions incorporate experiences and examples from their environments, depending the subject matter nature.

Hence, environmental examples are included only to supplement mathematical learning but not as main content. For instance rivers can be used as a reference to calculate length, volume etc. Likewise, sustainability issue does not seem the main issue in mathematic due to the subject matter nature. For students living in different settings such as urban, rural, pastoral etc, examples are used to make contents relevant to their context.

**Interviewer: 2 How do you perceive the integration of EE contents and issues into all primary school subjects?**

**Interviewer:** it not integrated in required level. I don't think incorporating EE contents and issues in mathematics subject is feasible, even if tried it is challenging due to the discipline's specific attribute for it focuses mainly on problem solving.

**Interviewer: 3. To what extent environmental contents and issues are integrated into mathematic text book of the primary school.**

**Interviewee:** the integration is not adequate except serving as supplementary means in the form of examples or questions.

**Interviewer: 4. What is your observation whether there is a conscious effort to integrate environmental education contents and issues in this case mathematics.**

**Interviewee:** during curriculum development the concerned bodies are invited to involve in the need assessment to realize the relevance of the subject contents to the region as much as possible. Hence, in the context of mathematics, this attempt is believed to create opportunity to incorporate some examples and problems from the environment. Awareness of expert (particularly in mathematic area), about the importance of the integration of EE contents and issues into all primary school is problematic; different subjects experts often focus on their subject matter and lacks information about EE intent and content. No special framework available to be used while preparing mathematics primary school text at regional level. To be honest, during curriculum design and textbook writing no serious concern checking the educational and training policy directives.

**Memo-**The implication of the interview discussion shows that the mathematics subject nature together with experts' unawareness and less regard prevailed about the importance of EE contents and issues negatively affect the integration EE components into mathematics subject of primary school.

**Interviewer: 5. What is your view toward the implementation of integrated EE contents into mathematic and integration of local experience ?**

**Interviewee:** at implementation level there are not indicators of effective implementation of environmentally integrated subjects including mathematics at primary school. The main stream environmental education contents and local experience / knowledge/ incorporation into other subject is problematic. The characteristics of the subject matter and less suitability of environmental contents and issue to mathematics are factors.

**Interviewer: 6. How much Primary school teachers' demonstrate competences in teaching EE contents in their subjects?**

**Interviewee:** as a subject experts my main role is curriculum designing where the focus is developing the material according to the international and national standard, I never involved in monitoring the teaching-learning activities of school level. I lack evidence about teachers' competences of teaching environmental contents in mathematic subject

**Memo-** It seems apparent from the internet conversation then, there are not opportunities for teacher to be oriented or get feedback on how and connotation of curricular materials for effective implementation particularly the integrated subjects like this? Orientation about the purpose and core orientation about the purpose and core comments included in the curriculum and how to implement it. The experts of mathematics at region tend to lack information about urgency of incorporating environmental contents and issues into the primary school (mathematics subject. The perspective held by such participant toward the importance of integrating EE contents into mathematics minimal. As interpreted from the ideas of the interview the reason raised not much bothered about the incorporation of environmental components into mathematics is that the subjects carrying capacity and relevance to environmental contents and issues is basically different from other subjects and found to below.

**Interviewer: 7. How is the quality of primary school textbook including mathematics textbook writing?**

**Interviewee:** currently the process of curriculum development of primary school involve, first designed by federal education minister funded by world bank, and then the regional state are allowed to translate to their local language by subject experts selected at national level and adapted to the regional context. In this case there is the effort of incorporating examples and issues reflecting the available experiences and attributes of the regional environmental realities depending on their relevant to the subject matter. But in the previous times the Oromia education bureau was in charge of preparing the subject textbook. The role of the regional curriculum and subjects experts now engage in the reviewing and evaluation of the written textbooks for the final say. As much as possible there has been effort to maintain the quality of the textbook but is very difficult to expect limitation free curricular material development.

**Interviewer: 8. What suggestion could be forwarded for further improvement of the integration of EE content and issues into primary school subjects?**

**Interviewee:** related to the integration of EE contents into the primary school subjects including mathematic the following must be considered:

- Preparing independent textbook for pastoralists children according their unique experience

- Making continuous refreshment and orientation on the curricular materials introduced such as environmentally integrated subjects implementation. so that the key stake holder understand the goal and direction for their policies in terms of different subject matter nature.

### **Biology(RB03)**

**Interviewer: 1. how do the concepts of environment environmental contents and sustainability issues understood in the context of different primary school subjects?**

**Interviewee:** In 1-4 the environmental components are more emphasized and integrated by drawing themes from different subject area as environmental science. For 5 and 6 it is organized as integrated science where environmental contents and issues are addressed but tend to be dominated by content areas from biology. Hence, in 1-6 the integration of EE contents in science appear continuous but the depth and breadth differ that is decreases from complete integration notion (environmental science) to less integrated (integrated science); but at 7 and 8 the subject structure become linear or discipline base design where it divided into social science (e.g. social studies and natural science (e.g. physic, chemistry biology) standing alone.

In this case the concept environment does not have any precise definition. But the subjects' relevance to the student and their environment is given attention as textbooks are prepared contents wise, biology subject covers more of environmental contents and concerns, living things for instance are among the emphasized theme.

As illuminated from the discussion sustainability is reflected in science subjects of the primary school particularly biology because education and training policy and K-12-curriculum frame work urge us to integrate all the cross cutting issues into all primary school subjects. Take instance of inclusion of contents such as conservation of endemic animals' social conservation, rehabilitation and the degraded lands. Through co-curricular activities awareness, care and protection for the environment are among the attention to be given.

**Interviewer: 2. What is the prevailing views towards the Integration of EE contents and issues into all primary school subjects related**

**Interviewee:** translation of policy intentions into educational practice is believed to be in effective to the desired level. Yet the integration of EE contents and issues into all primary school science subjects relatively appear better integrated, but not at equal floating.

**Interviewer: 3. To what extent EE contents and issues, are integrated into all primary school subjects ?**

**Interviewee:** ok, the magnitude (scope ) of integration of environmental contents and issues is determined according the minimum learning competence set. The curriculum development approaches involve developing flowchart— syllabus, teacher guide, and textbook preparation, but there is not special criteria to follow.

**Interviewer: 4. What is your observation** where there is conscious effort to integrate EE contents and issues into all primary school subjects.

**Interviewee:** in science area of the primary school subject, there is clear interest and endeavors to cover the environmental contents and issues into other primary school subjects positively.

**Interviewer: 5. What is your observation of implementation of EE contents and issues integrated into all primary school textbook and related to local experience?**

**Interviewee:** For me incorporating EE contents and issues and local experience into the science subjects of the primary school appear adequate. Thus, the issues and themes of both science area subjects and EE raises and deal with overlapping and science subjects have wide options to carry environmental components.

But there is limited attempts to include local experience or indigenous knowledge related to environment where the community members are believed to have a rich experience and knowledge about diversities of natural resources and the way of carrying or protecting them. For example farmers and elders in rural areas know the difference between indigenous trees and non indigenous, local trees such as Waddessa (Wanza) Birbirsa (Zigiba) Tikur Inche (Oonii) , Qilxuu(Warka) Kerrero etc. last long about 500 years as compared to trees originated outside of the country like Eucalyptus tree, Tid, etc. which never stay more than 50 years maximum.

Memo-Thus by implication planting and conserving the indigenous major tree forest means a lot from the environmental literacy, care and protection point of view. According to the participant our farmers have a good deal of environmental experience but it does not seem level considered in our curriculum to the desired to make the local experience of the over community rational and scientific formal education is needed and should integrate the indigenous knowledge.

**Interviewer: 6. For you what is the level of teachers competence to teach environmental contents and issues in their subject?.**

**Interviewee:** ho, in any case currently making the teaching learning process interactive and engaging is needed, but making the learning environmental and locally responsive is not as expected due to reasons such as teacher related problems, students' large size, allocation of mismatch period to the scope of the subject. Beside, there is a felt need to orient teachers on curriculum implementation. Absence of orientation or training on curriculum has negative impact on teachers' preparedness to implement the curriculum in general and environmentally integrated subjects. In the context of biology or science curriculum, problems are clearly sensible in handling environmental contents in their subjects.

Memo-He also explicated that, currently the training or preparation of teacher education appears better. However, this seems contradictory to the idea of the application of interactive and locally responsive approach of teaching-learning process, hence, suggesting it is not as effective as expected.

**Interviewer: 7. What is your comment on the process and quality of primary school textbook writing? Please tell me about the process and quality of primary school textbook writing**

**Interviewee:** the textbooks are prepared at center by subject experts who are hired based on international bid, and later translated to mother tongue language of students incorporating experiences and examples from the region.

Memo-The teaching approach focuses on knowledge imparting but developing skill or competence seems lagging behind as the interview remarked.

**Interviewer: 8. For further improvement of integration of environmental contents and issues into all the primary school subjects what can be done? Give me suggestions.**

**Interviewee:** I suggest fostering competence-based (skill-focused) learning, involving all the concerning stake holders such as elders, parents, community, students, teachers, educators, etc in the process of curriculum making and implementation and continuously consulting these bodies for their experience, need and concerns.

**(RG04)**

**Interviewer: 1. How do concepts of environment, environmental contents and issues, sustainability conceive in your subject area? Share me your idea on this please**

**Interviewee:** Ok, the environmental contents are well incorporated in 1-4 grade levels. Environmental learning is made possible in environment science, where the students surroundings are the main focus-specifically physical, biological and socio-cultural issues are all integrated. For 5-8 grade levels environmental contents are incorporated to the related topics in other subjects. I could say, currently, environmental components are incorporated into social studies specially geography in a required level. Natural resources, biological aspects including humans all are interdependent, humans particularly utilize their bio-physical environment to survive and further improve their way of life in on going manner. Thus, attempts have been made to incorporate the environmental contents and issues in social study of primary school.

**Interviewer: 2. How do you see the integration of EE contents and issues into primary school subjects?**

**Interviewee:** that environmental contents and issues are well considered and covered in primary school subjects at a vary magnitude but adequately integrated into biology and geography subjects, which share common themes in most cases.

**Interviewer: 3. To what extent EE contents and issues are integrated into all primary school subject's scope and criteria considered? Please tell me your view on this-**

**Interviewee:** well, the integration of environmental contents and issues appear adequate for 1-4 as compared to 5-8 grade levels. The curriculum development process follows building content areas layer by layer in harmonized ways. This involves sketching flow chart, developing syllabus maintaining integration vertically and horizontally while organizing the curriculum contents and writing textbook based on the syllabus. Then I suppose, environmental components are incorporated into all subjects of 1-4 and 5-8 grade levels differently as integrated and linear form respectively yet the continuity of topics or content areas will be maintained as much as possible.

**Interviewer: 4. How do you comment on whether there is conscious effort to integrate EE contents into all primary school subjects?**

**Interviewee:** yes there is conscious effort to include environmental components into primary school subjects because it is policy induced where the environmental issues are stipulated in the policy action plans as one of cross-cutting components. Specially at planning stage there is deliberate effort to incorporate environmental elements into primary school subjects including social studies. But the question may be asked about the effectiveness of the implementation. To

**Interviewer probing question:** your observation on the experts' awareness about the integration of EE contents into other subjects?

, **Interviewee:** good, for those involved in the curriculum development is subject specialists' integration of important components like that of environment are expected to be considered.

Related to this the investigator (i) noted that, the expired curriculum and subjects experts are not stable, for instance the biology and geography curriculum experts who have more than two decade at the BBO are being transferred just before this interview conversation taking place.

**Interviewer: 5. What is the practice of integration of EE contents and local experience into all primary school subjects? Please share me you observation,**

**Interviewee:** there is some effort to incorporate environmental contents and issues into primary schools. The environmental components are well addressed in social study subjects of the primary school. I understand importance of integrating local experience about the environment into school subjects, because the members of the local community know more about some issues of the environment even than the educated persons but in practice the local or indigenous experience (knowledge) integration into the primary school subjects is neglected.

