IMPLEMENTATION OF ISO 14001 IN LEATHER INDUSTRY IN ETHIOPIA: THE CASE OF ETHIOPIAN TANNERY SHARE COMPANY

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Title

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List of Abbreviations and Acronyms

ADLI	Agricultural Development Led Industrialization
ASTM	Americans Standard Testing and Material
BAT	Best Available Technology
BS	British Standards
CSA	Central Statistics Authority (Ethiopia)
CP	Cleaner Production
DAs	Development Assistant
ECPC	Ethiopian Cleaner Production
ELIA	Ethiopian Leather Industries Association
EMP	Environmental Management Program
EMR	Environmental Management Representative
EMS	Environmental Management System
EPA	Environmental Protection Authority (Ethiopian)
EPO	Environmental Protection Office(Oromiya)
ES ISO	Ethiopian Standard International Organization of Standardizations
ETA	Ethiopian Tanners Association
ETSC	Ethiopian Tannery Share Company
FAO	Food and Agricultural Organization
FDI	Foreign Direct Investment
FGD	Focus Group Discussion
FNG	Federal Negarit Gazeta
HACCP	Hazard Avoidance and Critical Control Point
ISO	International Organization of Standardizations
LCA	Life Cycle Assessment
LLPTI	Leather and Leather Product Technology Institute
ME	Ministry of Education (Ethiopian)
MH	Ministry of Health(Ethiopian)
MI	Ministry of Information (Ethiopian)
MTI	Ministry of Trade and Industry(Ethiopian)
NBE	National Bank Of Ethiopia
P2	Prevention of Pollution
PAs	Peasant Association
PCP	Pentachlorophenol
PDCA	Plan-Do-Cheek-Act
QMS	Quality Management System
QSAE	Quality and Standard Authority of Ethiopia
SAGE	Strategic Advisory Group on Environment
TC	Technical Committee
UNCTAD	United Nation Conference on Trade and Development
UNIDO	United Nation Industrial Development Organization
VA	Voluntary Agreement
WB	World Bank
WT	Working Team

Abstract

The study managed to investigate the ISO 14001 implementation process and its implication on environmental performance of organization, the management and equipments of ETSC. The study focused on examining selected issues such as: opportunity and motivation to implement EMS based on ISO 14001; obstacles during system designing that impeded a good judgment, systematic planning and cultural building; the role of environmental training to create personnel that is competent to handle the work and believe as part of the EMS; operational control mechanism in order to prevent, control and avoid adverse effects; and interactions and relationships with stakeholders to support and influence environmental stewardship of tanneries. To achieve this objective, a multifaceted methods are employed that include content and progressive analysis of the tannery EMS and stakeholder document, observation, interview with key informants, community survey and FGD. Accordingly, the study identified that the main forces behind the adoption of ISO 14001 in the tannery were external drives such as ECPC free consultation service and advantage of ISO 14001 certificate as green passport to developed world market. However, the tannery's EMS lacked motivation from stringent government command and control action and social responsibility of the tannery. The study also highlighted the benefits of environmental considerations as a result of resources utilization of byproduct (glue making and hair saving) and source reduction of Chromium. The result has shown the difficulties of linking and interpreting of environmental policy to the tannery's activities environmental aspects identification, prediction, evaluation and EMP preparation. The study also revealed the lack of objectivity (measuring) and system approach (integration) of the designing part of the tannery's EMS by focusing on pollution prevention, regulatory requirement, the concern of interested parties and feedback mechanism to maintain and obtain a continual improvement of environmental performance spiral. Implementation of the system has not caused the tannery to focus and build environmentally conscious workers as well as operation control for virtually working system that should go beyond compliant performances. The result also highlighted that the tannery's EMS has had little effect to consider the concern of nearby community. The stakes of stakeholders have been synthesized and resulted in primary (EPA, MTI and EPO), Intermediary(ELIA) and secondary(QSAE, LLPTI and ECPC) scale even though stakeholder gave very little attention to influence and support the implementation of ISO 14001 in the country's leather sector. In conclusion, there are strong demands for government support to build more reliable and continually improving EMS. This includes stakeholders to be integrated, ISO 14001 related research, more positive incentive (tax exemption, elongated tax holiday, facilitation of knowledge and technology transfer) for firms performing sustainable environmental behavior and disincentives (denying benefits, negative publicity and strict follow up) for those who are not.

Keywords: *designing phase; environmental policy; environmental training; ETSC; EMS based on ISO 14001; operational control; stakeholders*

CHAPTER ONE

1. Introduction

1.1 Background

Ethiopia, being a country with a predominantly agricultural economy, is endowed with huge livestock population that leather industry derives its raw material. According to FAO (2003), Ethiopia has 35.5 million herds of cattle, 11.4 million sheep and 9.6 million goats which gave 2.8 million cattle skins, 8.3 million sheep skins and 7.5 million goat skins in the year 2002. As a result of this livestock resource, leather and leather products play a significant role in the national economy, being the fourth in the country's export item next to coffee, oil seeds and chat in 2004/5. For instance, the sector accounted for about eight percent of the country's foreign exchange earning through semi-processed hides and skins in the same period (Befekadu and Berihanu, 2000; UNCTAD, 2002 and NBE, 2006).

The aforementioned livestock population is a reliable and renewable resource base for leather industry. However, the hides and skins that reach to the industry are poor in quality as a result of traditional rearing with low level of disease and pest control and serve for draft purpose. Moreover, hides and skins are also affected by careless slaughtering or fleshing. Improper way of conserving hides and skins and inefficient local consumption also contributed to resource depletion and quality deterioration for the output of leather industries. Due to these reasons, therefore, about 40 percent of hides and skins from the actual flesh are considered to be a loss (Yohanes, 1996 and Arbei, 2004).

According to Ministry of Trade and Industry (M.T.I.), the pillar of development strategy in this country is Agricultural Development Led Industrialization (ADLI) which aims at enhancing industrial growth and the over all economy through agriculture as an input. Hence, it prioritizes export oriented industries (MTI, 2005). In such a development strategy, therefore, the leather sector will have a significant role in transforming the economy in terms of absorbing a huge labour force and generating income (FAO, 1995).

However, industries were developed in an optimist or *laisser-faire* views. The outlook considers a linear, effective and efficient interaction and utilization of natural resource. It promotes the use of resources to bring economic and social advancement at any cost. They believe technology, at

its highest development stage, will provide solution to environmental problem (Titenberg, 1998). However, industries as a whole have impact on environment as result of inefficient production process, obsolete technology and outdated work procedure, ignorance on the role of human resource development, inefficient energy use and limited capital. These led industries to deplete natural resources, pollute the environment and in turn have impact on public health and the sector's image in the market. However, the rise of environmental movement and green politics forced several industries to develop sustainably. These include economic well-being, social equity and environmental protection. Industries are required to change their attitude toward the utilization and disposal of natural resources as waste is inefficiency of their production system. Hence, investment on environmental protection will pay later. Prevention and precaution measures and ecological strategies (Reduction, Reuse, Recycle, or Avoidance) are recommended to mitigate their impact on the environment (Peankline, 1989 and Yacob, 2004). Therefore, leather industry in general and the Ethiopian Tannery Share Company in particular is not exceptional since they use natural resources as an input such as raw hides and skins, water and chemicals. Besides, along with their output like pickled, wet blue, they also generate solid and liquid waste and gaseous emission that are potentially hazardous pollutants (WB, 1998; UNIDO, 2000 and UNIDO and EPA, 2003).

With this respect, EMS based on ISO 14001 is identified as a powerful approach to assess how the organization, management and equipment are performing in relation to legal, regulatory requirement and sound environmental practice. Here, the approach is a compliant standard that encourage an adaptive environment management. The ISO 14001 tools are aimed for continuous improvement often known by the Plan DO Check Act (PDCA) cycle. The cycle needs to be developed and integrated in to all sub systems of the industry to handle or avoid their contagious effect. It helps to aid the manager in identifying resource wastage and process inefficiency (Diamond, 1997). Besides, ISO 14001 is subject to top management commitment and demand complementary support of pertinent stakeholders such as Environmental Protection Authority (EPA) and MTI. It is an inward looking to environmental protection and prevention concern that existed locally, nationally or internationally (Bridgen, 1997; World Investment Report, 1999 and Sterner, 2003).However, this has never been tested in Ethiopia's industrial sector. The aim of this study, therefore, is to fill the gap by examining the environmental performance of leather

industries, specifically Ethiopia Tannery that contribute 35 percent of the sector's export market (ETA, 2004).

1.2 Statement of the Problem

Leather processing unit is characterized by a contagious effect (continuous causal relationship) to next process quality and its impact on environment. The sector identified as cause of a significant and potential environmental aspect (Breen and Dellarco, 1992; Thorstensee, 1993; WB, 1998; UNIDO 2000; GE, 2001; ECPC; 2002; Petry *et al.*. 2002; EPA, 2003 and UNIDO and EPA; 2003) whose impact on environment should be assessed (Petry *et al.*2002 and EPA, 2003). Besides, the country's leather sector exports its product to developed world market. In developed world market, technical specification is mandatory and voluntary standards are the response to consumer preference which is known by *non-tariff barrier* (Lowson, 1999; GE, 2001; Khan, 2003; ETA, 2004 and Teshoma, 2004). Here, different approaches were developed to assess the incorporation of sound environmental practice, prevention and precaution measures and ecological strategies (Reduction, Reuse, Recycle, or Avoidance), in the industries (Peankline, 1989 and Yacob, 2004). They are classified in to *end -of- pipe* and *inside pipe* view. An *end - of-pipe* approach is a retrospective assessment that looks after waste is produced. Different studies showed the limitation of the approach (Burch, 1996; Callan and Thomas, 1996; Titenberg, 1998; White *et al.* 1998; Jones and Hollier, 2002 and Sterner, 2003) and indicated the need to move a more proactive and integrated assessment (Jones and Hollier, 2002; Sterner, 2003 and Wainwright and Muleigan, 2004).

The *inside pipe* view is a recent type of assessment. It includes ISO 14001:2004. ISO 14001:2004 has an integrated framework to prevent and manage waste. The standard is appropriate both for small and big firms and different cultural settings. It is also subjected to a continual improvement of environmental performance through a *Deming Cycle,* Plane-Do-Check-Act (Wever, 1996; Diamond, 1997; Wilson and Sassiville, 1999 and Besterfield *et al.* 2001). It requires an inward approach to integrate in plant measure and end pipe treatments to comply national and international environmental requirement.