**Interviewer: 6. how do the primary school teachers demonstrate the competence to teach environmentally integrated into primary school subjects?**

**Interviewee:** I lacks evidence about teacher's competence to handle environmental contents main streamed in others but it is hoped that teacher are prepared in their respective subject matter areas. As why the expert lacks evidence as mentioned earlier, as implied the discussion detail is because of absence of supervision particular lesson observation at primary schools.

**Interviewee: 7. How do you judge quality of the primary school textbook writing in the context of integrating of EE contents and issues**

**Interviewee:** the extent of incorporation of environmental components into other primary school subjects differs by subjects and grade level. I think, currently related to social studies textbook there is no serious problem, but detail examination must be made to identify the real status.

**Interviewer: What can be suggested for more improvement of integration of environmental contents and issues into primary school subjects?**

**Interviewee:** I recommend continuous curriculum revision based on stakeholders need; maintaining alignment of education policy and curriculum frame work. Teachers training process should also consider the mainstreaming environmental contents and issues.

**II. Primary School Teachers' Interview Transcript**

**DedAO27f-1**

1. **Question:** What is the concept of environment?  
**Answer:** “meeshaleen adda adda kan irraa hojjetamu”. It is used as source of different teaching aids in maths instruction
2. **Question:** What is your view toward EE content integration into primary school subjects?  
**Answer:** environmental elements have to be considered into primary school subjects because it can support mathematical concept learning. Wantoota adda addaa kan akka lakkoofsaa hojjechuun barattoonni irraa baratu. Different things such models for counting number can be made from environmental materials. Otherwise, I don't know the need of including environmental elements in mathematics subject.
3. **Question:** To what extent EE components are integrated into primary sch. subjects?  
**Answer:** For me there are fewer contents available in mathematics due to the subject matter nature. *timhirtu aygabizim*. The subject does not suit or invite environment related contents and issues
4. **Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?  
**Answer:** Memihiru temarihun lemasredat lemaschbet yemayaregew yelem. Teachers attempt to clarify and elaborate lesson topics as much as they can. We prepare and use materials from wood paper etc as aid to make the lesson understandable.
5. **Question:** How do primary school teachers relate EE to local experience and real life?  
**Answer:** It is not effective due to the students' low interest and parents' loose support. School and teachers strive to involve community to participate in school affair but not successful.
6. **Question:** How do primary school teachers demonstrate competencies in teaching EE contents in their subjects?  
**Answer:** Competences in their subject are medium perhaps due to lack of orientation on the curriculum in general and environment related issues in particular. The recently given training on A/Oromo was helpful for teachers empowerment methodologically.
7. **Question:** What opportunities are available for students to learn EE contents?  
**Answer:** Students will be benefited when resources are used as teaching aid. Fakkeenyaaf yeenchet fire... hind merja mesariya metekem. For example using wood, grains of plants etc.
8. **Question:** How do you judge the quality of primary school textbook in terms of EE component integration?  
**Answer:** The presently, primary sch. textbook seems good regarding inclusion of activities, but the time allotted does not match the engagement desired in activities and to individualize students. This is further exacerbated by large students' size in the classroom.

**DedNsc12f-2**

1. **Question:** What are the concept of environment, environmental sustainability?  
**Answer:** Naannoo : wantoota uumamaa, lubbuu qabeeyyii fi lub buu dhabeeyyii fi nam-tolchee fa'i. Kan kunuunfamuu qabuudha. Environment refers to natural things- living and non living elements as well as man made.
2. **Question:** what is your view toward EE content integration in primary school subjects?  
**Answer:** Hammatamuun isaa barbaachiisaadha. Sababiinsaa barnoota qabatamaaf hubatamaa

waan tasiisuuf. Waan beekanuu fi salphaa irraa ka'uun baratanu fedhiin hirmaatu, hubaatus. Baachoo, fakkeenya naannoo hubannoof bu'uuraa yaammu ta'uu bakka kun hin taanetti barnootni barattootati abjjuu ta'u danda'a. Integration of EE contents into other subject is acceptable because it makes learning clear and meaningful besides starting the lesson from what is known and simple reinforce interest as well as effort of learning. In this case employing examples from the environment concretize concept learning otherwise it becomes illusion to pupils

3. **Question:** To what extent EE components are integrated into primary sch. Subjects, (Scope of coverage of EE contents)?

**Answer:** The environmental science subject incorporates environmental contents and issues adequately.

4. **Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?

**Answer:** yes there is conscious effort to integrate environmental components into environmental science as example. There are visible environmental elements such as plants in it

5. **Question:** How do primary school teachers relate EE to local experience and real life?

**Answer:** There is a limited attempt (e.g. field but not much). Using indigenous knowledge experience appear non-existent

6. **Question:** How do primary school teachers demonstrate competencies in teaching EE contents in their subjects?

**Answer:** Qabiyyee naannoo barsiisu irratti rakkoon hinjiruu; garuu adda addummaan looqodaa dhibbaa hikaa fiduu danda'a. I think, there is no problem in handling the available environmental contents but variation of terms and issues meaning among may cause certain limitation

7. **Question:** What opportunities are available for students to learn EE contents and issues?

**Answer:** classroom learning and involvement in clubs are instances of the opportunity.

Fakkeenyaaf gummiwwan akka kunuunsa naannooti hirmmaachuu fa'i. For example students participate in environmental conservation club

8. **Question:** How do you judge the quality of primary school textbook in terms of EE

component integration?

**Answer:** I could say it is good but some contents of the environmental science difficulty

level appear beyond the children's ability, say grade two textbook

### **Dedph15f-3**

1. **Question:** What are the concepts of environment, environmental sustainability?

**Answer:** Naannoon wantootaa jireenyaa barattoota wajjin walqabataa ta'ee iddoo jireenyaa guyya guyyaa ijoolleen kan walqabatuu. Environment is related to things needed by student and concerns place of where they live.

2. **Question:** What is your View toward EE content integration in primary school subjects?.

**Answer:** It is important. Ni barbaachisaa, sababinis barnoota naannoon walqabisuun hubatama, haala salphaan akka galuuf hojii irraa oolufi. Integrating EE into primary school subject is important since linking teaching-learning process to the the environment makes learning easily understandable.

3. **Question:** To what extent EE components are integrated into language subject of the primary school?

**Answer:** Afaan Oromoo keessaa qabiyyeen naannoo amma tokko jira. Kitaabni hara'a gaarrii ta'u wajjin leenjiins kennameera. Afaan jireenyaa naannoo barattootaa walqabisiisuu mataduree dubbisaa keessatti hammatame jira, garuu akka ijooti dandeetti afaanii ciimsuu irratti waan xiyyeefatuuf qabiyyee naannoo barsiisuuf yeroon addaa hinjiru. Afaan Oromo textbooks incorporate

EE components to some extent; this is supplemented by improvement of the textbook and associated trainings. There have been issues infused from the environment in the passages but intended to clarify language skills. English textbook of primary school manifests some problems in its preparation and contents it is being exposed to changes, lacks clarity, teacher's guide mismatch with textbook. Moreover, some topics are absent and some be beyond the capacity of primary (lower) students; particularly, do not seem suit rural children. "Qabiyyeewwaan dandeetti barattootaa olii ta'an diyyaatani barattoota baadiyaatiif kan mijaa'u hinfakkatuu.

4. **Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?

**Answer:** There could be teachers who strive to handle all contents including EE components but all are not equally concerned and committed. This is because process and support and monitoring system appear limiting factors. For example, lack of staff training, support systems are noticed at schools.

5. **Question:** How do primary school teachers relate EE to local experience and real life in the context of teaching environmentally integrated primary school subjects?

**Answer:** Sochiin jiru gaariidha, qabiyyeen muuxannoo jireenya kitaaba keessa jira ni xiqqata malee.

Kanaa wajjin muuxannoo naanno o dabaluun ballisuun gama mana barumasa fi barsiisota ni hafa. The current effort is ok; the local experience included into the textbook is meager at the same time the attempt of relating to the local experience at school level by teachers is negligible.

6. **Question:** How do primary school teachers demonstrate competencies to teach EE contents in their subjects ?

**Answer:** Akka kooti marii wliiniin (one to five) haallii barsiisuu fooyessuf sochiin jira ga'aa hinta'in malee. Barannoon daree (mana barumsaa) alaa haalan hinjiru. I think the small group discussion (one-five) under operation somehow contributes to the improvement of students learning but seem less effective. There is no much out of classroom or school learning chances.

7. **Question:** What opportunities do primary sch. students have to learn environmental education contents?

**Answer:** The opportunity available may include classroom learning activities. Biqiltoota dhaabuu fi kunsuun, gummiiwwan kan akka kunuusuu naannoo irratti hirmaachuun fa'in baratu. Cultivating plants and conserving and involving in extra curricular activities like environmental protection club they can experience

8. **Question:** How do you judge the quality of primary school textbook in terms of EE component integration?

**Answer:** The organization of contents and activities seem ok, though not free of errors. Font size error, voluminous size and problem of durability of the textbook are instance of the problem.

#### Dedph8f-4

1. **Question:** What are the concepts of environment, environmental sustainability?

**Answer:** Naannoon waantoota lubbuu qabeeyyii fi lubbuu dhabeeyyi hammata, hawaasa amala adda addaa qabanuus ni dabalaa. Environment comprises living thing and nonliving as well as communities of diverse characteristics.

2. **Question:** What is your view toward EE content integration in primary school subjects?

**Answer:** Hammatamuun isaan barbaachiisaadha, garuu qabiyyeen tokko tokkoo barsiisuunf hojiirraolchuun rakkisaadha. Integration of EE into all primary school subject is important though teaching some contents appear changing. In science, some contents appear abstract perhaps because of absence of lab experiments or activities. Fakkeenyaaf, waa'ee xannachaa (gland) dhiyaate uulfataadha. The content termed *xannachaa*-gland for grade 4 seems difficult. There are mis- match of difficulty level of contents and students' ability as noted in 4<sup>th</sup> grade. The organization of content is not logically structured moving from easier to the difficult and made understandable by relating to the environment.

3. **Question:** To what extent EE contents and issues are integrated into primary school subjects?  
**Answer:** Akka qabiyyeetti kan naannoo ilaalu jira haa ta,u malee qabatamaa fi ga'aa ta'u irratti shakkiin jira. Environment related contents are there in the subjects but in making environmental issues meaningful appear problematic
4. **Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?  
**Answer:** There is some effort to integrate environmental contents into other primary subjects. For example, planting trees or others in the school compound, practicing and learning by doing are among the efforts made.
5. **Question:** How do primary school teachers relate EE to local experience and real life in context of teaching environmentally integrated primary school subjects?  
**Answer:** Kunneen kitaaba barataa keessatti xinnoo xinnoo tuqamaadha. Gamaa mana barumsaan muuxannoo ambalee-aadaa kkf tiif, adeemsa baruu keessatti amma xinnoo tokkoo ilaalicha keennuu ni yaalama. Local experience and real life instances are rarely infused in textbook, similarly at school and teaching-learning level issues of cultural heritage will be considered to a limited extent.
6. **Question:** How do primary school teachers demonstrate competencies to teach environmentally integrated subjects?  
**Answer:** According to my experience science teachers try to enrich teaching-learning and also employ out laboratory activities.
7. **Question:** What opportunities are available for primary school students to learn environmental components?  
**Answer:** Here in addition to classroom teaching, we use school based materials for example plants to teach science subjects
8. **Question:** How do you judge the quality of primary school textbook in terms of EE component integration?  
**Answer:** regarding the quality of primary school textbook, generally I could say the textbook quality in science area is ok. Qabiyyee fi gachaaleen gariidhaa. Contents and activities designed are well sequenced. However, some details of the content lack conclusiveness or summary.