However, to take EMS specification, principle and good environmental practice from theory to practice, EMS research needs to focus on tools and strategies that could help to overcome

implementation barrier and pitfalls (Wever, 1996; Diamond, 1997; Wilson and Sassiville, 1999 and Besterfield *et al.* 2001). This standard requires the commitment of top management for visible and steady flow of resources. It needs to assess the motivation factors and identify the forces driving the adoption of EMS in order to keep the intervention focused and sustained. ISO 14001:2004 requires the definition of realistic, concise and measurable environmental policy that links components of the standard. Lack of skills, knowledge and expertise to conduct a preliminary environmental review might not identify deficiencies (waste stream) from source (storage, production, point discharge, leak and spillage), type (whether hazardous or non hazardous) and cause (management or operator attitude or procedure). A life- cycle, from cradle to grave, approach should be taken for these assessments.

Besides, it requires identification of all environmental aspects and objective evidences for prioritized improvements and preventive action. Identifying the required resource for prevention of pollution, encouraging internal and external communication and educating and training employee in order to prevent, control and avoid adverse effect are basic tenets. An institutionalized compliance with all relevant environmental laws, regulations and customer responds is also required. Finally, implementation of ISO 14001: 2004 in the country's leather sector demands the support and complimentary effect of stakeholders. However, it is little known about the industry in general and the leather industry in particular among others, how their organization, management and equipment perform interims of legislation requirement and sound environmental practice with respect to the above tailored approaches.

1.3 Objectives of the Study

The general objective of this study is to investigate the organization, management and equipment performance of the leather industry against the principle and criteria of EMS based on ISO 14001:2004 good practice. The specific objectives are to:

1. investigate the level of compliance of the tannery EMS associated with the environment policy and Environment Management Plan (EMP) component of designing of the tannery EMS,
2. assess how prevention of pollution activities operationalized i.e. reduction of input (water, Chromium and Sulfide), recovery of chemicals (Chromium), resource utilization (Hair saving

and trimmed utilization) and avoiding of unecofriendly inputs (leather with preservation problem and banned chemical (azody, PCP and Hexavalent Chromium) and operational control,

3. identify strategies and challenges associated with the competence, training and awareness of the tannery EMS,
4. assess the interactions, perceptions and roles of stakeholders (Community, E.P.A., E.P.O., M.T.I., L.L.P.T.I., Q.S.A.E., E.C.P.C. and E.L.I.A.) to communicate, support and influence the implementation of ISO14001: 2004 in tanning industry, and
5. suggest some sound and plausible recommendation to appraise, mitigate and/or at least minimize the environmental problem in relation to the leather industry in particular and to the sector in general.

1.4 Basic Research Questions

In order to make the stated objectives attainable, the following questions has given due attention.

1. How was the tannery motivated to implement ISO 14001:2004?
2. What are the designing parts of environmental management systems in place in the tannery?
3. What are the measures taken by the tannery to implement Pollution Prevention Strategy? (Focused on reduction of input (water, Chromium and Sulfide), recovery of chemicals (Chromium), resource utilization (Hair saving and trimmed utilization) and prevention of unecofriendly inputs (banned and blacklisted chemical like azody, PCP and Hexavalent Chromium) and operational control.
4. What are the strategies followed and challenges faced by the tannery in relation to the competence, training and awareness component of the EMS?
5. What are the interactions, perceptions and roles of stakeholders (Community, E.P.A, EPO, M.I.T., L.L.P.T.I., Q.S.A.E., E.L.T.I. and E.L.I.A.) to communicate, support, influence implementation of ISO14001: 2004 in tanning industry?

1.5 Significance of the Study

There are two frontiers that the findings from this research will be useful. Firstly, it will direct policy makers on issue of environmental protection and natural resources management so as to devise a sound and meaningful strategy on the subject. Secondly, practitioners could also benefit

from the outcome of this research by understanding as to how to apply the principles and criteria of EMS based on ISO 14001:2004 in their day to day routine work to improve the efficiency of their organization, management and equipment.

1.6 Scope and Limitations of the Study

Although there are 24 tanneries operating in the country, the study is made on the biggest tannery, Ethiopian Tannery Share Company, only. Though, ISO 14001:2004 standard has 17 requirements, this research has focused on the implementation of identified critical issues and their implementation of EMS. It's focused on main environmental performance parameters that limited the research to include the exhaustive picture of tanning activity. The research is also limited in that, the investigation delimits the incorporation of stakes of Ministry of Agriculture and Rural Development that deals with the quality of raw hides and skins, Ministry of Water Resource that focused on the effect of pollution on water body (end of pipe). Furthermore, it was limited to cover financial institutions (Banks and Insurances).

1.7 Organization of the Study

In the next section, the study domain and research design are presented that include how both qualitative and quantitative method were used, why ETSC selected as a case, phases of data collection and analysis (content and progressive analysis of document, community survey, systematic observation, workers and key informants interview). It also contains techniques of gathering supplementary information from Focused Group discussion (FGD) and wastewater laboratory analysis. Chapter three presented the proposed theoretical framework that focused on critical factors for successful implementation of ISO 14001:2004 and the contracts are explained. In chapter four, the results of the assessments within the case begin by discussion why EMS was adopted and how they plan for environment. It also gives the finding related to evaluation of environmental training and operation control. Chapter five presented the perception of nearby community toward the tannery's EMS and the stakeholders influence and support for the implementation of ISO 14001 in the leather sector. The last section contains the conclusions and recommendations drown from the study finding that may overcome implementation challenge associated to the EMS.

CHAPTER TWO

2. Research Methods and Data Source

Both quantitative and qualitative research methods are employed in this study for data gathering, processing and analysis (Creswell, 2003). Because, environmental issues are multidisciplinary ones that require a wide range of information to investigate and understand in what way the system works. Moreover, the approach, ISO 14001:2004, has a promising fortune (ISO, 2005) in low level of regulatory body control and as a result of limited knowledge in environmental impact prediction (Jones and Hollier, 2002 and Sterner, 2003).

2.1. Site Selection and Description of the Study Area

Ethiopian Tannery is selected as a unit of analysis purposefully from 24 Tanneries in Ethiopia. First, assessment or investigation of one institution for its natural resource and environment management is a scientific option (Jones and Hollier, 2002). However, it should be rich in information and big enough for investigation (Yin, 2003). In this respect, Ethiopian Tannery is the biggest leather industry not only in Ethiopia but also in East Africa. It contributes about 35 percent of the county's leather export and almost 80 percent of local consumption.

Ethiopian Tannery Share Company (ETSC): It is a public owned enterprise, under the management contract of Pittards, established under the technical cooperate agreement signed between the Ethiopian government and the former Czechoslovakia government on December 11, 1959. The tannery is located in Edjersa Kebele of Lome Wereda, near to Mojjo Town about 90 km, South of Addis Ababa. The tannery is located on unpopulated rural area and has well organized store, production halls, water treatment plant pumping out of Awash River, maintenance workshop, clinic with ambulance and its own primary and secondary waste treatment plant. The tannery landfills its solid waste within its compound for the last 30 years. Most of its workers' residences are in nearby towns such as Koka, Mojjo, Nazareth and Debrezeit. Moreover, it obtains electrical power from Koka Hydroelectric Power Station and has an access to Ethio- Djibouti road and railway routes (ETSC, 2004).

The tannery was erected about one kilometer from Awash River, with 650,000 square meters of area and a quarter of it is covered by infrastructures. It started production in 1976 with 293 Ethiopian employees and 12 Czechoslovakian experts. At the first trial production, its input was about 3000 pieces of raw skins and 400 hides per day. At present, the number of employees reached 986, capable to soak 14,000 pieces of sheep and goat skins and 1300 pieces of hides per day. As a result, the tannery is not only the biggest in Ethiopia by utilizing 30 percent of the country's rawhides and skins fleshed and covered about 35 percent of the sector export market in Ethiopia (NBE, 2006), but also the largest in East Africa. The main products of the tannery are Crust hides and skins, Wet blue hides and skins, Pickled ship skin, Finished garment leather and Finished glove leather and Lining leather and finished shoe upper (ETSC, 2006)

The tanning process in the Ethiopian Tannery is the same as in the country's conventional way of producing leather using inorganic chemicals, and some of them are hazardous like Chromium and sulfides. Due to its nature of production, the tanning process produces huge amount of gas, solid and liquid wastes that has significant effect on the environment unless properly treated. At present, the tannery is certified with EMS based on ISO 14001 requirements to handle its environmental impact with the help of Ethiopian Cleaner Production Center (ECPC) (ETSC, 2005).

2.2. Strategy for Collecting and Analyzing Evidence

Document content and progressive analysis: content analysis of the ETSC's EMS document was made to extract information about what the tannery's EMS *"said it would do"*. It was guided by gap analysis techniques that employed using structured questionnaire to assess the EMS of the tannery. The employed gap analysis was an investigation aligned with the principle, good practices and criteria of ISO 14001:2004. The structured questionnaire is an adoption and adaptation of ISO 14001:2004 specifications clause by clause. The question will have a *'Yes'*, *'No'* or *'Not applicable'* answers. For *'Yes'* answers, evidence will be collected. For the *'No'* answers, a gap is identified and shows that part of a system failed to maintain the system. The content analysis is supplemented by progressive analysis. The progressive analysis assesses what the tannery can *"prove it has done"*. The progressive analysis consists of reviewing related material, documented and evidence observation. The document and records included were manuals, procedures, reports of monitoring, audit and surveillance, minute, signatures, certificate of

training and calibration, among others. Rather, evidences that are relevant and related to the strategy followed by the study to attain the specific objective in section 1.3 (motivation, designing phase, training and operational control), was thoroughly compared with what the tannery intended to do and contrast with ISO 14001: 2004 intention and implication.

Specifically, evidence for the start up phase was collected by in-depth interview from the key informant that was the EMR of the tannery EMS. In addition, the discussion focused on the drives of implementing ISO 14001 in the tannery. Observation, interview and record analysis are employed for how and what environmental impacts was identified, predicted and evaluated. Information about operational performance was obtained through the PDCA model using the baseline information and benchmarking criteria. Data was gathered in the subsystem of Raw Stock, Beam House process, Tanning, Post Tanning and Waste Treatment in relation to their respective baseline and benchmarks.

The operational performance of the tannery was assessed to analyze the overall consequence of significant environmental impact for the tannery activity. It was done separately for resource consumption (inputs) and production process. A structured checklist was employed to identify environmental aspects and their impact. An appropriately identified and assessed environmental aspect eases significant impact evaluation. A professional judgment was in use to assign scales and weights. Although incorporating value was a controversial technique, they were easy technique to understand the level of the actual and potential impact of the identified environmental aspect. They are best methods in priority setting for mitigation and giving objective criteria to plan, implement, monitor and evaluate.