#### DedAO11m-5

1. **Question:** What are the concepts of environment, environmental sustainability?  
**Answer:** Naannoon barattoonni afaan isaanin barachuun barnoota hubatamaa Taasiisa waan ta'eef haala naannoon walqabsiisuun Afaan keessatti ni egama. Environment related lesson (in language) makes learning understandable hence expected to be emphasized in language.
2. **Question:** What is your view toward EE content integration in primary school subjects?  
**Answer:** The integration of environmental contents and issues into school subject is desirable for it promotes learners understanding about their environment and resources such as air, soil, plants as well as the conservation methods. Teachers have awareness about the importance of environment.
3. **Question:** To what extent EE contents and issues are integrated into primary school subjects?  
**Answer:** Kana irratti, ammii tokko jira jeechu n ni danda'ama. Fakkeenyaaf, kutaa 8ffaa keessatti boqqonnaan tokko waa'ee naannootti. Mata dure qonnaa, biyyoo, biqqiloota dhiyaataniru, garuu, ga'aa mit. In this regard we can say there are limited EE contents. For example, in 8<sup>th</sup> grade Afan Oromo textbook one chapter addresses environmental issues with topics farming, soil, plants but this is not enough.
4. **Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?  
**Answer:** Gamaa kanaan kallattiin carraqqii jira, kana caalaa ballinni fi gadii fageenyii osoo dhiyaate gaariidha ta.a. There is right direction and effort to integrated EE into primary school subjects including Afan Oromo, but the breadth and depth of contents consideration need be improved
5. **Question:** How do primary school teachers relate EE to local experience and real life in

context of teaching environmentally integrated primary school subjects?

**Answer:** There is certain effort to relate teaching to immediate experience. For example students are guided to involve in planting trees, environmental conservation; however, there is no considerable Indigenous experience in the textbook understudy. Though, curriculum incorporates little or no community experience pertinent to the care and protection of the environment, there is room for teachers to assist students to learn from local experience.

**6. Question:** How do primary school teachers demonstrate competencies to teach environmentally integrated subjects?

**Answer:** Kana ilaalchise, sadarkaan barumsa barsiisotaa hundii diplooma fi heddunis digrii waan qabanuf qabiyyee naannoo barsiisuuf hin rakkatanu. As teachers' educational level is improved to diploma and beyond they can handle EE contents in their subjects. Theoretically teachers are prepared, but practical application may be problematic.

**7. Question:** What opportunities are available for primary school students to learn environmental components?

**Answer:** Ija Afaaniin carraa jiru dhiphoo fakkataa, innis mata duree murasaa kitaaba irraaf hojii daree irraa gofaadha; kara bira gummiwwan akka kunuunsaa naannoo fi qonnaa fa jiru. In Afan Oromo context the opportunity available seems narrow, it is restricted to a few content from textbook and classroom experience as well as from involvement in clubs like environmental conservation and agriculture.

**8. Question:** How do you judge the quality of primary school textbook in terms of EE component integration?

**Answer:** Inni kun gaarii dha jeechun ni danda'ama. Garuu anqinnis jira, gochaaleen, fi projeektii foyyeefamuu qaba. The primary school subject textbook quality can be said well. Yet learning activities and project type and size need be improved

#### Gema5m-6

**1. Question:** What are the concepts of environment, environmental sustainability?

**Answer:** Environment or naannoon herrega keessatti wantoota naannoo quyyabotaa hubachiisuuf gargaaraanudha. Akka deeggarsaa meeshaati malee qabiyyee ijoo ta'e mit. Related to mathematic environment includes things of the surrounding that can be used to supplement mathematics calculation, thus the environmental contents only used as learning aids.

**2. Question:** What is your view toward EE content integration in primary school subjects?. **Answer:** Herreegaa keessatti qabiyyee naannoo dhimma ijoo ta'u hin danda'u akka meeshaa

deggarsaa malee. In maths environment related components are not treated as main contents but as media.

**3. Question:** To what extent EE contents and issues are integrated into primary school subjects?

**Answer:** Wantootni naannoo akka fakkeenya fi deggarsaa tti hammatamuu iyyuu innu xiqqoodha. The environmental elements used as examples and media are also scant

**4. Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?

**Answer:** Goosa barnoota hundaa keessatti Kallatti sirrii fi hubannoo irratti hunda'adh jechuun rakkissadh. It is difficult to conclude that EE contents and issues are consciously integrated into all primary school subjects.

**5. Question:** How do primary school teachers relate EE to local experience and real life in context of teaching environmentally integrated primary school subjects?

**Answer:** Naannoon akka madda meshaalee degarsaatti fayyadamu fi xiqqoo hojii irraa jira. Environment is often used as source of teaching aids, but not as desi red

**6. Question:** How do primary school teachers demonstrate competencies to teach environmentally integrated subjects?

**Answer:** Carraqqiin barsiison qabiyyee naannoo barsiisuuf taasisanu sababaa gargaruumaa hubannoo gutuu mit, amma eegamuu mit. Barsiisonni dhiimmaa naannoo irraatt odeeffannoo fi leenjii dhabuu, barattoota xiyyeeffannoon lafuu. The commitment of teachers to teach EE components in their subject is low due to difference of awareness, lack of information and

orientation pertinent to environment. Less focus accorded to education by students also appears additional impediment.

- 7. Question:** What opportunities are available for primary school students to learn environmental components?

**Answer:** Carraa qabiyyee naannoo barachuuf gummiwwan kan akka kunuunsa naannoo, mini media kkf. Jiru haa ta'uu malee ga'a mit. Clubs like environmental conservation and mini-media can cited as the opportunities though not sufficient.

- 8. Question:** How do you judge the quality of primary school textbook in terms of EE component integration?

**Answer:** Gama kanaan hanqinni jira. Fakkeenyaaf qabiyyeen herreega kutaa 4ffaa baayyee Cimmaadha. The textbook specifically maths is not without problem, for example the 4<sup>th</sup> grade maths contains difficult content areas.

#### GeBio34m-7

- 1. Question:** What are the concepts of environment, environmental sustainability?

**Answer:** Wantootaa naannoo keessa jiranu. Kunuunsi, Afaan keessatti biqiltoota beeladotaa fa'a ilaalchiise jira. Environment may be understood as things it contains. Contents wise conservation of vegetation and animals are incorporated into Afan Oromo subject.

- 2. Question:** What is your view toward EE content integration in primary school subjects?. **Answer:** Akabaabin yemmeleketu yizetoch mekaatet melkaam naw. Alemekatetu gojii naw, haala naannoo irratti hunda'uun yoo hinbarannee rakkoodha. The integration of EE contents into other subject is acceptable and disregarding it is harmful. The learning process that divorced of the environment becomes problematic.

- 3. Question:** To what extent EE contents and issues are integrated into primary school subjects?

**Answer:** Indeene, ke gimash belay ye akabaabi hunetalay ye temesereta naw. Fkn. Saayinsii, Afaan. For me there are more of environment content and issues in primary school subjects for example in science and language.

- 4. Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?

**Answer:** Be memhiran mekakil balew ye ginzabe liynet Engiliizinyaa mastemar lay bizuowch yichegeralu.. Barsiisota muuxannoo qabanu isaan lemasitemarm endihu naw. In language context textbook is ok, but to pursue teaching effectively, teacher's personal growth is required. Owing to the difference teachers have in English language ability most restrain from handling it.

- 5. Question:** How do primary school teachers relate EE to local experience and real life in context of teaching environmentally integrated primary school subjects?

**Answer:** Ahun yalaw tihimret ke akababi gar ye teyaaze hono, ke hibretesebu ya kababi yizet

(environmental content issues) limdi yibelxii bikaateti. Currently most of the educational programs incorporate EE yet it is recommendable to consider environment related experience from locality. The experienced teachers (kan qabanuu isaani hin qabinne caalaa fayyadamoodha) appear better in linking lesson with local experience. In some subjects (e.g. language, science) local experience related to conservation and handmade activities are covered though not adequate enough.

- 6. Question:** How do primary school teachers demonstrate competencies to teach environmentallyintegrated subjects?

**Answer:** Teachers often differ in their understanding about different conceptual issues that

may include EE. Experienced teachers are prepared (better) than less experienced ones. They tend to be better in capacity and concern, and responsibility assuming. Ye raas amelekaketi muyawun

amino megibat chigirfetiro yihon. Personal outlook and view toward the teaching profession may be a factor.

- 7. Question:** What opportunities are available for primary school students to learn environmental components?

**Answer:** In my view the present approach is student centered based on textbooks ideas. If teachers are prepared students can be benefited, and learn through participation

- 8. Question:** How do you judge the quality of primary school textbook in terms of EE component integration?

**Answer:** Gama kanaan hanqinni jira. In this context, there is shortage of textbook, 1:3/4 to

student ratio. Quality wise, the quality of textbook is good particularly English with ability and preparation students can be empowered, 3rd and 4th maths are beyond students ability.

### GeSoS13f-8

- 1. Question:** What are the concepts of environment, environmental sustainability?

**Answer:** naannoon waanta naannoo ttiin ibsama. Fkn mukkaa guddaa-Qiltuu, Oomo, Omii,

Bahaa kkf. fa'a. Kunuunsa naannoo, bareechuu, ababoo dhaboon, biqiltoota daree,

qe'ee naannoo piroojektiin hojjenne agarsiisuun shaakalchiissuf ni yaalama. Environment can be represented by things it comprises, for example big trees like Qiltuu, Omo, Omi, etc. Environmental conservation, beautifying, cultivating flowers, school and home garden plants growing are considered.

- 2. Question:** What is your view toward EE content integration in primary school subjects?.

**Answer:** Barattootni waan argaani ni hubatuu, hojjechuun agarsiisuu fi ibsaan qabatamaa taasifama. Bo'oo basuu, biqiltuu dhaabuu; kanaafu hammatamuun issa gaariidha. waantootni jirenyaaf barbaachisaan omishaaf gaariidha. Barnootni kamiyyuu naannoon alaa mit. Integrating EE contents into primary school subject is judged important because students understand what they observe and heard and practiced. For example terracing and growing plants important environmental experience. It is crucial sources for producing things needed for living, and any subject can not be free of environment.

- 3. Question:** To what extent EE contents and issues are integrated into primary school subjects? **Answer:** Haala ga'an saayinsii naannoo keessa jira, darbe darbe immo Afaan Oromoo fi herregnis

qabu Herregaa qoyyoobota ittiin barsiisuf oola. EE contents are incorporated adequately in environmental science, rarely in Afan Oromo. The environmental elements included in maths are used to teach mathematical computation.

- 4. Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?

**Answer:** Ga'umsii barsiisota gamaa lamaan ilaalamu dandaa'a- hubannoo warrii qabanuu jiru kan

immoo qabiyyee kitaabaa qofatti kan xiyyeefatanus jiru. Barsiisan waan eebifameen osoo barsiise gaariidha. Leenjiin barsiisuma dura(TTI) wa'ee naannoo qaba, amma (diploomaa) haala ga'aa mit. Teacher differ in competence, some are well abled while others only restricted to textbook contents. It will be better if teachers assigned to teach subject in which they are qualified. The former teacher education programs incorporated better environmental components as compared to the recent one.

- 5. Question:** How do primary school teachers relate EE to local experience and real life in context of teaching environmentally integrated primary school subjects?

**Answer:** EE components are infused other subjects of the primary school. Fakkeenya

naannootti argamuutti fayyadamuun barsiisuun jira. Garuu, hubannoon muuxannoo naannoo akka barbaadamuun hin jiru. For instance employing examples from the environment is notable, but local environment experience consideration appears negligible (not as desired).

**6. Question:** How do primary school teachers demonstrate competencies to teach environmentally integrated subjects?

**Answer:** Akka gosa barnootaa ittiin ebbifameeti gaumsa qaba jedhama. Garuu hojiitti hiiku irratti barsiisaa giddu addaddummaan jira. Qabiyyee naannoo ibsuuf hubachiisuun irraa keessa (shallow) ta'uun hinafuu. Teachers are competent in their qualification area but at implementation level there are individual difference among teachers as a result explaining and clarifying EE contents tend to be shallow. This gap can be attributable to individual capacity difference

**7. Question:** What opportunities are available for primary school students to learn environmental components?

**Answer:** Carraa barachuu barattootaf sochiin barsiisaa murteessadha. Amma kana, carraan qabiyyee barachuu ballaadha. Fakkeenyaaf Saayinsii naannoo fi A/Oromoo naannoo irratti hunda'a. Qabiyyee kitaaba biratti gummiwwanii adda addaa kan akka kunuunsa naannoo, shamaranii, Afaani, amalaa gaarii ...carraa dabalataati. Teachers' efforts are decisive for students' learning opportunities, accordingly currently there widechances to learn environment related contents. For example learning in environmental science and Afan Oromo are based on environment, this is supplemented by different clubs such as environmental conservation, language...

**8. Question:** How do you judge the quality of primary school textbook in terms of EE component integration?

**Answer:** Ok, Waa'ee naannoo irratti qophiin kitaaba gaariidha. Fakkii fi gochaaleen ijoolleen ni hubatu. The quality of primary school textbook is good, the figures and learning activities are clearly structured.

#### GeCiv15f-9

**1. Question:** What are the concepts of environment, environmental sustainability?

**Answer:** Naannoo bakka jireenyaa, iddoo hammata. Environment refers living place and setting

**2. Question:** What is your view toward EE content integration in primary school subjects?.

**Answer:** Qabiyyeen naannoo gosoota barnoota baayyee keessaa jira. Saayinsii naannoo ballinaan argama, kan akka herregaa keessaatti hinhammatamuu. Eegaa, ni barbaadamaa, sababni issa barnootni hundaaf ni barbaachiisaa, bu'uuraa. EE contents are found in most of the school subjects. It is covered in environmental science widely but almost none in mathematics. EE contents integration into primary school subject is desirable for it is a base for everything.

**3. Question:** To what extent EE contents and issues are integrated into primary school subjects?

**Answer:** Qabiyyeen bifa adda addaan gosa barnoota sadarka 1ff a keessa jira. Saayinsii naannoo keessatti baayyinaan yammu jiratu herrega kessatti ni xinnata. The EE contents and issues are integrated at a varying magnitude in primary school subjects. EE components are numerous in environmental education but rare in mathematics

**4. Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?

**Answer:** Carraqqii hubannoo irraatti hunda'u ilaalchise barsiisonni adda addummaa qabu. Akka kooti hubadheen barsiisa. Mata dureen naannoo yoo jirate nan barsiisa, meeshaalee deggarsaan nan cimsaa malee, mata duree alaa ba'uun hin ta'u sadarkaa ijoollee wajjin deemu qaba. Sababni gragarummaa barsiisotaa, hubannoo, carraqqii, tattaaffii adda addaa ta'uudhaa. Regarding the conscious effort of teachers there is difference among teachers, but on my part I strive to teach environmental contents available in the textbook also supplement with learning aids. But moving out of the textbook topic is not possible because the maturity level of children need be considered. Teachers differ in skill, effort and commitment and these may be a factor.

- 5. Question:** How do primary school teachers relate EE to local experience and real life in context of teaching environmentally integrated primary school subjects?  
**Answer:** Muuxannoon naannoo (hawaasaa) xinnoon jira. Fakkeenya Geeraan kaanan dura bosoonaan uwwifamtu akka turteef garii caaluu mancaa'u issaaf yaada kunuunsa naannoon waliin ni kaafna. There are little of local (community) environmental experiences in primary school curriculum. But we discuss how the formely dense cover of forest in Gera has been degraded.
- 6. Question:** How do primary school teachers demonstrate competencies to teach environmentally integrated subjects?  
**Answer:** Gosa barnoota ofii irraatti gaumsa qabu, garuu qabiyyee naannoo barsiisu irratti walqixa mit, tooftaa barsiisutiinis adda addaa. Teachers are competent in their subject area but can not be equally competent in teaching EE content in their subjects, including the approach of teaching they apply.
- 7. Question:** What opportunities are available for primary school students to learn environmental components?  
**Answer:** Adeemsii barnoota yeroo ammaa barataa giddu galeefataadha. Barattoota irratti jijjiramini dhufa jira? Eeyye abaaboo dhaabun, qulqullina ofii eegun foyya'ina ta'a. currently the teaching-learning process is learner-centred and this give options for students. Regarding students learning environmental contents, yes, benefited from involving in growing flowering plants and sanitation activities.
- 8. Question:** How do you judge the quality of primary school textbook in terms of EE component integration?  
**Answer:** Kitaabni barattoota gaariidha. Baayinaan gochaalee fi shaakala hammatame barattoota ni hojjechiisa. The textbook is good, the activities and exercises designed are hoped to engage learne

#### MenBio9f-10

- 1. Question:** What are the concepts of environment, environmental sustainability?  
**Answer:** naannoon wantoota nu marsanii jiranu dha. Environment means things surroundingus.
- 2. Question:** What is your view toward EE content integration in primary school subjects?  
**Answer:** I consider the integration of EE components into primary school as important and strive to teach at department wide. Barsiisoni qabiyyee naannoo itti amaan barsiisa jiru. All teachers consider and teach environmental contents.
- 3. Question:** To what extent EE contents and issues are integrated into primary school subjects?  
**Answer:** Gosini barnoota baayyeen naannoo irratti xiyyeefata, caalamaan biqilootaa irraatti. Qabiyyeen naannoo gosa barnoota saayinsii gara gadii 1-6ti ballaa gara oliitti garuu dhiphoodha. qabiyyeen naannoo gosa barnoota hunda keessa jira ballinaa fi dhiphinaan adda addaa ta'a malee. Barnoota saayinsii keessatti qabiyyeen naannoo haala gaariin hammatamadha taarii akka herregaa keessatti ga'a mit. Most school subject focus on environmental issues, especially on plants. The EE contents and issues integrated in science 1-6 broadly and narrower upward, there are environment related contents in all primary subjects but with a varying size. EE components are adequate in science perhaps negligible in mathematics.
- 4. Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?  
**Answer:** Barnoota daree gochaan hubachiisuuf carraqqiin jira. Garu barattootni sababa rakkoo adda addaa fedhiin issaan laafaadha. There is effort to make the classroom learning meaningful through involvement; however, due to different reasons the students are less interested.
- 5. Question:** How do primary school teachers relate EE to local experience and real life in context of teaching environmentally integrated primary school subjects?  
**Answer:** Barsiisonni hedduun qabiyyee kitaaba qofaa irraatti xiyyefatu; kan immoo, Sirritti dubbisuun naannoo irraatti hubannoo uumu. Muxxaannoo hawaasa naannoo

fayyaduu osoo dabalame, leenjiin kitaaba dhiyaatu fi tooftalee barsiisuu irratti osoo jirate. Many teachers are restricted to textbook content, while some read and enrich awareness about content they teach-environmental contents. Yet inclusion of local community experience, training on textbook and on methods of teaching need to be considered.

**6. Question:** How do primary school teachers demonstrate competencies to teach environmentally integrated subjects?

**Answer:** Barsiisonni muumee koo gaumsii issan qabiyyee naannoo barsiisuu irratti qabanu ga'aadha. Garuu barsiisota giddu garagarummaan dandeetti fi tattaaffii jira. Meeshaalee deggarsaa itti fayyadamuu irraatis anqinni ni mu'ataa.

**7. Question:** What opportunities are available for primary school students to learn environmental components?

**Answer:** Qabiyyee naannoof carraan barattoonni qabanu ballaadha. Innis kitaaba irraa, allaa, wantoota naannootti fayyadamu fa'i. Students have a wide opportunity to learn environment related contents. These include textbook, and other environmental materials.

**8. Question:** How do you judge the quality of primary school textbook in terms of EE component integration?

**Answer:** ok qabiyyeen gosa barnoota akka bayyiolojii ballaa ta'uuf wayitiin ramdamef xiqqaachuu Qajeechii barsiisaa fi kitaabni barataa walsimuu hafuu fi ifaa ta'uu hafuun rakkoodha. Anqinni meeshaalee laabroritii barattoonni itt himuu fi deebbisuun akka baratanu tasiisa. The large content coverage and fewer periods allotted, mismatch of teachers guide and textbook have been noted in biology subject. Shortage of laboratory materials made the teaching-learning process forced to follow telling and question and answering paterren.

#### MenGeo33m-11

**1. Question:** What are the concepts of environment, environmental sustainability?

**Answer:** Hiikn naannoo akkumaa barnoota keenyaati hubatamaa. wantooni akka biqilootaa, bosoonu uumamaa iddoo itti argaman naannoodha. The meaning of environment may vary by subject type. Elements nature such as plants and forest and where they are found constitute environment.

**2. Question:** What is your view toward EE content integration in primary school subjects?

**Answer:** Akka qabatama keenyaati yoo ilaalee, qabiyyeen fi dhimii naannoo kitaaba sad. Tokkoffaa keessaa ga'aa mit. Fakkeenyaaf qabiyyee qonnaan walqabatu dhiphaachuu. In terms of my subject there are no enough environment related contents and issues in the primary school subjects for example agricultural issues are lacking.

**3. Question:** To what extent EE contents and issues are integrated into primary school subjects?

**Answer:** Environment related contents and issues are integrated into social study, but not adequate. In the context of the region the contents covered lacks depth and diversity

**4. Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?

**Answer:** Waa'ee naannoof quqaamuu irratti walfakkanna. Teachers exhibit similar concern about the environment. The textbook fails to touch specific contents to from different regions of place.

**5. Question:** How do primary school teachers relate EE to local experience and real life in context of teaching environmentally integrated primary school subjects?

**Answer:** This is practiced in our case to a limited level. Carraqiin muxxannoon walqabsiisu ni ta sifama, garuu ga'aa mit. Relating teaching-learning process to real local environment is practiced though not sufficient.

**6. Question:** How do primary school teachers demonstrate competencies to teach environmentally integrated subjects?

**Answer:** In our context teachers are prepared professional most of them are receiving first degree. In teaching environment related contents there could be limitation because of individual difference in commitment, and less support available from related structures. Sadarkaan barnoota barsiisota foyya'aadha. Barsiisonni jiruun itti cimuu, miindaa itti qufuu dadhabuu hojii dhunfaa

irratti xiyyeefachuu fi kaka'umsii lafuun rakkoolee darbani darbani mullatanuudha. Teachers appear competent as their educational level is improved. But the expensive living condition, dissatisfaction in solary, low commitment are some of the felt problems.

**7. Question:** What opportunities are available for primary school students to learn environmental components?

**Answer:** Qophiin fi qabiyyeen kitaaba barnoota hawaasa gaarii waan ta'ef barataa nigargaara. Barsiisani hubachiisuf ni tattafataa. The design and structure of the social study textbook is better so suits leaning, more over teachers tries to support students learning. Memo-classroom teaching, textbook content focused; no urging students to learn from immediated environment

**8. Question:** How do you judge the quality of primary school textbook in terms of EE component integration?

**Answer:** The current social study textbook appear better than those before. Yet the contents covered are core ones and description are too short to be compreheded by students. At the same time the informations are not adequately supported by illustrations such as figures and maps as desired. Odefennoon gagaboo(dhiphoo) ta'e dhiyaatee, fakkii, mappii fa'iin gabbifamuu barbaada. Gochaalee, gaaffiiwwan ga'aan hin qindofine. Independent learning is not being encouraged. The content details are brief and the activities and exercises appear scarce.