In order to convey the data to valuable key performance indicators (KPI) and to transfer to consistent and comparable information, a five point Likert scale (1=lowest, 2= lower, 3= medium, 5=higher) was compounded to identify significant environmental impact (ISO: 1999; GETF, 2000; SAQI, 2002 and UNEP, 2002). The compounded result can ease prioritization of action. The results also enable to have a measurement that can be translated in to operational goal and target and to track the level of remedial effect remained.

Moreover, due to the absence of appropriate data and technological choice to forecast environmental impact (O' Riordinan, 1995) and the future cannot be predicted by extrapolating the past trend in complex process when human, production and environment interact (Cole,

1999); using such kind of option to assess a synergic effect of environmental aspect is the best alternative at hand to measure own or other performance objectively. In addition, the method is recommended when there is insufficient (incomparable and incomplete) data and / or high level of uncertainty (limited understanding of ecosystem). However, as stated in the above note, it required *"a clear understanding of assumptions made in the handling of data and its transformation into information and indicators for EMP"* (ISO, 1999: 8)(ISO, 1999; GETF, 2000; SAQI, 2002; and UNEP, 2002).

Data was collected from the employee of the tannery by using a semi structured questioner. The interview has two main parts that deal with awareness and training received and acquired perception and knowledge as the result of training received. The questions were directly relevant to ISO 14001: 2004 requirements and focused on the competence, training and awareness part of the standard. It is believed that the analysis would chiefly supplement the result obtained from content and progressive analysis of competence, training and awareness, specifically and the whole EMS, generally. A total of 14 employees response was gathered, of which four were WT leaders, one section head, one auditor, four experts and five on the ground level workers. It was aimed to gather at least 20 bottom line employees, but most of the request, that assured no need of their name, was not accepted by employees, due to insecurity feeling. However, the low level of respondent did not affect the purpose of the interview since the aim of the interview was to supplement the findings of content and progressive analysis of the competence, training and awareness section of the study. Employee fear by itself is an evidence for the low level of awareness of employee on the tannery EMS as compared to the standard requirement (ISO, 2004a).

The Nearby Community: Information from people's attitude, perception and relationship to the industry was gathered by means of interviews using a semi structured questionnaires. It was aimed to cover at least ten percent of household in the Edjersa Kebele(Dingegu Bekele P.A) of Lome Wereda. And, stratified proportionate random sampling technique was used for three *"Gote"*, which are *Bekele*, *Bissana Bekele* and *Mazoria* (the P.A.s Household Head record was served as sample framework). From 47 (about nine percent of the total population) administered questionnaires, proportionally in three "*Gote"*, 42 (89.4 percent) questionnaires were valid for the analysis. The questionnaire has four parts. Part one deals with socio-economic background of the

respondent household head with the family. The second and third parts cover health condition of the family and interaction with tannery activities respectively. The last part deals with perception on the EMS of the tannery. The supplementary information was collected from two Focus Group Discussion (FGD) from *Bekele* (eight participants) and *Bissana Bekele* (seven participants) *Gote's* separately. The selected participants were those who live in the area for more than 30 years in order to compare the externalities before and after the erection of the tannery. To contrast the result of the survey, information from Koka Health Center where most of the responses have got medical treatment was collected.

Stakeholder Analysis: It was aimed to investigate the existence of a strong support, influence and complementary effect of stakeholders with respect to the implementation of successful EMS based on ISO 14001 in tanning industry in Ethiopia. Information was explored from documents and in-depth interview of the key informants from stockholders. The key informants from stakeholders under investigation were pertinent officials of Federal E.P.A. (Head of Pollution Prevention Department), Regional State of Oromiya EPO (Pollution Prevention Expert), M.T.I (Head of Leather Desk), ELIA (Representative of the association), LLPTI (Head of Leather Technology Department), QSAE (Expert of Quality Promotion and Training Directorate), E.C.P.C (Deputy Manager of Environmental Service).

Based on the eclectic approach Vedeld (2004) and Bremmers *et al.* (2006), stakeholders on implementation of ISO 14001 in the leather industry were considered to categorize the stakes. The disposition right were measured the authority to permit or deny licenses, audit and monitoring environmental performance. Responsibility analysis focused on institutional mandate, dependencies for livelihood, economic interest, competitive advantage or skill i.e. power and resources to incentive or disincentive environmental performance. The strength of exclusion of rights was determined based on average weighted (1=No, 2=Partial and 3= Yes) cumulative value of the above attributes existence.

Thus, according to the score and theoretical definition, stakeholders were classified in to primary, intermediary and secondary scale. Then, based on their return (demand) that is communicated, the available human and financial resource vested to them and the potential effect of the provision of motivation to influence and support environmental stewardship of firms were also examined (i.e. by using the aforementioned method).

Microbiological and chemical analysis was made on the tannery liquid effluent. The result was aimed to validate and supplement result obtained in the progressive environmental programmes and significant impact analysis of the tannery production process as output measure. In addition, the analytical laboratory result served the same to abovementioned purpose for progressive analysis of the tannery operational control and impact on the nearby community. The wastewater sample drown manually as per UNIDO (2000) tannery effluent sample taking procedure. ISO (1994), FAO (1997), Clesceri *et al.* (1998) and SLTC (1998) testing methods were used for microbiological and chemical analysis.

Finally, an extensive literature review was examined using published and unpublished data to supplement the investigation. In addition, data was analyzed and presented using description, percentage, percentage change, proportional value, ratio, rank, table, matrix and figure.

CHAPTER THREE

3. Related Literature Review

3.1 Conceptual Related Literature Review

Ecocentrism and Technocentrism are the main opposite stretched ideologies or views toward human utilization of environment (O'Riordan, 1981 and Jones and Hollier, 2002). Within each domain, there are extreme stances that differ in their action, believe and stand or philosophy. The deep environmentalism, ecocentric, believes that mankind is one among the species of ecosystem and *anti-materialist* (Jones and Hollier, 2002). Ecotopian and follower of earth ethics as a moral behavior could be mentioned (Enger, 2002 and Owen *et al.*1998). They are denoted as a pessimist (Jones and Holliers, 2002) who follow utopianism that do not provide a realistic or scientific option for its implementation (Owen *et al.* 1998). From the technocentrism, *comucopian (interventionism)*, views environment is considered as economic and social advancement at any cost. So, they are denoted as optimist for they believe technology will provide the solution. Their view is demonstrated on '*Kruzenet Curve*'. It states, development will take care or reverses the environmental problem at its highest stage. However, all environmental degradations are not reversible, information is asymmetrical and the present problems are the result of the best high technology (Titenberg, 1998; White *et al.* 1998; Jones and Hollier, 2002 and Sterner, 2003).

The moderate stance of ecocentric, communalism, believed that society has the ability to cooperate and establish a small scale self reliance community based on *soft development.* Whereas, it's counter part accommodation argued for a continuous economic growth through the incorporation of environmental and social concern. But, there is no clear cut between these paradigms. An extensive accommodation can be communalist or vice versa (O'.Riordan, 1995 and Jones and Hollier, 2002). However, the main agreeable idea reached on the issue of environment and natural resource is that it accommodates a changing and multidisciplinary concern that encompasses natural and social sciences.

In 1972, a widely read book, *The Limit to Growth,* published. Ecocentric named it the *Blue Print for Survival* (O' Riordan, 1995). It was based on early computer simulation of pollution, population and resource use. It predicted the industrial society would be in deep trouble if ways

were not found to radically improve sound environmental quality. The energy crisis in 1973 and 1979, especially in USA, shocked a mass confidence in the continuity of industrial or consumer society. The growing evidence about pollution and toxic chemical created important ground for and lifted up the pessimist view. They argued that *prevention* is insufficient to conceptualize the problem human beings and the earth face. However, such sensitivity opposed all methods and failed to provide an acceptable means to overcome the problems. The problems include the rapid rise of energy demand and price, unemployment and poverty (Peanlke, 1989; O'Riorden, 1995; Mazmanian and Kraft, 1999 and Jones and Hollier, 2002).

Recently, at the junction between reluctant communalism and accommodation, a satisfier idea of sustainable development was borne. Its philosophical stance was derived from technocentrism that aimed the well being of human being through a modest reform. This includes a shift from exploitation to renewable and replenishable natural resource base. It incorporates the shift from economy driven growth to liberal and participatory development plan (Owen *et al.* 1998; Mazmanian and kraft, 1999 and Jones and Hollier, 2002).

There is a continuous debate about the source and subjectiveness of conceptual framework of sustainable development (Becker and Jahn, 1999 and Mazmanian and Kraft, 1999). It is not an imposition of environmental related concern and issue. Rather, it is rooted in the interaction and mediation of social practice and natural process. It tries to cope up with the fragmentation of different disciplines that address different aspect or variables separately but exist simultaneously. Therefore, it challenges basic assumptions, prevailing theories and methods of different discipline. It calls a holistic approach that operates on *open-end system* and *dynamic materials balance model.* This is a different view from reductionism. It works on a closed end system by controlling the intervening variables through assumption such as a linear material balance model (Burch, 1996; Callan and Thomas, 1996; Becker and Jahn, 1999 and Mazmanian and Kraft, 1999).

Sustainability has an implication on human liberty. The opponents argue on its principle of *not compromising future generation.* It implies that human future will be subjected to more restriction on personal freedom. The counter argument confirms that, if we do not start managing the environment sustainability, the opportunity will disappear one by one. Evidence showed that fishing is constrained in North Sea and Antarctic Ocean due to decimate of fish. It is unsafe to

swim in coastal area of industrial country due to pollution. Sustainable natural resource management place human as focal point. But, it requires a wise and better management. A proactive and preventive measure is feasible option to contain small environmental problem to be large (Marcus and Willing, 1997 and Jones and Hollier, 2002).

Different kinds of classification criteria exist in relation to concept and approach toward prevention of environmental quality (Mazmanidn and Kraft, 1999 and Jones and Hollier, 2002). The short term and long term strategies dichotomy is preferred in this analysis for an easy comparison. The short-term strategies are an *end-of-pipe* view towards the environment issue. Whereas, the long term strategies contains an attempts toward the inside approach that includes Voluntary Agreement (VA).

A VA is a level of prevention and abatement as beyond achieved autonomously. It is assumed that every one cleans up to the point of comfortable net gains. The VA requires more environmental sound practice above the limit. It uses negotiation, verification and contract agreement between regulation and polluters. For the effort of polluter to invest for good environmental practice, they receive subsidies or positive publication. It includes lenient or relaxed control. Voluntary agreements are most promising when the opportunity of getting technical abatement is good. It is a viable option when emission verification is very difficult due to low capacity. Otherwise, it is attractive in the condition where environment protecting agencies do not have sufficient power to intimidate the polluter. For instance, Chimney was subsidized to avoid in-house pollution but currently chimney with filter is an ordinary action. Brakes in car are no more specifications or safety items. So, a former *add on* eventually becomes ordinary operating cost. Chlorinated paper manufacturing was banned voluntarily in Sweden by industries (Wever, 1996; Bridgen, 1997 and Sterner, 2003).