#### MenHis13f-12

**1. Question:** What are the concepts of environment, environmental sustainability?

**Answer:** Wantootaa bakka ijoolleetti argamanu, wantoota naannoo hubachiisanu kan akka nyaataa, bu'uura jireenyaa, laggeen, biyyee kkfn. Environment may refers to things found where children live and those used to represent environment like food, necessities of life, rivers, soils etc.

**2. Question:** What is your view toward EE content integration in primary school subjects?.

**Answer:** Qabiyyeen naannoo ilaalu barnoota sada. Tokkoffaa keessatti hammatamuun isaa fudhatamadha. Naannoon wantoota jiruu namaaf barbaachiiso waan ofi keessaa qabuf. Incorporating EE contents into primary school subjects is important because it comprises things needed by humans to survive.

**3. Question:** To what extent EE contents and issues are integrated into primary school subjects?

**Answer:** currently, as far as I know no primary school subjects disregard environment related contents and issues. Saayinsiin naannoo, qabiyyee naannoo haala ga'aan of keessaa qaba; ballinni kutaa gadii irraa gara oliitti dabalaa. Yoo ilaalle barnootn biroo naannoo uumamaa osoo hintaane hawaasummaa kan ilaalan jiru. Fakkeenyaaf barnoota hawaasaa. Ballinaa adda addaa ta'ulee barnoota hundaa keessa qabiyyeen naannoo jira. Environmental science comprises adequate environment related components, scope increases with grade level. Be it natural or social environment all subjects incorporate some of such components at a varying magnitude.

**4. Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?

**Answer:** We strive to engage students in learning including environmental contents like plants, experimenting etc. Meeshaalee deggarsaattiin barsiisuu-kaartaa, dirree dowwachiissuu. Qophiin sirna barnoota gaariidha; barattooni itti gammadani baratuu, gochaa, gilgaala, marii waliintiin baratuu. Teaching aids like maps and methods of teaching such as field observation, practice and discussion are some what applied

**5. Question:** How do primary school teachers relate EE to local experience and real life in context of teaching environmentally integrated primary school subjects?

**Answer:** Barnoota muxxannoon fi jireenyaan walqabsiisun amma barbaadamuu mit. Kun mana barumsa magaala keessaatti argamuf barattooni daa'imman ta'uu fi humnii murta'aa ta'uu. Garuu amma danda'amu fakkeenya naannoon walqabsiisun ni yaalama. The effort of linking learning with life and experience of the immediate environment is not as intended particularly in urban setting, integrating nature related experience problematic; it is further limited by the low maturity level of children and financial constraints.

- 6. Question:** How do primary school teachers demonstrate competencies to teach environmentally integrated subjects?  
**Answer:** gama gaumsaatiin rakkoon mullatu hinjiru. Teachers are trained and fit to the level and textbook preparation is ok. Barsiisoniin haala gaariin barsiisuu danda'uu, garagarrummaan jiru ballaa mit akka fedhiin barattoota adda addummaa qabuti. There is no clear problem regarding competence, teachers can handle teaching the variation among them is not so great but students' interest.
- 7. Question:** What opportunities are available for primary school students to learn environmental components?  
**Answer:** carraan qabiyyee naannoo barachuuf qabanuu akka kutaa kooti(4) ga'aadha. Barnoota kutaa wajjin, gochaan-shakaluu, abaaboo dhabuu, manatti yaalani gabasuun ni baratuu. The opportunity students have to learn environment related content say in the case of grade 4 is enough. The classroom activities, practical exercise-planting flowers, experimenting at home and reporting are included
- 8. Question:** How do you judge the quality of primary school textbook in terms of EE component integration?  
**Answer:** Rakkoo jechoota haara qunnamu alaa, kitaabn barataa saayinsii naannoo qabiyyee sirriitti qinda'aa, gochaalee kan qabu dha. Except the prevalence of new concepts or terms the environmental science textbook is well organized and activities inclusive.

### MenGeo21f-13

- 1. Question:** What are the concepts of environment, environmental sustainability?  
**Answer:** akka Afaan Oromooti qabiyyee uumamaa fi aadaa ni hammatama. Naannoo irraa-biyyoo, mukaa, meeshaalee hojjeechuun naannoo isaaan hubatu. In the case of Afan Oromo natural and cultural environment components are integrated where students are assisted to understand natural elements dealing with materials from mud, soil, trees etc.
- 2. Question:** What is your view toward EE content integration in primary school subjects?  
**Answer:** qabiyyee naannoo gosa barnoota keessa jirachuu namn hindeggaree jira hin jedhu ani. Because incorporating EE contents into primary school subjects helps students understand their real environment and values etc.
- 3. Question:** To what extent EE contents and issues are integrated into primary school subjects?  
**Answer:** the EE content covered into primary school subjects seems sufficient, though it tends to be difficult for some kids.
- 4. Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?  
**Answer:** I strive to teach EE contents and issues covered in the textbook, but I doubt there is gap between teachers and curriculum developers intentions. There is no effort of orienting teachers on curriculum as seen so far. Sirna barnootaa fi kitaaba barataa ilaalchise waantii barsiisotaati himaame hinjiru caalisaani eergu ala. I think it seems that the curriculum makers and school teachers do not know each other, they simply send textbook to school.
- 5. Question:** How do primary school teachers relate EE to local experience and real life in context of teaching environmentally integrated primary school subjects?  
**Answer:** The textbook tend to focus on general features rather than diverse physical and cultural aspects of the regions. Fakkeenyaaf Oromiyaan akkuma gandaa tokkotti walfakkeessutu jira. The school level practice also shows similar limitation where teachers are not equally informed about the local experience or pro environmental knowledge.
- 6. Question:** How do primary school teachers demonstrate competencies to teach environmentally integrated subjects?  
**Answer:** Teachers are competent to handle environment related contents and issues in their subjects but in different depth and details this concerns language area.
- 7. Question:** What opportunities are available for primary school students to learn environmental components?

**Answer:** Students learn theoretical knowledge from class-room interaction

**8. Question:** How do you judge the quality of primary school textbook in terms of EE component integration?

**Answer:** The quality of primary textbook is ok, yet very limited specific example or experience of the region is infused. Considering the region as homogeneous is problematic.

#### Menphy29m-14

1. **Question:** Concept-Environment- naannoon?

**Answer:** I teach concrete things of our surrounding

2. **Question:** View toward the integration of EE contents and issues

**Answer:** The incorporation of EE contents and issues into the primary school is desirable including maths and physics. The integration is important because students will get knowledge and skills that can be applied in life. Haala itt fayyadama qabeenyaa irratti hubannoo ni argatuu barattooni. Students understand how to utilize resources

3. **Question:** To what extent EE components are integrated into primary school subjects?

**Answer:** there are environment related contents in mathematics; for example land plot can be used as an example in world problems. However, talking about adequacy is not simple, due to unlimited human aspirations. We need to research to identify scope of EE contents.

4. **Question:** Is there a conscious effort to integrate and teach EE content and issues in other subjects?

**Answer:** Fedhiin qabiyyee naannoo hammachiisu yoo jiraate iyyu hojiirraa oolchuu irratti rakkoon jira. Barnootni yaad-hiddamaa irraatti xiyyeefata. Kun harka caabaan mana kabuu yaaluu fakkata. Gargaarsii xiqqaachuunis rakkoo fida. Though there is a need to incorporate EE components, implementation is problematic, the subjects often focus on theory, hence it is like trying to mend items with broken hands moreover lack of support from line bodies is impediment.

5. **Question:** How are local experience and real life issues considered in teaching EE components in other subjects of the primary school?

**Answer:** Beekumsii guddaan hawaasa keessa jira. Garuu qoratamee barnootaa keessa haala barbaadamun osoo hingaliin hafe. There are un tapped knowledge in the community but not integrated into the educational programs.

6. **Question:** how do primary school teachers demonstrate competence in teaching EE components in other subjects of the primary school?

**Answer:** Teachers' competence at our school is better because most of them have improved their educational status (degree holders); this also more prompted by short term training focusing on capacity building and skill development.

7. **Question:** What opportunity do primary school students have to have to learn environmental components in other subjects?

**Answer:** There is effort to empower students particularly female.

8. **Question:** How do you judge the quality of primary school textbook?

**Answer:** The textbook tend to characterize to dominate with computation information that urge teachers to show and explain more. Qamni itti gaaffatamummaa fudhatu hinbeekamu. kitaabni yeroo gabaabaa keessatti jijjiiramuun dhiibbaa fida. waldarbuu qajejaa brsiisa fi kitaaba barataa rakkoo mul'ate. There are problem related to curricular materials, frequently changing textbook and mismatch of some parts of teacher's guide and textbook being a few.

#### MenEng32-15

1. **Question:** Concept-Environment -naannoon?

**Answer:** Ok, Environment for me includes plants, soils, every thing around us; Issue of saving them.

2. **Question:** View toward the integration of EE contents and issues

**Answer:** The integration of EE contents into primary school subjects is important. It helps

students to understand the language skills, new words, and vocabularies from passages. Akababiin ye mimeleketu yizetoch alfo alfo tekatowal. contents soils, plants. Environment related contents are included into primary school subjects- including English for language skill development rather than as core topic. Environment related contents are included into language (English) textbook rarely.

3. **Question:** To what extent EE components are integrated into primary school subjects?

**Answer:** The EE content is not adequately covered in English textbook. In English we teach the rarely infused environment related content

4. **Question:** Is there a conscious effort to integrate and teach EE content and issues in other subjects?

**Answer:** On my I attempt to teach EE contents incorporated in the textbook. But if not included no way of teaching such contents. In English we treat the rarely infused environments and issues related content

**Question:** How are local experience and real life issues considered in teaching EE components in other subjects of the primary school?

**Answer:** I think considering local experience even making an Ethiopian is not effective enough

5. **Question:** how do primary school teachers demonstrate competence in teaching EE components in other subjects of the primary school?

**Answer:** I strive to handle EE contents integrated into English subject. But I lack information about environmental learning content

6. **Question:** What opportunity do primary school students have to have to learn environmental components in other subjects?

**Answer:** English textbook is ok in content, activity design

7. **Question:** How do you judge the quality of primary school textbook?

**Answer:** There is limited opportunity to learn EE contents in English textbook it serves mainly as media.

#### SekHis13f-16

1. **Question:** Concept-Environment -naannoon?

**Answer:** Yes, naannoon haala teesumaa lafaa qilleensaa, bosonaafi qabeenyaa uumamaa biroo

ilaala. Akka barnoota hawaasatti dabareewwan uumamaa fi nam-tolchee ni dabalaata. Wantoota lafaa irraa jiranu hunda fi lafaa naannoo keenyaa. Yes environment includes Landscape air conditions, forest and other natural resources, in the context of social studies those natural and human created heritages are referred to hence it is about everything found on the earth and our surrounding

2. **Question:** View toward the integration of EE contents and issues

**Answer:** hammatamuun isaa ni fudhatama, barnootn hawaasa qabiyyee naannootiin waan walitti toluuf. Integration of EE contents and issues into social study is acceptable; because social study contents match with environmental education

3. **Question:** To what extent EE components are integrated into primary school subjects?

**Answer:** I can say environment related contents and issues are adequately covered into social study textbook. For example of the four chapters covered in sixth grade social study text two chapters deal with environmental issues.

4. **Question:** Is there a conscious effort to integrate and teach EE content and issues in other subjects?

**Answer:** Akka kooti mata dure diyyate meshaalee deggarsaa fi gochaalee itti fayyadamuun barattoota hubachiissuf nan carraaqaa. On my part I endeavor to make the intended content understandable using media and activities.

5. **Question:** How are local experience and real life issues considered in teaching EE components in other subjects of the primary school?

**Answer:** Ok, there exists some issues of local experience in social study textbook like cultural Experience; but practical and outdoor learning chance is lacking.

6. **Question:** how do primary school teachers demonstrate competence in teaching EE components in other subjects of the primary school?  
**Answer:** There could be challenges in this regard there is no orientation given on textbook in general or EE contents teaching. Social study area appears less regarded currently.
7. **Question:** What opportunity do primary school students have to learn environmental components in other subjects?  
**Answer:** students are supported in group in classroom learning. There are clubs such as environmental conservation club.
8. **Question:** How do you judge the quality of primary school textbook?  
**Answer:** the primary school textbook tend to be unrelated to maturity level of the students, difficult for most of them. Rakkoon hubannoo fi lafuun deggaarsaas ni mullataa. At the same time loose awareness and support involved

### SekBio30m-17

1. **Question:** Concept-Environment -naannoon?  
**Answer:** Wantoota naannoo keenyaati argaman kan akka lubbu qabeeyyii fi lubbuu maleeyyii yookan qamoolee phiizikaala fi qamoolee baayyolojiika diyyaate(fkn. kitaaba kutaa 7 fi 8 keessaatti). The concept of environment may refer to living and non living things or physical and biological elements as covered in 7<sup>th</sup> & 8<sup>th</sup> grade textbooks.
2. **Question:** View toward the integration of EE contents and issues  
**Answer:** akka ani ilaalutti baayyee barbaachiisadha. Sabaani waanti hundii naannoo irraa ka'aa, akkasumaas faayidaa naannoo hubataani kunuunuf ni tola. For me Integration of EE contents into all primary school subjects is very necessary for everything is contained within the environment , likewise we need to understand its benefit in order to conserve environment.
3. **Question:**To what extent EE components are integrated into primary school subjects?  
**Answer:** Qabiyyeen naannoo(biyyee,bishaan, binelada, albuuda.) ilaalu kitaaba barataa baayyoolojii keessati hammatamadha. Haata'uu malee, gadii fageenyaa hinqabu, gochaan shakaluu fi hubachuu irratti rakkoon yeroon walqabatu jira. EE contents like soil, water animals and mineral etc ., are available in primary school biology textbook; however, not treated in depth and encounter shortage of time for exercising and meaningful understand.
4. **Question:** Is there a conscious effort to integrate and teach EE content and issues in other subjects?  
**Answer:** Qophiin walqabate, gochaan, dowaachiisun rakkiisadha sababa anqina yeroo. Barnoota baayyoloojii qabiyyeen fi gachaaleen ballaa ta'e osoo jiru wayiitiin gabaabachuun rakkoo ta'eera. Regarding the design of textbook activities, visiting inclusion become problematic due time constraint. The biology contents and learning activities tend over weigh the allocated period.
5. **Question:** How are local experience and real life issues considered in teaching EE components in other subjects of the primary school?  
**Answer:** Muuxanno naannoon walsimsiisu kitaabn ni ajajaa, ogeesotaa- fayyaa, qonnaa kkf mayaachiisuuf hubannoo dhiyeesu ykn gabassuu. The textbook urge relating the subject content to the real local experience, for example assignment seek consulting health or agricultural practitioner or agents and reporting to the class are designed..
6. **Question:**how do primary school teachers demonstrate competence in teaching EE components in other subjects of the primary school?  
**Answer:** garagaruummaan barsiisota giddu jiratuiyyu, qabiyyee gosotaa barnoota keenyaa keessaa sirriitt hubachiisuuf sochiin ni taasifna. Though there could be individual difference among teachers, we thoroughly attempt to make all the contents covered in other subject.
7. **Question:** What opportunity do primary school students have to learn environmental components in other subjects?  
**Answer:** carraan qabiyyee naannoo barachuu ballaadha, garuu carraa jiru hojii irraa oolchuun anqina qaba. Daree fi gummiwwani toftoo jiranu, yammuu ta'anuu fedhiin barattoota lafaadha. There are wide opportunity to learn environment related contents but implementation involves limitation. The classroom based instruction and stages of clubs

- are opportunities available though the interest of students low.
8. **Question:** How do you judge the quality of primary school textbook?  
**Answer:** akka baayyolojiiti, qabiyyeen naannoo qinda'ee yaadanoo, gochaalee, fi wayiitiin ramadame walgitaa mit. Qabiyyeen waldura dubiin eegama fi walsime hinfakkatu. In biology textbook, the environment related substantive contents, activities and the time allotted does not seem congruent. At the same time some of the structured contents characterize incoherent.

### SekAO17f-18

1. **Question:** Concept-Environment naannoon?  
**Answer:** Ija afaanin, ijooleen wantoota isaani tti dhiyoo irraa ka'uun barchuun isaan fayyada. Barnootni afaani wantoota naannoo irratti hunda'aa. In language context children learning will be meaning if related to the their immediate environment, and language teaching often is environment based.
2. **Question:** View toward the integration of EE contents and issues  
**Answer:** haala ga'aan hin hammatamn malee barbaachiisadha. Naannoo irratti hunda'ani barachuun hubannoo cimsaa, bu'uura barnoota fuula duraas ta'a. Integrating environmental component is acceptable though not well considered. It is important because linking lesson to environment concretize learning and serve as foundation for future learning.
3. **Question:** To what extent EE components are integrated into primary school subjects?  
**Answer:** Qabiyyeen naannoo kitaabaa Afaan Oromoo keessa jira garuu ballaa mit. EE contents are integrated into Afan Oromo textbook but not many.
4. **Question:** Is there a conscious effort to integrate and teach EE content and issues in other subjects?  
**Answer:** There is gap in this regard. Leenjiiin, ofi guddisuu, qorrachuun gama barsiisotatnii ni barbaachiisa. Training, self growth, serearching are important for teachers.
5. **Question:** How are local experience and real life issues considered in teaching EE components in other subjects of the primary school?  
**Answer:** barnoota muxxannoo naannoon walsimsiisun anqina qaba.kun sababa xinnachuu tattaaffii barsiisota, daree keessatti baayyachuu barattootati. There is limitation regarding considering and infusing local environment related experience. This is because of low effort from the side of teachers and large class size.
6. **Question:** how do primary school teachers demonstrate competence in teaching EE components in other subjects of the primary school?  
**Answer:** there is an effort but seems inadequate, perhaps attributable to difference in capacity, commitment and attitude among teachers.
7. **Question:** What opportunity do primary school students have to have to learn environmental components in other subjects?  
**Answer:** carraan qabiyyee naannoo baraachu ballaadha; garuu fedhii barattoota lafadha. Barnootni, daree, minimedia fi gummiiwwan jiruu akka carraatti. The available opportunity to learn environmental contents appear wide but the students interest are loose. Classroom instruction, minimedia and other clubs can be cited as chance.
8. **Question:** How do you judge the quality of primary school textbook?  
**Answer:** kitaabni barataa ciminas anqinas qaba. Kitaabni Afaan Oromoo bubbisa, gilgala, kkf hammachuun isaa gaariir yammu ta'u, salphaachuu fi walgitu hafuun gochaalee tokko tokko immo fakkeenya anqina jiranutti. The Afan Oromo textbook characterize strength and weak features for example availability of some sensible passage and exercise as well as simplicity, and mismatch of activities exemplify these features.

### Sekche9m-19

- 1. Question:** What are the concepts of environment, environmental sustainability?  
**Answer:** wantootaa noonnoo of keessa qabu lubbu qabeeyyii fi lubbu maleeyyii; akkasumaas akka tajaajila kennu, kunuunsuu, midhaa hambisuu waliin deema
- 2. Question:** What is your view toward EE content integration in primary school subjects?  
**Answer:** **hammatamuun is barbaachiisadha, naannoo hubaachisa** caalaa waan beekanu irraa ka'anii gara isaa haarati deemuf.
- 3. Question:** To what extent EE contents and issues are integrated into primary school subjects?  
**Answer:** Qabiyyee naannoo barnoota sadarka tokkoo keessa jira ballinii fi gadii fageenyii amma barbaadamu mit malee. Fakkeenyaaf keemistrii kutaa 7 fi 8 boqqoonaa tokkoo qofa keessatti mata dureen naannoo(Qilleensa) qinda'e
- 4. Question:** Is there conscious effort to integrate and teach EE contents and issues in primary school subjects?  
**Answer:** **I have doubt about the existence of conscious effort to** integrate EE content into their teaching; qabiyyee naannoo irratti leenjiin gargaaru hinjiru.
- 5. Question:** How do primary school teachers relate EE to local experience and real life in context of teaching environmentally integrated primary school subjects?  
**Answer:** **Answer:** muxxannoo naannoon walsimsiisuun qubsaa mit. Hubannoo dhimmaa naannoo irratti dhabuu barsiisota fi anqina meeshaalee dhiibbaa fidaan.
- 6. Question:** How do primary school teachers demonstrate competencies to teach environmentally integrated subjects?  
**Answer:** Barsiisonni hubannoo qabu garuu gochaalee if yaaliwwa ni shaakalchiisu irratti rakkoo qabu. Leenjii irratti dhabbata adda addaa giddu anqina garagaaraa jira
- 7. Question:** What opportunities are available for primary school students to learn environmental components?  
**Answer:** carraa amma ta'e qabu, xiqqoohubattuu
- 8. Question:** How do you judge the quality of primary school textbook in terms of EE component integration?  
**Answer:** Kitaabn barataa ammaa hjiirra jiru gaariidha. Garuu gadii fakkeenya dhabuun, qabiyyeen dagataaman jirachuu, dogoogora qabaachuun anqinoota inni qabuudha.

### SekMath30m-20

- 1.Question:** Concept-Environment naannoon?  
**Answer:** wantootaa naannoo keessaatti argaman akkaa meesha deggarsaa fa'a ilaala.
- 2.Question:** View toward the integration of EE contents and issues  
**Answer:** it is important.
- 3. Question:**To what extent EE components are integrated into primary school subjects?  
**Answer:** Qabiyyee naannoo herreegaa keessatti xiqqoodha sababn isaa herreegn lakkoofsaa irratti waan xiyyeefatuuf
- 4.Question:** Is there a conscious effort to integrate and teach EE content and issues in other subjects?  
**Answer:** Qabiyyeen naannoo gosaa barnoota hundaa keessa bifawalfakkatuun hubatamaa mit; keessattu herreega keessatti ga'aa mit.
- 5.Question:** How are local experience and real life issues considered in teaching EE components in other subjects of the primary school?  
**Answer:** The design of the curriculum seems centralized; it does not reflect specific local situations of the country or region.

6. **Question:** how do primary school teachers demonstrate competence in teaching EE components in other subjects of the primary school?

**Answer:** Gosa brnoota isaani irratti barsiisonni gaumsaa hin dhabanu qabiyyee naannoo herrega keessa jiruus akka meeshaa deggaarsaatti ilaalama.

7. **Question:** What opportunity do primary school students have to have to learn environmental components in other subjects?

**Answer:** Akka waliigalatti carraan qabiyyee barachuu ga'an jira, karaa biraa hirmaanan barattoota laafaadha- mana baru msaatti hafuu

8. **Question:** How do you judge the quality of primary school textbook?

**Answer:** Anqinaa qaba; kaayyoo fi qabiyyeen wal hinsimuu

#### **SekNsc14m-21**

1. **Question:** Concept-Environment naannoon?

**Answer:** naannoo uumamaa keenyaa, jireenyaa ijoolleetti, kunuunsii naannoos kana wajjin deema.

2. **Question:** View toward the integration of EE contents and issues

**Answer:** integrating EE content and issues into primary school is very important because it contributes for indepth understanding at the same pedagogically the classroom teaching need be connected to real environment.

3. **Question:** To what extent EE components are integrated into primary school subjects?

**Answer:** the currently functioning textbook is somewhat good in covering environmental components but not adequate

4. **Question:** Is there a conscious effort to integrate and teach EE content and issues in other subjects?

**Answer:** I think there is no such clear effort in focusing on environment related contents both at curriculum and teaching-learning level. I noted differently, that community are striving to conserve natural resource of urged by government

5. **Question:** How are local experience and real life issues considered in teaching EE components in other subjects of the primary school?