Voluntary agreement can be divided into international and corporate level. The international corporation agreement aimed to attain equity, education and technology transfer on environmental issue as it synergized economy and political issue to environmental concern. The international voluntary agreement requires the collaborated effort of international agents. Agenda 21 is a comprehensive voluntary action plan subjected to guide all states to develop sustainably. Among others, Rio declaration, statement of forest principle, Montreal protocol and amendment

and the Keyoto Protocol could be mentioned as voluntary agreement. Almost all are strategic plan that need at least a formally signed treaty to be changed into action plan (Callan and Thomas, 1996 and Stermer, 2003).

The corporate level VA is composed of a wide range of business charter (Multinational and National), private initiatives and labeling schemes. Preventive strategy is considered as an important action for environmental protection through reconciling economic growth and environmental quality problem. The business charter, private initiative and some of labeling schemes are based on a self-autonomous compliance. Those who support the strategy argue that, there is no reason to distrust the compliance level to own labeling scheme if there is a provision of environmental protection from the national legislation. They suggested that other's evaluation mechanism may act as a protectionism which can hamper international trade and affect competitiveness (Callan and Thomas, 1996; ELTawil and Hammesistard, 2001 and Sterner, 2003).

The last corporate VA is a labeling scheme that a company applied for independent agencies for certification. The certification can be for product or process separately or with combination. A product certification is the oldest and rapidly growing scheme that includes organic certification and green labeling. It has known by the name *"Green Passport"* in international market. The life cycle assessment (LCA) is most scientific tool that deals with *cradle to grave* of product impact on environment, but, it is difficult to bring it from theory to practice. Environmental management system is another scheme that incorporates environment as priority to the management system of the organization. In this respect among others, Environment Management Total Quality System (EMTQS) and EMS based on ISO 14001 are the dominant schemes. These schemes are based on a proactive principle and an integrated approach to the issues of environment quality. They are a promising approach to look pollution before creation and in area where information gathering, interpreting and responding accordingly are costly or technically limited. However, their success can be complimented by voluntary adoption or sufficient provision and negotiation of environmental protection from legislative body, transparent and objective criteria of certification and consumer demand for green product (Zairi, 1996; Sterner, 2003; Wever, 1996 and Wainwright and Muleigan, 2004).

Among other schemes and EMS ISO 14000 series of tools, ISO 14001 is auditable and compliant standard. ISO embarked on creating standards that are not only based on practical experience and scientific knowledge but also enjoy general acceptance and recognition. Since, standard is best way of performing tasks or producing products. It is agreed through consensus between interested parties. Besides, the success of ISO 9000 led to the development of other standards. It is generally believed however that, the ISO 14000 series emerged as a result of both the Uruguay round of the General Agreement on Trade and Tariff (GATT) negotiations and the UN Rio Earth Summit on the environment held in 1992 which created a vital component of sustainable development that stressed in Agenda 21. Nevertheless, in 1991 ISO established Strategic Advisory Group on Environment (SAGE). SAGE contains members from 20 countries, 11 international organization and 106 environmental experts that prepared recommendation and strategic planning for developing international environmental standards. Finally, ISO/Technical Committee 207 (TC 207) Environmental Management was established in 1993 to carry out the duties laid during Earth Summit Business Council for Sustainable Development (Wever, 1996; Anewar, 2001a and Joseph and Nagendran, 2004).

According to Wever (1996) and Joseph and Nagendran (2004), TC 207 drain the experience of the major pioneer of EMS develop standards that can be traced to the British Standards Institute (BSI) publication of the three part quality series-BS 5750. The success of this standard led to the adoption of BS 7750, the first formal systematic and standardized approach to environmental management. The BS 7750 was published in 1992 and it was a voluntary management standard. Countries started to produce their own EMS. An initiative began regionally within the EU and the EMAS was negotiated with industry, environmental groups and other interested stakeholders within the environmental field. It was created for businesses interested in voluntary certification to an EMS within the EU. The increase in national standards on the environment compelled ISO to initiate moves on EM standards. Hence, TC 207 adapts the BS 7750 and developed ISO 14001 in 1996. The main purpose of ISO 14001 standard is to provide a systematic, documented, consistent procedure that provides clear evidence of the relationship between organization's publicly stated environmental policy and the implementation of this policy in practice. The standard specifies a "continuous, cyclical process" consisting of 17 elements.

The standard enables firms to internalize and deal with environment legislation based on avoidance and safety measure strategy. It is a recent and an adaptive management viewed as useful conceptual framework for defining ecosystem management. It follows, a what to do (Plan), how to do and doing it (Do), monitor and evaluate whether these state of managed system move closer to a desired objective or goal stated (Check). The feedback is used to facilitate adaptive learning for the betterment of the environment. A Plan Do Check Act (PDCA) is aimed for a continuous improvement. In ISO 14001, environmental priority will be considered with financial, technological and business priorities. It also promotes a common approach (generic) of implementation and registration requirement to reduce and avoid reputation of audit that might hinder trade due to disparities of specification (White *et al.* 1998; Mazmanian and Krafl, 1999; Amwar, 2001a; Anwar, 2001b; Sterner, 2003 and Wainwright and Mulligan, 2004).

EMS based on ISO 14001 is a system-oriented approach that recognizes component parts interacting with each other to fit together. System analysis helps to reduce complex reality to a consistent and manageable framework or sub system. The subsystems are connected by flows of causality, matter, energy or information for deep investigation and understanding. When a bit size pieces put up together, it gives the whole picture. But a system model is not simple. Even if measurement simplification is preferable (e.g. using yardstick or money), it might mislead to ignore the reassembling of the models and to look the whole reality (Burch, 1996; White *et al.* 1996 and Korhonen, 2005).

The reassembled whole notifies better than its parts. The standpoint is agreeable with the dynamic material balances model. The model recognizes the occurrence of economic decision and residual byproduct due to inefficiencies. In every aspect of resource utilization within the process, it believes for a customary investigation of a part or process the whole cannot provide a complete explanation of vital phenomena. Since the assumption of the non existence or kept constant of intervening parameter is misleading, it is plausible to infer that waste treatment can't tell environmental performance. Moreover, the summary of action treated in isolation of parts cannot reveal the properties and mode of action at higher or organizational level. Therefore, in order to know the whole in better accuracy, it is required to assemble (a custom of matching parts), analyze the components and coordinate the parts and processes. Because, it helps to have an informed environmental management and policies that give more than any philosophical

consideration to impulse an integrated study (Burch, 1996; White *et al.* 1998; Wainwright and Mulligan, 2004 and Korhonen, 2005).

In any system, a change is a constituent element. However, it requires a defined initial and final stage, of the system that helps to recognize the intermediate stage in sequence. When change is affected in such defined stage it causes a process. A cyclical process is formed when the effect of operation returns the system to its initial stage. This creates the casual relationship between the components. In cyclic and open system, maintenance of such structure of the organization is a critical attribute. As a result, the system doesn't have *status-quo* equilibrium. It will have a changing, adaptive and maintaining healthier equilibrium. The exchange of energy, matter and information in the process makes a steady state through maintenance and repair. In ISO 14001, the PDCA cycle is based on the aforementioned principle known as a *Deming Cycle*. It helps for continuous improvement of environmental performance. Therefore, EMS based on ISO 14001 is an integrated approach that provides a conceptual framework to the dynamic relationship between decision making and their impact. The feedbacks are the inertia for the betterment of environmental quality (Burch, 1996; Wever, 1996; White *et al.* 1998; Anwar, 2001a; Anwar , 2001b; Besterfield *et al.* 2001 and Korhonen, 2005).

EMS based on ISO 14001 is a management approach to the environment issue of the organization. A management approach emanates from performance criteria and their achievement. Proactive, prevention and precaution are effective tools in management for reducing risk. It might be our best stake when we should operate with limited knowledge. At present, it is difficult to represent the whole system of environment in laboratory or field due to cost and engineering limitation. Occurrence of risk is high when an operation is performed in information asymmetry circumstantial to and non-linear material balance mode. Prior actions must be designed to avoid or reduce the risk. Management, instead of controlling, is suited to minimize or maintain an action though adaptive management approach based on scientific experiment and adjustment. Such a root cause analysis enables the managers to avoid a room for ignorance that is dangerous. Incorporating ecological and preventive principles such as reduction at the source, reusing, recycling, recovering and controlling will pay later. The aforesaid action eradicates or minimizes the need to costly reclaiming activity (O'Riordan, 1995; Roger, 1997; ISO 2004b and QSAE, 2004a).

EMS based on ISO 14001 is an auditable standard that can be objectively evaluated. It enables to investigate and show how organization, management and equipment are performing in terms of environmental legislation and sound environmental practice. It tries to depict the levels of performance from the baseline. Operation performance will be compared from the benchmarking criteria. The standard required incorporating and monitoring of applicable environmental and other legal requirement as internal performance criteria. It emphasizes the analyses of resources consumption, likelihood of accident occurrence and the level of environmental risk for prevention and precaution measures. Therefore, the collaboration efforts enable the organization to look inward on pollution and/or natural resource utilization. The lesson learned will serve for the enhancement of the future plan (Amwar, 2001a; Jones and Hollier 2002; SAQI, 2002; ISO, 2004b and QSAE, 2004a).

EMS based on ISO 14001, like VA, works under the concept of the percent *add on* specification or method of enhancing performance, will become an eventual operating cost. It goes through a demonstrable cost, benefit, and risk. But, the EMS approach is not an *inspected into* the system that requires the need to strong quality control and sufficient information. Rather, it renders good result when it is complimented by strong environmental regulations (Callan and Thomas, 1996: Strener, 2003 and Gnnigham, 2007: 200-229). Therefore, it has to have a policy to establish the guiding principles of sound environmental action of the organization (ISO: 2004c and QSAE, 2004a). The top management of the organization is responsible to set, communicate and implement the policy. As described in Wever (1996:56), "*Where changes were made superficially, piecemeal and unsupported by high management commitment or cultural change, they tend to fail*".

The competitions of the firm rely on the policy. It is a stated framework and directive towards a proactive and preventive measure. These measures enhance the positive impact and reduce the adverse effects on environment through participation, communication and training. The abovementioned mechanism strengthens creativity of employee, sharing of responsibility by every line manager and individual worker as the success depends on them. Such collaboration aimed to create a sense of common identity with in each other on their mission, goal and value (Oliend *et al.* 1991; Sasseville *et al.* 1997 and ISO, 2004b).