**Answer:** Qabiyyee dhiyyate barsiisuu, barsiisan ajajaamaa waan ta'eef kana wajjin Afaan Oromoo amma wayiitti tokkoo keessaatti waan jaha tuu raawwatama. Kanaafu muuxxannoo fi jireenya walqabsiisuun, gadii qabani shaakalchiisun danggeefamadha.

6. **Question:** how do primary school teachers demonstrate competence in teaching EE components in other subjects of the primary school?

**Answer:** primary school teachers can be considered as competent by training. Moreover even their life experience can support them consider environmental issues. Leenjii idilee biraatti hawaasnis barsiisaa barsiiseera jedhamaa. If the contents are incorporated in the textbook teachers can teach. Barsiisan akka abba ogummaatthi cimiinaan dhimma naannoo irraatti sochii taasisuu hafuu

7. **Question:** What opportunity do primary school students have to have to learn environmental components in other subjects

**Answer:** Akka Afaan Oromoo tti carraa qabiyyee naannoo barachuu dhiphoodha yammu saayinsii naannoo waliin ilaa lamuu. Kara bira sababa yeroon qabiyyee fi gachaalee karoo fameen qabamu hojii dareen alaa dabaluu

8. **Question:** How do you judge the quality of primary school textbook?

**Answer:** qindoomini kitaaba Afaan Oromoo, qabiyyee fi gochaalee walfakku irradeddebi'amu. Yeroo gabaab kessatti waan heddu rawwaachiisuuf yaaluun dhiibbaa qaba

#### **SekEng30m-22**

1. **Question:** What is the concept of environment or naannoon

**Answer:** It appears difficult to teach environmental contents to the kids in English without translation

2. **Question:** View toward the integration of EE contents and issues

**Answer:** It is very important, yet in English context environmental components are used as learning aid for language learning

3. **Question:** To what extent EE components are integrated into primary school subjects?

- Answer:** There are some environment related contents and issues infused in primary school English textbook though not adequate.
4. **Question:** Is there a conscious effort to integrate and teach EE content and issues in other subjects?
- Answer:** As a teacher I am striving to address the contents covered in the textbook. But the contents structured appear urban-oriented. As a result some of the designed activities tend to be beyond the capacity of the children.
5. **Question:** How are local experience and real life issues considered in teaching EE components in other subjects of the primary school?
- Answer:** In the case of English, EE components are used as learning aids.
6. **Question:** how do primary school teachers demonstrate competence in teaching EE components in other subjects of the primary school?
- Answer:** Generally it is ok; I try to connect to the environmental elements though as resource for language skill development; at the same time I understand that a teacher cannot be good in all subjects.
7. **Question:** What opportunity do primary school students have to learn environmental components in other subjects?
- Answer:** In my view, there is good opportunity for students to learn environmental contents, though students exhibit less interest and effort for their learning
8. **Question:** How do you judge the quality of primary school textbook?
- Answer:** the English textbook of the primary school tend to be dominated by information without visualization or dominated by information with less visual illustrations

## Appendix 4: Instances of EE Topics and Contents covered in primary school

### Subjects

**Table 1:** Summary of EE Contents and Issues sufficiently integrated into Primary School Subjects (Source: Syllabi and Textbook of primary school)

Contents and Issues of EE by Subject	Main Topic	Contents	Periods allocated		Remark
			Per content	Per unit	
<b>1.1.</b> Topics, and contents of EE as integrated into Grade two Environmental Science	1.Ourselves	1.1. Our Food 1.2. Our Health 1.3.Personal Hygiene	17 17 17	51	
	2.Our Social Environment	2.1. Our Community members 2.2. Living in the Community 2.3. The Energy we need 2.4.Producing materials, models from different sources	15  14 9 15	53	
	3.Our Natural Environment	3.1. Matters 3.2. Natural Resources 3.3. Vegetations/plants 3.4. Animals	17 13 15 13	58	integrat ed  Natural aspect
	4.Our Wereda/Sub city	4.1. Location 4.2. Landscape/Relief 4.3. Institutions 4.4. Economic Activities	13 10 9 17	49	
<b>1.2.</b> Topics, and contents of EE as integrated into Grade four Environmental Science	Unit 1: Our body	1.1. Our body needs food 1.2.Bloodcirculation 1.3. Puberty 1.4. Family planning	10 15 15 15	55	All appear pertinent to environmental areas
	Unit 2: Our natural environment	2.1. Matter 2.2. Natural resources 2.3. Energy 2.4. Water	15 15 20 5	55	

4 <sup>th</sup> Grade ES	Unit 3: Our country	3.1 What is country? 3.2 Major economic activities  in Ethiopia	25 30	55	
	Unit 4: Our social environment	4.1 Historical and cultural heritages of Ethiopia  4.2 Social relations and values	30  15	45	
(Kutaa)Grade	Boqonnaa fi Mata uree( Units and Topics	Qabiyyee (Subunits or contents)	Wayiitii (periods allotted)		
<b>1.3.</b> Topics, and contents of EE as integrated into Grade Seven Biology  (Baayolooji kutaa 7)	1:Baayoloojii fi Teekinooloojii  (Bioly andTechnology)	1.1. Maalummaa Baayoloojii  1.2. Warshaalee beekumsa baayoloojiitiin fayyadaman  1.3. Ga’ee baayoloojiin Hawaasa keessatti qabu  1.4. Baayoloojii fi teekinooloojii halaa  1.5. Sonaawwan barnoota baayoloojii	2  2  2  2		10
	2:Baayoloojii Seelii  (Micro biology)	2.1. Maayikirooskoppii fi faayidaa isaa  2.2. Seelii  2.3. Seelota ilaalu  2.4. Akaakuu seelii, boca seelii fi hamma seelii	5  3  4  1		13
	3:Baayoloojii namaa fi fayyaa  (Human biology)	3.1. Sirna maashaa fi sirna lafe guutuu  3.2. ilkaan namaa	10  5		15
	4: Biqiloota  (Pants kingdom)	4.1. Garaagarumma biqilootaa  4.2. Biqiloota daraaraa	3  22		25
	5: Bineeldota  (Animals)	5.1. Garaagarumma bineeldotaa  5.2. Seena jireenya ilbiisota tokko tokkoo  5.3. Ilbiisota barbaachisoo ta’an tokko tokkoo  5.4. Ilbiisota gamtaa	2  4  6  11		23
	6:Naannoo  (Environment)	6.1. Bidoollee  6.2. Bidoollee qo’achuu	3  8		16

		6.3. Hariiroowwan soorata	5	
<b>1.4. Topics, and contents of EE as integrated into Grade Eight Biology</b>  (Baayolooji kutaa 8)	1. Baayoloojii fi Teekinoojii (p.1)	1.1 Gahee baayoloojiin misooma keessatti 1.2 Bu'aawwan teekinooloojii baayoloojiif fayyadan	3 4	7
	2. Baayoloojii Seelii (p.11)	2.1. Orgaanizimoota seel-qeenxee ilaalu 2.2. Orgaanizimoota seel-qeenxee 2.3. Sadarkaa gurma'iina Orgaanizimoota seelii hedduu	5 12 6	23
	3. Baayoloojii namaa fi fayyaa (p.25)	3.1. Sirna wal hormaata 3.2. HIV fi AIDS	14 10	24
	4. Biqiltoota (p.43)	4.1. Nyaata biqiltoota magariisan qophaa'an 4.2. Biqiltoota guddisuu	7 10	17
	5. Bineeldota (p.55)	5.1. Bineeldota kunuunsuu	13	13
	6. Naannoo (p.65)	6.1. Sirnakkoo 6.2. Hariiroowwan baayoloojikaalaa 6.3. Qabattoota Fiizikaalawaa sirnakkoo	3 3 12	18
	<b>1.5. Topics, and contents of EE as integrated into Grade Six Social Studies</b>  (Saayinsii Hawaasa kutaa 6)	Unit 1: Location, Settlement and People of East Africa  (Argama, Qubannaa fi Haala Jireenya Ummata Baha Afrikaa) (p.1)	1.1. Location 1.2 The people of East Africa 1.3 The protection and preservation of heritage sites and problems encountered at heritage sites. 1.4 Settlement and livelihood in East Africa 1.5. Factors for the variation of settlement and livelihood	3 4 2 6 4
Unit 2: Earth, Our Home  (Lafa Irra Jiraannu) (p.22)		2.1 The surface of the earth 2.2 Major landforms of East Africa 2.3 Water resources in East Africa	4 4 2	19

		2.4 Water and its economic use in East Africa 2.5 The atmosphere 2.6 Conventional signs and symbols	2 2 5	
	Unit 3:Our Environment  (Naannoo Keenyaa)  (p.42)	3.1 Natural vegetation and wild animals in East Africa  3.1.1 Factors that affect distribution of natural vegetation and wild animals in East Africa  3.2 Human interference and disturbance to our environment  3.3 Methods of conserving water and soil  3.4 National parks and their importance in Ethiopia and East Africa	2  2 4	14
	Unit 4: Public Agenda  (Ajandaa Ummataa)  (p.58)	4.1. Population related issues  4.2. Rapid population growth 4.3. Children’s rights and their safety 4.4 Escaping strategies 4.5. Accident prone practices and safety measures 4.6 Partnership issues	4  2	16
<b>1.6.</b> Topics, and contents of EE as integrated into Grade Seven Social Studies  <b>(Saayinsii Hawaasa kutaa 7)</b>	1.Afrikaa keessa jirnnu  Living in Africa  (p.1.)	1.1 Argama, Baldhina fi Danaa Ardii Afrikaa  1.2 Sarran Dagalee fi Gadee  1.3 Maatii Afaanota Gurguddoo Afrikaa...  1.4 Qaroomman Afrikaa Durii  1.5 Mootummoota Afrikaa sirna kolniin Duraa  1.6 Daldalli karaa Dheeraa Ummata Itoophiyaa Walqunnamsiisuuf sababa ta’uu isaa  1.7 Ummata Afrikaa	3 3 3 2 2 3	23
	2.CaasaaBaqqaana Lafaa  Structure of the Earth  (p.36)	1.1. Kaartaa irraa Odeeffannoo Barbaaduu fi Itti Fayyadamuu  1.2. Baqqaana Lafaa  1.3. Gosootaa fi Akkaataa Uumama kaattalee		12

	3.Sirma Ikkoo fi Rakkoolee Isaa  The Ecosystem and its challenges  (p.51)	1.2. Biqiltoota Uumamaa, Bineensota Bosona Beekamoo fi Barbaachisummaa Isaanii  1.3. Bishaan, Biyyee fi Qilleensa  1.4. Kunuunsa Qabeenya Uumamaatii fi Tarkaanfiiwwan fudhatamuu Qban		16
	<ul style="list-style-type: none"> <li>• 4.Ajadaa Ummataa</li> <li>• Public Ajenda</li> <li>• (p.61)</li> </ul>	<ul style="list-style-type: none"> <li>a. Dhimmoota Ummataan Walqabatan</li> <li>b. Dhimmoota Mirgaa fi Nageeyyaa</li> <li>c. Sagantaawwan Dhaabbileetti Hirmaachuu</li> </ul>		17

**Table 2: EE Contents and Issue incorporating to some and limited extents into Primary Schools Subjects (Source some selected primary school syllabus and Textbooks**

Environmental Elements and issues	Subjects and Grade level	Location by textbook page	Main messages explained and emphasized
<b>5.1 Some EE contents and issue integration</b> <i>Fakkiwwan biyneeldoota</i> (picture of animals)	<b>Afaan Oromoo Kutaa 2 (Afan Oromo Grade 2)</b>	P 14	<i>Amaloota isaani ibsame</i> (characteristics of animals)
<i>Gilgaala 4</i> (Exercise on sanitation) <i>Naannoo ofii qulqulleessuun malliif barbaachisa ?</i> <i>Biqiltuu maaliif kunuunsu?</i>	>>	P. 16	<i>Qulqullina dhunfaa fi nannoo eegu. Qaama fi dareefi mana barumsa qulqulleessuu miidhagsu Qulqullina ofii daree moora ilkaan eeguu</i> <b>(Activities on Environmental sanitation and Personal Hygien)</b> <i>Barbaachisummaa biqiltuu kunuunsu naanno fi qulqulleessuu</i> <b>(The importance of plant conservation)</b>
<i>Biqillota bishaan obaasu</i> (Watering plants) <i>Biqiltuu mukaa</i> (tree pants) <i>Dama</i> (honey) <i>Faayidaa bunaa</i> (uses of	>>	Gilgaala (p. 29 )  (pp.30-31)  p.43  p 57	<i>.Biqiltuu waddeessa dhaaban kunuunsan guddatee, gaadisa ta'a</i> Planting the seedling of Waddessa(Wanza), conserving it so that grow and serve in proving shade Dandeetti afani ciimsaa. The environmental elements mentioned tree, honey, coffee were mainly used interms of language skill development. They are also mentioned in activities and exercises as indicated below. <i>Bakka duwwaa himoota gutii jechootni hima barreessi (fill inbank space)</i>

coffee)			<i>Filannoon gaafii deebiissuu (p33)(multiple choice)</i> <i>Dhugaa ykn soba (p.34)(true or false)</i>
<i>Hallu naannoo keenya</i> (our environmental scene / color)	<i>Afaan Oromoo Kutaa 4</i> (Afan Oromo Grade 4)	Page 4-6	<i>Naannoon keenyaa wantoota dinqisiisoo hedduu qabu. Biqiltoota daraaraa adda addaa jirachuu fi ilbiisonni fi allaattiiwwan bifa garagaraa kanaa irratti hunda'uu.</i> <b>Our environment is endowed with various beautifying natural elements. Plants and plants flowers, insects and birds of different colours represent this gift.</b>
<i>Bishaan--Water</i>  <i>Roobaa fi Qonna</i> (Rain and agriculture)	>>	Pages: 8—10 Qilleensa qabanaa fi lafaa gaaraa fi Bosonaa	<i>Nannoo roobni ga'an, jiidhaa, margii, biqiloonni biro ni marguu qonnaaf mijaata dha bishaan bakkaa roobni ga'a hintaanetti goginsa fiida.</i> <b>In rainy and wet areas, grasses and other plants flourish, agriculture can be practiced; however, where there is not enough rain drought occurs.</b> <i>Libbu qabeeyyiin hundii bishaanin jiraatu(all living things live on or supported water)</i> <i>Namootni bishaan dhimmaa addaaf oolchuu (humans use water for many different purposes</i> <i>Maddi bishaani lafaa, hanqinni bishaan hoongee fidaa(the source of water is earth, lack of water causes drought)</i> <i>Boolii namaa fi faltii beeyladaato bakka booliitti gatuu naannoo bishaan, fi ofii keenyaa qulqullinaan eegu(protecting water.)</i> <i>Mudda bishaan qulqullinaan qabu(cleaning sources of water)</i>
<i>Ittisa dhibee garaa kaasaa;</i> (preventing dysentery-Health)	>>	Pages: 12-14	<i>Nyaata fi bishaan quullinaa qabani itti fayyadamuun dhibee of irra ittisuu(preventing diseases by keeping food and water clean)</i>
<i>Mukaa (Tree)</i>  <i>Looni (Cattles)</i>	>>	Pages: 88-90	Gilgala (p. 88) (Exercise) Gaadisaa ta'uun roobaa harkisaa faayidaa namoota keenuu(trees serve us shade, source of rain, provide economic benefit) Namootaf faayida adda addaa kennu (Cattle sender different uses for humans) <i>Dikeen isaani biyyee gabisaa(cow dang can be used as natural fertilized)</i>
<i>Dhiqama Biyyee (soil erosion)</i>	>>	Pages:101-105	<i>Biyyeen sochii namootaa fi addemsa ummattiin haxaawama; ciramuun bosonaa fi mukaa dhiqama biyyee fida.(soil is eroded by boyh huma activities and natural factors. Clearing forest and cutting trees is the cause of soil erosion.</i>
<i>Busineesota kunuunsu (conservation of wildlife)</i>  <i>Lagoota keenyatti fayyadamuu"</i>	>>	Pp.120  p.15	<i>Namoon nageenyaa fi mirga lubbuu qabeeyyii biros kabajuufi kabaachiisuu (humans should respect and also safe guard the life and security of other living things).</i> <i>Namoon shira bineensoota irratti dalaguu(humans are harming wild animals)</i> <i>Faalama qilleensa naannoo araa warshaalee keessa bahuu bineensa, lagaani faala kun immoo bineensota lafaa irraa fi bishaan keessa ni galaafatti(air pollution caused by industrial effluents and water pollution injure both terrestrial and aquatic animals</i> <i>Lagoonni gurguddaan kan akka Abbyyaa, Gannaalee, Baaroo, Gibee gara daangaa biyyoota ollaatti yaa'uudhaan biyyaa biraa sooru; biyyee gabbataa keenyaa dhiqaanii geessuuf.</i>

<p><b>5.2. Limited EE contents and issue integration</b> Weather of Assosa ‘ Rain maker’</p>	<p>English Grade 4</p>	<p>Pages: 43,  Pages: 49</p>	<p>Rainy and cold week, cloudy, sunny, wind days Shortage of rain and its effect. Rivers dry up plants and seeds to not grow, people and animals have not food Rain maker advised the village people to protect their environment. She suggests ‘ you must plant frees so that the rains will always come (supporting pictures p. 51)</p>
<p><b>Activity:</b></p>			<p>Read and write sentences (pp. 52-54)</p>
<p>Healthy eating Activity Read statements fill words in chart Pictures of foods and drinks(p. 115) Wild animals’ names and pictures. National Park (Oromo )</p>		<p>pages:121  page; 65  Pp.165,167 P 181</p>	<p>Drink clean water, keep your body hands fingers nails, hair clean (pp, 63-64). Balanced diet: producing cereal crops, vegetable and others like insets, fruits Activity 1-5 (pp, 74.875): Repeat words, talk about pictures, share sentences, copy tables. Description of animals’ names and characteristics .Yet, no information on their importance, care and concern. Different types of wild animals (mammals birds are kept)</p>
<p><i>Lakkofsonni entijeerii tuuta lakkoofsaa, sararan</i> (Sets of integers)</p>	<p>Mathematics 7<sup>th</sup> grade (Barnoota Herrega kutaa 7)</p>	<p>PP4-5</p>	<p>No message pertinent to environment. Tuula / set of rational integers could have been represented and describe using environmental elements. Can be connected to the environment and real experience but neglected.</p>
<p><i>Tempiraacherii fixee tulluu guyyaa adda addaa</i></p>	<p>&gt;&gt;</p>	<p>P 16-22</p>	<p>Tempiraacherii fixee tulluu guyyaa dura 3 ture guyyaa illamuutti 5n gadii bu’e towagitti ddda adda</p>
<p>Boolii bishaan kuusuu</p>	<p>&gt;&gt;</p>	<p>P 46</p>	<p><i>Boolii bishaan kuusuu fi qopha’e</i></p>
<p><i>Baynii lubbuu qabeeyyii lafaa irraa walxiqummaa</i></p>	<p>&gt;&gt;</p>	<p>p-48</p>	<p><i>Gilgaala 5.3.55 soba ykn dhugaa jechuum barreesi. Biqiltuu mukaa waa’ee reeshoo ibsame(Explaining about ratio using seeds of trees)</i></p>

## Appendix: 5 Summary Instances of K-12 Curriculum Framework

### Components

Note about subjects offered to primary school level (1—8) and corresponding time table. Learning areas for this level are structured into 5 themes: Aesthetics, languages, mathematics, natural science, and social science.

**Table 1: Number of periods allocated to each subject per week in Grades 1–4, making 30, periods/week**

No	Subject	Grade			
		1	2	3	4
1	<b>Amharic</b>	3	3		
2	<b>Arts and Physical Education</b>	6	6	6	6
3	<b>English</b>	6	6	6	6
4	<b>Environmental Science:</b> broadly integrated and combines contents from natural science, social science, health, agriculture, home science and civic education	7	7	7	7
5	<b>Mathematics</b>	6	6	6	6
6	<b>Mother Tongue</b>	5	5	5	5
Total periods per week		<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>

**Table 2: Number of periods allocated to each subject per week in Grades 5–8, making 30 periods/week**

No	Subject	Grade			
		5	6	7	8
1	<b>Amharic</b>	3	3	2	2
2	<b>Biology</b>			2	2
3	<b>Chemistry</b>			2	2
4	<b>Civics and Ethical Education</b>	3	3	3	3
5	<b>English</b>	5	5	5	5
6	<b>Integrated Science:</b> separate science subjects brought together. Structured as theme and comprise 6 themes: Air, Water, plants, Animals, Our body and Earth + cross cutting issues	4	4		
7	<b>Mathematics</b>	5	5	5	5

8	<b>Mother Tongue</b>	3	3	3	3
9	<b>Visual Arts and Music</b>	2	2	1	1
10	<b>Physical Education</b>	2	2	2	2
11	<b>Physics</b>			3	3
12	<b>Social Studies:</b> integrated study of social science. Considers themes, culture, time continuity and change, people and their environment...etc.	3	3	2	2
<b>Total period per week</b>	30	30	30	30	30

**Source: K-12 Curriculum Framework pp. 20-22(MoE, 2010)**

**Appendix 6: Summary of instance of possible Environmental Education contents to be integrated into school curriculum as perceived by different authorities**

**Table 2: Extent of integration of EE contents and issues**

No	Extent of integration of EE contents and issues	Possible components to be considered and infused	Authority	Remark
I	<b>Sufficient Integration</b>	Addressing both cognitive, affective and psychomotor intents or domains on environmental matters in balanced way	Sarmah and Bhuyan 2015	Detail contents treatment and conveying environmental message is expected
		The above view is comparable to Palmer's (1998) education about, in and for the environment or Tilbury's (2005) head, hand and heart, for similar domain representations.		
		<ul style="list-style-type: none"> <li>Integrating awareness giving contents on environmental problems of different sorts like soil erosion, pollution, forest destruction</li> <li>Incorporating sufficient examples from students' immediate environment. This is what I considered as pro environmental indigenous or local knowledge or experience</li> <li>Considering project activities on environmental issues</li> </ul>	Sarmah and Bhuyan 2015	
		<ul style="list-style-type: none"> <li>Ecology(Environment) and humans: concept, ecosystem, population and its dynamics, energy and environment, sustainable development</li> <li>Environmental science and environmental health: humans, <b>soil</b> and related problems <b>water</b> and associated problems, food production, <b>plants</b> and <b>animals, forest</b>, protects of natural resources, <b>air</b> and related problems, wastes(hazardous), human population growth and regulation</li> <li>Environmental problems and interventions</li> <li>Identifying issues and researching</li> </ul>	UNESCO-UNE 1994	
	Some extent integration	Partial integration of environmental contents and messages. Partially addressing soil, water, plants or air related	Sarmah and Bhuyan 2015	

		issues (emphasis is mine). Covering environmental problems and related local experiences		
	Limited Integration	Rare integration of environment related contents like animals, plants, temperature etc. without detail environment messages.	Deduced from the preceding observations	

Sources adapted from different sources of literature

## **Declaration**

Hereunder I verify that this thesis is my original work and has not been presented for a degree in any other University. I also make sure that all the source materials used in this study have been duly acknowledged.

**Name:** \_\_\_\_\_

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Submitted to:** Department of Curriculum and Instruction

The dissertation has been submitted with my approval as University advisor.

**Name:** \_\_\_\_\_

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_