Objective, target and program of the EMS (ISO, 2004) that stem from the policy are prepared, implemented and reviewed in every operational sub system. The whole system tries to optimize its part, which is known by *Parito development* or *win-win development*. It is an open-end collaboration in that someone benefits on no cost of the other (Burch, 1996; ISO 2004b; and Korhonen, 2005). Besides, EMS based on ISO 14001 is auditable standard that is generic and uniform standard. Therefore, it avoids repetition of different audits. If a third party who is accredited and acceptable by customers certifies it, it can enhance marketability. It has a trickle down effect to similar sectors. Evidence showed that environmental consideration as in aforementioned manner pays and enables to use endowed resource at maximum efficiency (Callan and Thomas, 1996; Wever; 1996 and Besterfield *et al.* 2001).

Different studies showed that the leather sector is identified as one of the great potential areas for the development of Ethiopia (Befekadu and Berihanu, 2000; UNCTAD, 2002; CSA, 2000; FAO, 2003; NBE, 2005 and MIE; 2005). Moreover, the sector is identified as the cause of a significant and potential environmental impact since it uses abundant, renewable and non renewable resource with different technology. The processing unit is characterized by a contagious effect (continuous causal relation ship) for the next process quality and its impact on environment (Thorstensee, 1993; WB, 1998; UNIDO, 2000; UNIDO, 2002;GE, 2001; ECPC; 2002; Petry *et al.* 2002; EPA, 2003 and UNIDO and EPA; 2003). As the sector's exportable product targeted to developed world market, it should cope up with the growing demand of ecofriendly product along with their technical specification is compulsory and chosen standards are favored by consumers (Lowson, 1999; GE, 2001; Khan, 2003; ETA, 2004 and Teshoma, 2004).

Therefore specifically assessment of EMS of these industries using tailored method of ISO 14001 is a timely activity to maintain the aforesaid benefits. In such assessment, investigation of one institution is a scientific option. It examines the way in which the organization has complied with the condition set in development consent document such as environmental policy or EMS manual (Jones and Hollier, 2002; ISO, 2004a and ISO, 2004d). However, scientific inquiry should be large enough to explain the problem significantly. It should be small and precise or workable during field investigation (Dawn, 2000). Ethiopian Tannery confirms such criteria, being the largest tannery in East Africa that covers 60 percent of the Ethiopian leather export (ETSC,

2004). Therefore, it is plausible to conclude that employing ISO 14001:2004 as conceptual framework and suitable to assess and show how the organization, management and equipment are performing in terms of sound environmental practice. Besides, in order to focus the research, critical strategies for successful implementation of EMS were selected from the whole 17 requirements of the above stated standard. As highlighted (shaded) in the following conceptual framework (Figure 1) adopted ISO (2004a) and adapted from aforesaid literature illustrates the focus of the study.

As illustrated in the schematic conceptual framework, the emphasized critical paths to sustainable environmental consideration were:

- Initial and sustained motivation: arising from internal and external drive (Callan and Thomas, 1996; Owen *et al.* 1998; Lowson, 1999; Yerenell, 1999; Adams, 2001; Bakker and Nijhof, 2002; Gbedemah, 2004; Wainwrght, 2004; Teshome, 2004 and Gunnighan, 2007: 200-229).
- Convenient environmental design: the use of the correct tool according to intended and implied aim of integration and linkage with the day-to-day life. It includes environmental aspect identification, significant impact analysis and EMP development (ISO: 1999; GETF, 2000; SAQI, 2002; UNEP, 2002 and Khan, 2003).
- Cultural building mechanisms: competence and trained personnel on significant environmental impact operation in order to prevent, control and avoid adverse effects on environment. Reputability and traceability of performed work (Wever, 1996; Besterfield *et al.* 2001 and ISO, 2004a).
- Stakeholder influence and support: right, responsibility, return and relationship among stakes (Callan and Thomas, 1996; Wilison and Sassivell, 1999; ISO, 2004a; Vedeld, 2004 Bremmers *et al.* 2006 and Gunnighan, 2007:200-229).

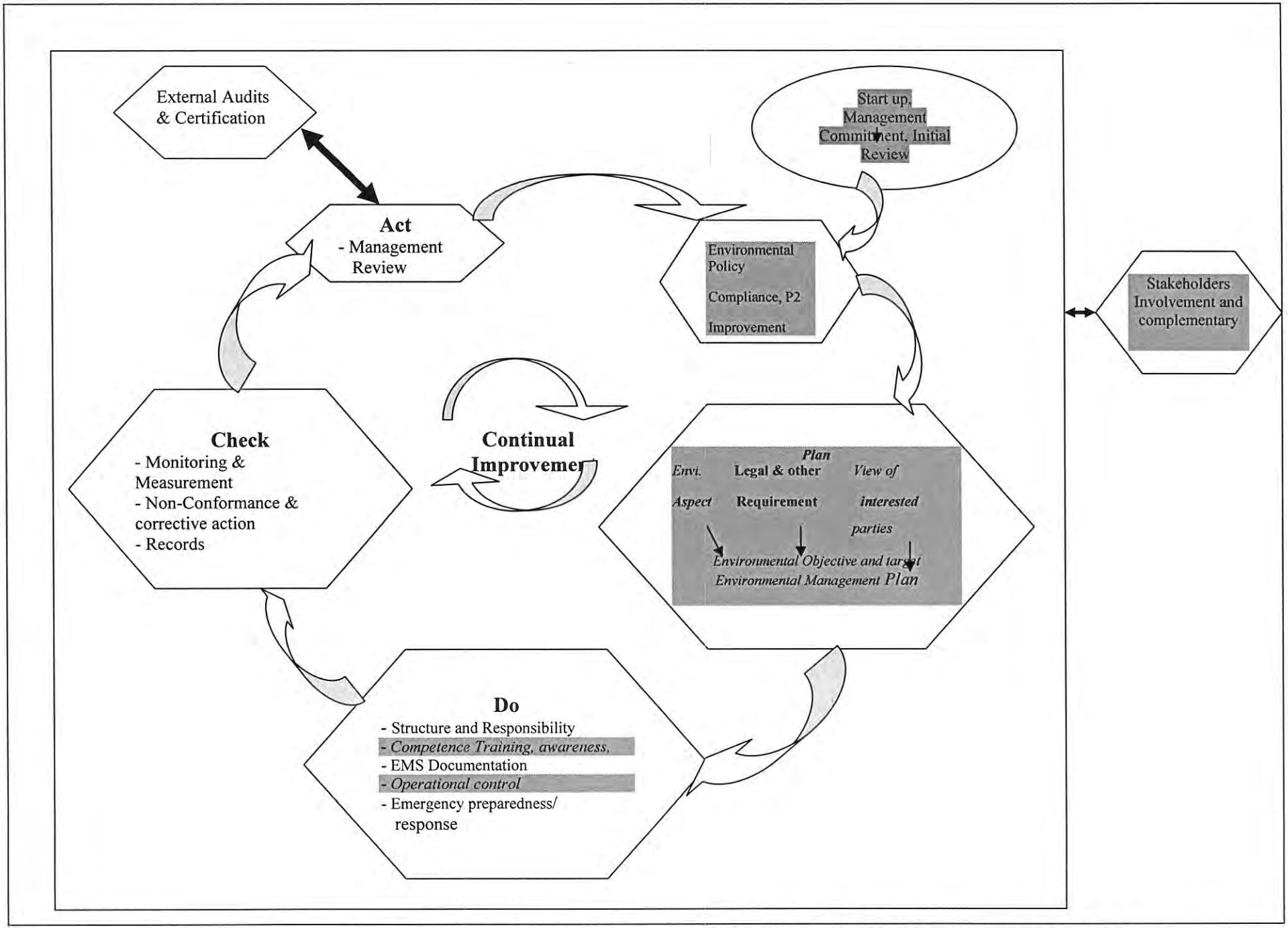


Fig 1. Schematic representation of EMS – PDCA Model (Adopted and Adapted from, ISO, 2004) i.e. highlighted elements are the study focus

All the terms used in this paper are complied with ISO 14001:2004. For instances the main terms are:

Environment: Surrounding in which an organization operates including air, water, land, natural resource, flora, fauna, human and their interaction (ISO, 2004a and ISO, 2004b).

Environment Impact: any change to the environment, whether adverse or beneficial, wholly or partly resulting from an organization's activities, products or services (ISO, 2004a and ISO, 2004b).

Environment performance: measurable results of the environmental management system, related to an organization control of its environmental aspect based on environmental policy, objectives and targets (ISO, 2004a and ISO, 2004b).

Environment management system (EMS): a systematic and documented verification process of objectively obtaining and evaluating organization's EMS that conform to audited criteria set by the organization and for communicating the results of this process to management (ISO, 2004a and ISO, 2004b).

Stakeholders: is defined to be any group of people organized or unorganized, who share a common interest or stake in a particular issue or system; they can be at any level or position in society, from global, national, regional concern and down to the level of household or even intera-household. The stake may originate from an institutional mandate, geographical proximity, historical/identity association, and dependence for livelihood, economic interest and a variety of other capacity and concerns (Woodcock, 2002 cited in Vendeld, 2004: 9).

Leather industry: includes all aspects of tanning and finishing as well as production of finished products made from leather. Accordingly, the industry is pictured as consisting three stages. These include the production of raw materials, the transformation of these materials into various types of leather and the manufacture of finished product (FAO/WB, 1996).

3.2 Empirical Related Literatures Review.

In the mid 1920's, foreigners started modern tanning activity in Ethiopia. Currently, there are 24 tanneries, which are operational in the manufacturing sector employing around 6000 workers that is (8 percent) next to food and beverage (29 percent) and textile (26 percent) (CSA, 2003; ETA, 2004) of the total employment in the industry sector of the country (CSA, 2003). However, 12 out of 24 tanneries were established between 1994 to 2006 (MTI, 2006), which is an evidence of a considerable shift of the location of the tanneries and leather manufacturing industries to developing countries. The reason is not only the *'natural'* shift of industry from North to South to

seek lower production cost and the activity has become a routine one, but also the result of push of growing environmental concerns, rules and regulations to less stringent environmental regulation in developing states (WB, 1999).

Ethiopia is one of the largest countries in the world for its livestock resource and indeed the largest in Africa, which is a reliable and renewable source of raw material for the leather industry. This industry is playing a significant role in generating foreign currency and employment opportunity (Befekadu and Berehanu, 2000; CSA 2003; EPA, 2003 and FAO, 2003). For instance, the sector is the leading manufacturing sector in the export market that covers an average of 67 percent of semi processed and finished product. The main export destination for leather industries are Europe, USA, Canada, Japan, the Far East and the Middle East (NBE, 2003; ETA, 2004 and NBE, 2006). In developed world market, there is a growing demand of ecofriendly product. For instance, EC banned Indian leather product mainly to this fact (GE, 2001).

Ethiopia's hides and skins are preferred as to their natural quality of clarity, flexibility, strength, thickness and its compact nature. They are suitable for the production of high quality dresses, gloves and garments. Therefore, they are greatly demanded in international market. Specially, Ethiopian goat skins are classified as *'Bati- genuine'*, the international name for high quality goat skin, coined from Province of Bati in Ethiopia, which is suitable for fashion products in international market (ETA, 2004).

However, the studies of WB (1998) and UNIDO (2000) indicates leather industries throughout the world are closely associated with high level of natural resources consumption and generating hazardous pollutants and hence led to negative public image. Tamiru (2004) confirmes that, the increment of chromium content of river water below ELECO Awash Tannery is the result of the effluent discharge from the tannery. The study associates the discharge of the rising level of chromium content on vegetable products irrigated through polluted water. Hence, the importance of Quality Control and EMS in the leather sector led to high quality standard requirements by developed countries (Issayas, 2003 and Tesfaye, 2004). Teshome Kebede (2004) on his essay,

Preparing Leather Industry on Indispensable Challenge, also indicates the strict terms and condition of trade related to issues like environment and working conditions. Moreover, countries have become more conscious on environmental issue by creating *no-room* for polluters. The studies recommended that there is a strong demand of national economy to be developed using endowment of leather sector (Tesfaye, 2004 and Teshome, 2004). But the notions of environmental consideration in tanneries are not an option, rather the only choice.

The Ethiopian government strongly affirmed the existence of conducive investment environment for export led industries especially for leather industry (MTI, 2005). As a result, the leather industry has gained enormous potential and opportunity for development. However, Ethiopia has not yet benefited much from the sector. Some of the reasons identified were traditional way of rearing animals that focused on quantity rather than quality, less disease and pest control, slaughtering problems and inefficient local consumption which all deteriorate the quantity and quality of leather products (Yohanes, 1996 and Arbei, 2004). The low level of development resulted to low level of meat consumption that inturn led to lowest off-rate (Belachew, 2004). Besides, lack of proper strategy for the sectors (ETA, 2004) and exporting semi-processed products instead of finished one (NBE, 2003 and Teshome, 2004).

On the other hand, Ethiopian Cleaner Production Center (ECPC) (2002) studied the cleaner production (CP) of ELECO Awash and Mojjo tanneries in the year 2000 and 2001, respectively. The study used monetary value to evaluate the benefit that arises from focal point of CP implementation that could save water, chemical and beam house operation with little consideration on among others recycling, reusing, equipment modification, housekeeping, process optimization. As a result, implementation of CP generates a considerable and encouraging quality, financial and environmental benefit. For instance, ELECO and Mojjo annually save 16,668.90 and 97,894, Birr respectively (ECPC, 2002). Even if the lack of confidence on new method is exhibited (ECPC, 2002), environmental considerations can pay later. Hussien (2004) supports this idea by arguing that environmental fitness enables the sector to be exploited in full scale (ECPC, 2002 and Hussien, 2004). The World Bank (2001) report clearly revealed that Foreign Direct Investment (FDI) flow and insurance coverage kept their

pace with the country with good environmental concern in general and with good environmental performing sector in particular (WB, 2001; Khan, 2003 and ETA, 2004).

Hussien noted that the Ethiopian government is working to introduce Environmental Management System (EMS) in this sector (Hussein, 2004). Hence, environmental policy, regulation and pollution prevention mechanisms were in place. Strictly speaking, none of the aforementioned studies assessed environmental performance using environmental management specification that based on ISO 14001. The standard has a Plan-Do- Check - Act model for continues improvement. It enables to deal with environmental issues from *'cradle to grave'* with in the tannery. Therefore, this study will fill this gap by investigating the existing status of Ethiopian Tannery and pinpoint the improvement required by leather industry. Next, the discussion on the results of ETSC's EMS assessment will be provided.

CHAPTER FOUR

4. Result and Discussion

Generally, the purpose of this study was to assess how the organization, management and equipment of the Ethiopian Tannery Share Company (ETSC) perform with respect to EMS based on ISO 14001:2004. First, it was sought to explore why and how the tannery introduced EMS based on ISO 14001:2004. Second, it was intended to investigate the level of compliance of the tannery EMS visa-a-vis the environmental planning. Because, as indicated in Wever (1996) and Sasseville *et al.* (1999), Sterner (2003), Wainwright and Mulligan (2004), the planning phase of EMS is a means to establish a base for building all other elements of the system. It enables to indicate the EMS approach to integrate environmental consideration into the organization culture. Moreover, it enables to identify as how the planning is made easier to have real environmental focuses in day-to-day activities. Besides, it is a foundation to maintain and continually improve the implemented EMS through the provision of measurable feedbacks (Wever, 1996; Burch, 1996; Sasseville *et al.*1997; White, 1998; Anwar, 2001a, and Anwar, 2001b). Third, it was aimed at identifying the challenge and strategy associated with the competence, training and awareness section of the implementation phase in EMS. Such investigation enables to enlighten the level of workers towards common understanding on the tannery's environmental policy attained as a result of the intervention (EMS). Finally, it intended to assess how the implemented pollution prevention activity brought change. It focused on house keeping, input reduction (water and Trivalent Chromium), avoidance of unecofriendly input and efficient resource utilization.

In the next section of this chapter, it is deliberated on the description and motivation of ETSC'S EMS. This section also discuses environmental design part of the tannery EMS by comparing and contrasting with ISO 14001:2004 specifications and its links with sustainability and social responsibility. Besides, the result of document analysis and interview on employee competence, training and awareness are also highlighted in this part. Finally, the last section contains the analysis of level of pollution prevention in the tannery.

4.1 Motivations and Description of the Tannery's EMS

4.1.1 Opportunity and Resources of ETSC

ETSC is equipped with a proper industrial layout to process hides and skins from semi-finished to finished products. It has its own water treatment plant and primary and secondary effluent treatment plant (observation). It is established in an area of 650,000 square meters and one quarter of the total area covered by infrastructure such as stores, beam house, tanning and post tanning section and water and effluent treatment plant. As one of the factories in the leather sector in the country, ETSC is under the challenge of developed world supply chain management (ETA, 2004).

By contrast, for instance, ELECO Awash Tannery, the largest private and ISO 14001: 2004 certified, invested Ethiopian Birr Eight million to build effluent treatment plant in the year 2003 (ECPC, 2005). ELECO Awash is located in Kality Akaki sub city, south of Addis Ababa, was required to pay Birr 42 up to150 per squaremeter for further expansion (www.addisababa.adm.org). It is located in city where resident are densely populated and vocal (Gilbert and Guger, 1992). Therefore, ETSC free from the abovementioned threat. Hence, the tannery has an opportunity and the most favorable circumstance to boost its competitiveness (Owen *et al.* 1998 and Lowson, 1999; Khan, 2003; Teshome, 2004 and Hontou *et al.* 2006) by minimizing its cost for facilitating the implementation of ISO 14001:2004.

On the other hand, as compared to ELECO Awash Tannery and Dashen Brewery Share Company (DBSC), ETSC lacks an opportunity gained from implementing EMS compatible activities such as cleaner production and QMS based on ISO 9001. ETSC and ELECO Awash Tannery started implementing ISO 14001 with the help of ECPC at the same time (ECPC, 2005). However, ELECO Awash Tannery has developed a cleaner production in the year 2000. It gained an experience from implementing prevention of pollution strategy that focused on house keeping and reduction of resource consumption (water and electricity). The monetary value of saved resources was Birr 16, 668.90 (ECPC, 2000). Moreover, DBSC has been certified in QMS based on ISO 9001 in 2003 being the first industry in Ethiopia (ECPC, 2005). DBSC enjoyed by utilizing the opportunity created from compatible feature and experience of ISO 9001 and ISO 14001. Among others, the features include policy statement, management commitment, Plan Do Check Act (PDCA), cycle for continual improvement, system and operational control,

communication with stakeholder, awareness training and competence of employee internal audit and document control (Besterfield *et al.* 2001 and ISO, 2004a).

The lack of the aforementioned experience clearly indicated that EMS of ETSC started from reinventing the major wheel to develop and drive a newly proactive environmental management system. This implies that the EMS of ETSC lacks an opportunity to concentrate and reevaluate the usefulness of existing sound environmental practice and system based approach. As a result, it has a challenge to obtain an effective and efficient EMS. Hence, the tannery might require a lot of effort to offset the challenge associated with implementing effective and efficient EMS. The proceeding section, therefore, tries to describe the aforesaid opportunity of ETSC on why and how EMS was developed.

4.1.2 Motivation of EMS of the Tannery

The primarily impetus for introducing EMS, based on ISO 14001 in the tannery, came from ECPC, an outside source. The dialogue between ETSC and ECPC was held between September 2003 to November 2003. ECPC nominated ETSC as one of the eight companies to implement ISO 14001 in Ethiopia. According to the EMR, the hurdles launched from ETSC's top management during the discussion were:

- Why should we be advised to implement EMS despite having primary and secondary effluent treatment plants since establishment; while others operating without it? We already have programs to treat our waste. We are doing our best.
- Why should we incur additional cost for environmental consideration?
- It is not a regulatory requirement. We will do it if others are required to, or what is the benefit of doing it?

However, in late November, 2003, a consensus has been reached between ETSC and ECPC to implement EMS based on ISO 14001. Hence, ETSC agreed to allocate human and financial resources and ECPC on its part agreed to provide consultation, surveillance and audit service of ISO 14001 implementation and promised to cover the certification fees secured from the UNIDO.

Prior to the consensus, there was no environmental department or personnel responsible for environmental activities in the tannery. On the contrary, different literatures showed that firms

that are linked to developed world market were influenced to have their own Environmental personnel in Environmental, Marketing Department, top management and/or Research and Development Department to handle the concern (Wilson and Sassivelle, 1999 and Konrad, 2005). Ironically, such commitments are minimal in ETSC. Thus, the tannery was mostly forced to rely on the knowledge and skill provided by the ECPC who did not have experience on the matter (ECPC, 2005).

The second motive of endorsing EMS based on ISO 14001 was aroused from the acquired knowledge of ISO 14001 by a number top management. According to the tannery EMR, after the tannery's top management discussion with ECPC, they conceived ISO 14001 certification as green passport in developed world producers' supply chain strategy. The result obtained during the discussion with the EMR confirmed the existence of the influence of supply chain strategy. According to the respondent, almost eight years ago ETSC received complaint from Mercedes Benz Company, a German based car manufacturer. The latter claimed that the ETSC sold DDT (Diphenyl Diethyl Tetrachlorether) preserved leather for its usage to automobile chair.

ETSC found that the raw material provider used DDT to preserve raw hides and skins instead of florinated salt. As a result, the tannery lost a valuable customer. According to the EMR, the customers demand in export market (a competitive drive) was the second impetus to implement a proactive environmental management that arised from external drive. The aforesaid competitive drive is known for its effective and continuous influence (Callan and Thomas, 1996; Wever, 1996 and Bestefield *et al.* 2001). Therefore, the tannery's EMS is motivated from one powerful external driver.

The third and last impetus for introducing ISO 14001 in ETSC came from the knowledge of top management acquired from participation on preparation of draft pollution load of industry in late 2004. According to the EMR, they regard implementing ISO 14001 as an opportunity to comply with the regulation after its endorsement. However, the country's legislative body did not endorse the law until April 2007. As indicated in different studies, the existence of legal liability can complement and motivate for implementing ISO 14001(Callen and Thomas, 1996; Sterner 2003 and Gunnigham, 2007: 200-229). The influence exerted by the constitutional right of the nearby community (EFDR, 1995), the country's prevailing environmental rule and regulation (FNG,

2002a and FNG, 2002b) could not play a significant role in the motivation and/or decision to introduce ISO 14001 in the ETSC. Hence, the tannery's EMS lacks the majority of sustainable impetus for successful implementation. According to Yernell (1999), the combined effects of all the abovementioned drives call for the need to be proactive, provide leading-edge service and to be sensitive to public concern. Yerenell (1999) argued that the stated values embrace team work, innovation and creativity, sensitivity to stakeholders, and flexibility and eagerness to change.

Different studies on the promotion and implementation of ISO 14001 recognized the combined effects of the motives aforementioned as necessary preconditions for a successful proactive environmental management (Yerenell, 1999; Callan and Thomas, 1996; Wainwrght, 2004 and Gunnighan, 2007: 201). Therefore, the absence of key motives such as absence of enforcement of a command control type regulation, lack of environment and legal liability, absence of environmental personnel or department in ETSC and lack of tangible incentives of line ministries resulted in absence of full-fledged preconditions that can force the proactive environmental management system in the right direction. This implies that ETSC's ISO 14001 startup phase was challenged by the lack of impetuses to "*Walk the Walk*" or subject for question of sustainability of the action.

Moreover, as insufficient motivation leads to a defective implementation then the whole effort is to no avail. Besides, it might incur additional fatigue and challenge for the diffusion of the system within and/or outside the firm. It can also block the chance to cheer up with the advantage gained by a successful implementation of ISO 14001. Nevertheless, this does not mean that EMS based on ISO 14001 is unattainable. Rather, it is not industrial tourism, visiting a tannery or company operation and looking around or having informal discussion but objectives for system evaluation (Marcus and Willing, 1997; Sassevelle *et al.* 1997 and Willson and Sassenille, 1999). The result would suggest that the start up phase of the tannery's EMS was subjected to either of the aforementioned defects.

So, EMS should begin with its basic thought of sustainable development, which is a result of merging the focus of sustainable developer and ecologist (O'Riord, 1975 and Diamond, 1997). And it is a systematic approach (Brunch, 1996) that narrows the gap of inefficiency and demands a continuous commitment of concerned bodies (Jones and Hollier, 2002). Our level of awareness

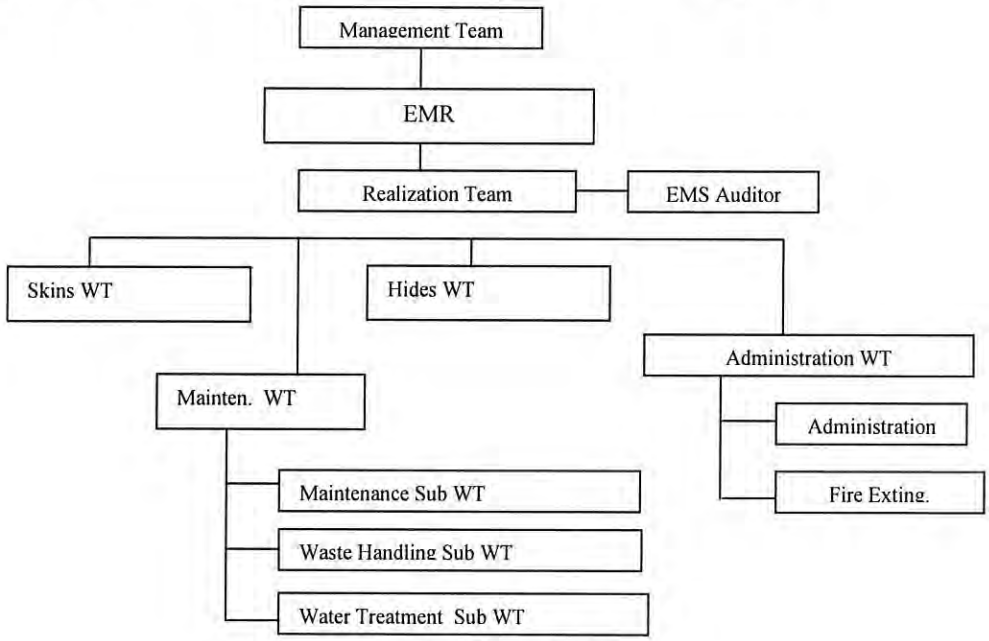
toward interrelation-ship between human action and environment must adopt the following, as Rogers (1997: 9) clearly puts:

> We must adopt what one author calls' cathedral thinking'. This concept explains the heroitic efforts that built the great cathedrals of Europe, and the generation of planners and builders who had no hope of seeing the finished product of their life work. Our mission is to envision a better future, and to leave the next generation one stem closer to its realization.

Lacking such thinking might be the cause of the deficiency that led to improperly addressing the EMS. The next subsection, therefore, a description of ETSC's EMS at initial time is highlighted.

4.1.3 Description of the ETSC's EMS Initial Phase

According to the EMR, a key informant, based on the above mentioned agreement, ECPC trained 45 personnel of ETSC on ISO 14001 for three days. The trainees were management members, department head and technical experts. Following the training, the top management assigned Environment Management Representatives (EMR), who was the Deputy General Manager of the tannery. The EMR with the management team prepared the environmental policy of the tannery and the organogram of the EMS through the modification of the existing structure. Then, the EMR and realization team assigned duties and responsibilities for each unit Working Team (WT). As illustrated in Figure 2, the units were Skin, Hides, Maintenance and Administration. The working team of each group was divided in to sub working team.



Source: ETSC' EMS Manual (2005)

Figure 2: Organizational Structure of the ETCS's EMS

As indicated in the discussion with the EMR, the assigned and performed duties were gap analysis between the existed tannery system and ISO 14001 specification, input-output analysis what they call it 'material balance' for Skins and Hides Production Unit. They also developed Environmental Management Manual on January 2005 after amending it three times. The manual was entitled "Ethiopian Tannery Share Company Environmental Management Manual and Standard Operation Procedure". Based on the manual, every unit identified environmental aspect, of their activity with associated impact. After analyzing the significant impact of the identified aspects, environmental objective was prepared and the target was set. The result was in harmony with view of the interviews that were conducted with four team leaders and five experts. At this point, document and interview results clearly indicated that the participation level of involved personnel on the aforesaid duties was excellent. Finally, on January 21, 2005, the General Manager of the tannery declared the tannery environmental policy and approved the manual. The start up and planning phase of the ETSC's EMS took almost one and half year.

ISO 14001 specification requires the delegation of member of the top management as EMR who is responsible for the implementation of the EMS. Because, it enables to ease commutation between the top management and the implementation team and facilitate resource (financial and human) allocation. Without top management leadership, a successful EMS implementation is not possible (Sasseville *et al.* 1997; Lowson, 1999 and ISO, 2004a). In this respect, the ETSC delegated EMR and the top management approval resulted in the environmental policy in line with the standard requirement. Moreover, as indicated in the guide standard, ISO 14004:2004, the structural development of the tannery's EMS was in terms with the organizations that build on existing organizational process and procedures which are more successful than those created new structure and responsibility. Hence, the tannery's EMS has the necessary inertia that could lead to a successful implementation. However, the above stated accomplishments are not sufficient to guarantee the success of EMS as EMS is a continuous effort to attain environmental target rather than simple documentation.

For instance, a number of different literatures suggested that EMS implementation could be done by environmental department. Otherwise, responsibilities can be delegated through the structure with reducing delegable routine duties to experts from EMR to bottom Sub Working Team Leaders. Here, delegation of duties to capable experts made the EMR and leaders free to concentrate on their effort to advise the implementer, reduce redundancy and improve

communication throughout the organization (Yerenell, 1999; Wilson and Sassivelle, 1999; GETF, 2000 and ISO, 2004b). As compared to the above delegation of work, to assignment of responsibility and favorable conditions, the findings obtained from the ETSC's EMS are subjected to non-conformance. In this regard, one of the team members has the following to say:

> We know the advantage of EMS and that is why we are committed to work the job in night at our home without payment. Our duties kept getting bigger production, quality system, and EMS.

The result obtained from abovementioned respondent goes in line with the findings of content analysis of the tannery's EMS document.

Thus, the time allocated for WT was minimal or insufficient that is consistent with firms that do not integrate the system with their day to day life (GETF, 2001). The tannery's EMS leaders trapped to their former duties or were not fully involved in regular communication about the progress of EMS. This could suggest that the EMS also lacks evidence to convince its employees and stakeholders that EMS is a priority more by their deeds than their words.

The EMR, the realization team and the leader of working team are pivotal for the success of EMS implementation and its program. Their function should include an advisory capacity, developing environmental program, providing guidance and leadership for employees when they are addressing the requirements. To carry out these responsibilities, the implementation team needs in-depth training on EMS to ensure a clear understanding of the intent of EMS and how each element can help a proactive environmental management (Sasseville et. al, 1997; Lowson, 1999 and GETF, 2000). As compared to the abovementioned aim of training, the ETSC's 45 personnel trained for three days by ECPC were insufficient and led to produce an EMS manual after three times amendment. Hence, the tannery's EMS startup and pre planning phase appeared to start from the scratch and contains a considerable source of deficiency. Its consequence was more time taking as EMS manual of the tannery is amended three times. The pros and cons of the above stated deficiency or shortcoming would be examined in detail in the next part of this study.

After the implementation of EMS that started through policy approval on January 21, 2005, the tannery was certified on its EMS based on ISO 14001: 2004 on March 2005. The certifier body was ETA, an environmental consulting Ltd, "The first accredited verifier in Austria" (ECPC, 2005). Next, on July 2005, the tannery was subjected to management contract based on agreement reached between Ethiopian Privatization Agency and Pittards, World Class Leather.

Pittards, World Class Leather is a British based company known for its high Quality glove and leather article (World Leather, 2006). In the next section, the planning part of the EMS with its progressive analysis will be dealt in-depth.

4.2 Design Phase of the Tannery's EMS

This section deals with content and progressive analysis of the tannery's EMS documents that focused on environmental policy and Environmental Management Program (EMP). The analysis enabled to acquire relevant information by comparing and contrasting the principles and specification of ISO 14001:2004. The documents under review were environmental policy, EMS Manual and EMP of the ETSC. The results shade light on the comprehensiveness of the policy to bind every part of the tannery to one common mission, environmental stewardship. The focal points of discussions were the incorporation of the nature and scale of the tannery activity and embodied the tannery to be committed to compliance with laws and applicable requirement, prevention of pollution; and continual improvement.

The analyses also look in-depth assess on how the tannery environmental aspect is identified, evaluated and most significant impacts were predicted. It also assessed the linkage of the aforementioned activity with the environmental policy and EMP. As a result, it becomes evident that the exploration insured the existence of linkage between the content of environmental document and their prevailing respective activity at the ETSC.

4.2.1 ETSC's Environmental Policy

4.2.1.1 Content Analysis

The policy approved on January 21, 2005 describes that the tannery was committed to comply continuously and to reduce adverse effects of its activity and keep the safety of its employee; comply with national and international regulations and communicate it with employees and stakeholders; and serve as the basis of formulating environmental objective, setting target and planning EMP.

The policy contains an announcement to the public *"do not hesitate to contact environmental management representative"*, if need arises. It contains a declaration that indicates the environmental policy will be evaluated and documented annually. It also gives a guideline that

makes possible to revise the environmental policy before the due date if a specific situation obliged to do so. But, the policy contains an obligation of the amended environmental policy to be communicated to stakeholders. As indicated in ISO 14001:2004 specifications, the environmental policy of the tannery satisfies the first requirement of environmental policy required in EMS based on ISO, 14001development and implementation. The general manager approval of the environmental policy and the delegation of one top manager as EMR was in harmony with the standard requirement that aim to facilitate information flow and financial and human resource allocation. As a result, the tannery's environmental policy could bind a collaborative sub-systems of the tannery and capable to be competitive and bring a win-win development, if it guides proper strategy.

As compared to the intention of standard (ISO, 2004a and ISO, 2004b) and different literature (Burch, 1996; Wever, 1996; Wilson and Sassivelle, 1999; Stapltone, 2001; ISO 2004a; ISO 2004b and Gunnigham, 2007), the environmental policy contains clearly two pillars committed to comply and continuously improve from the perspective of three pillars. Thus, the tannery's environmental policy did not clearly direct how EMS strives toward the hierarchy of prevention of pollution strategies i.e. the third pillar. The required clue might include minimizing resource consumption such as water, energy and chemical and controlling of hazardous pollutants to water, land and air. As a result, the environmental policy of the tannery does not contain the declared intention that provides the mechanism to narrow down broader long-term policy commitment. And the environmental policy lacks to provide a framework for significant impact analysis and preparation of EMP. Therefore, the policy did not sufficiently contain its intention toward the very core of EMS that direct to preventive and proactive measures. The policy lacks to guide the feedback mechanism that held the system to maintain the achievement and to strive for continual improvement.

Besides, as compared to the aforementioned standard requirements, the environmental policy of the tannery lacks directives that indicate how competence, training and awareness of employee could be facilitated. This is an inconsistence with the standard (ISO, 2004a and ISO, 2004b) that stressed on cultural change (common vision on environment) and building of competence of the worker. Hence, the environmental policy of the tannery mentioned nothing about issues that should collaborates the tannery's activities towards achieving common goals in terms of

environmental performance. In addition, it does not guide for the development of strategy to prevent, optimize and control significant impact of the tannery. This implies that, the policy might not be sufficient enough as it did not contain the guides that drive activities in the right track and/or not able to provide an integrated mechanism in the day-to-day activity of the tannery. Consequently, the whole EMS could not provide evidence that contain or guide the moral and ethical considerations, environmental stewardship or social responsibility to convince internal and external stakeholders.

4.2.1.2 Progressive Analysis

I. Internal and External Communication: According to the EMR and document review after declaration of the environmental policy, the realization team and the EMR started communicating the policy for the tannery's employee. The method of communication was announcing to employees during meeting at department and organizational level. The environmental policy of the tannery also communicated in environmental policy awareness and emergency preparedness training given for tannery's workers. The result was consistent with the findings obtained from the interview of member of the Realization Team. The Amharic version of the policy is posted at right hand side of the tannery's main gate and on the wall of the building where employee punch their attendance. The location and position of poster was visible. The results obtained are consistent with the abovementioned standard requirement and interview result on competence, training and awareness of the employee.

Different studies agreed on an effectively communicated environmental policy that could integrate employee to common mission for bringing change. Because, worker's participation can encourage, built confidence and make them part of the EMS. Besides, a successful EMS depends on employee input, involvement, understanding and by their service at every level of the organization as they are in the frontline. Moreover, it is requires a multidirectional information flow (top-down, bottom-up and across the function) and utilized all means of communication at hand. The above stated effort should be followed by evaluation of the attained level of employee awareness and understanding from time to time (Burch, 1996; Brideng, 1997; Sassivelle *et al.*1997; Yerenell, 1999, Steplaton, 2001 and ISO, 2004b). In this respect, the tannery's internal communication was similar to top-down approach of awareness creation program, department meeting and poster advertisement. The effect of internal communication was not evaluated for the

change it brought to worker's day-to-day activity. Moreover, there is no evidence about other means of dissemination of information about the environmental policy, its normative implication and objective goal such as brochure, wallet size notes and T-shirt.

Therefore, it is not known what environmental policy means to workers, how it guides their daily activity. This could suggest that the internal communication of tannery's environmental policy is at starting stage to create belongingness of employee that can affect the implementation of environmental program. Besides, it could be a potential area of improvement for the policy to be a thoughtful guide for EMS implementation that could serve as a unifying bond for competitiveness of the organization.

As compared to the abovementioned literature and activity of internal communication, the external communication of the tannery's environmental policy seems weak and reactively responding. The only proactive external communication was the recent environmental forum. The forum was held on March 8, 2007 in the tannery. The motto of the forum was *"Lets Work Together!! For the environment"* (ETSC, 2007). From the invited, the participated stakeholders included representatives of Federal EPA and Oromiya EPO, raw hides suppliers, Water Action Aid [NGO]; Addis Ababa University, Environmental Engineering Department and IDR (who conducted this study). Moreover, the Development Agents who work in Edjerssa P.A. Agriculture and Rural Development Office also participated. Therefore, the tannery environmental policy and its external communication did not enable the tannery's EMS to acquire stakeholder concern, which is required as an input for environmental significant impact analysis. This could suggest that, the result of significant impact analysis (i.e. an input for EMP) may not be in terms with the stakeholder interest, specifically the nearby community. Since, the nearby community is the primary taker of negative externalities of the tannery and has constitutional right to live in clean place (FDRE, 1995). Besides, the environmental policy of the tannery also declares to comply with this regulation. The result of progressive analysis of external communication showed that the tannery's environmental policy did not guide an imaginary incorporation of external interest that could erode public confidence. This implies that the tannery's EMS lacks a mechanism to absorb valuable inputs that can build external confidence.

In the mean time, the aforementioned environmental forum held on March 8, 2007 with stakeholders helped the tannery to announce the replacement of the pervious policy by new. The previous policy, which was a basis for the above analysis, was amended after two years. But, the program for amendment was one year that was too short for policy statement revision (Bruch, 1996 and Sassivelle et. al, 1997). By contrast, the new environmental policy (Annex B) was an integrated policy rather than the pervious stand-alone policy. It was endorsed after, almost one and half year, the tannery subjected to managerial contract with Pittards, World Class Leather. It incorporated the future business plan of the tannery. It states:

> The company is improving its managerial and technological capacity in order to reach the level of 100% finished leather production which is environmental friendly for export and domestic market. . . maximize value added exportable products through compiling with the national and international relevant legal and other requirement' (ETSC, 2007:1).

The new policy was consistent with the Master Plan of leather sector of the country that aimed to reach a full finished product export on December 2008 (MTI, 2006).

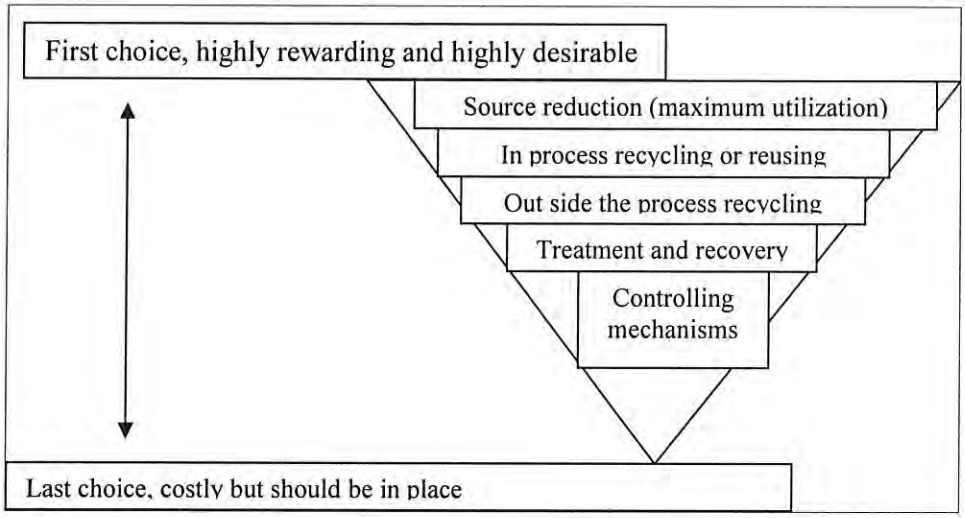
Among others, the new policy gave guiding statement to review *'all organization activity'* for effective control and prevention of pollution, utilize the resource *'effectively'* and train the employee regularly about its environmental policy, *'all environmental aspect'*, maintaining and improving the environmental performance 'in general' (ETSC, 2007) (Owen emphasis). The last phrase contains guiding statement that served as a means to incorporate training need assessment, responsibility, procedure and format in the amended EMS manual, which should be implemented. The results of content analysis of the new environmental policy showed that the new policy includes a better guiding statement and principle than the pervious one, in general. However, the analysis also affirmed that the new policy is similar with the previous one that mentions nothing to incorporate the unique nature of the tannery environmental aspect to guide environmental significant impact analysis. In addition, the phrases that has given emphasis (*Italicize*) in the citation of the abovementioned new policy, such as *'all aspect'* and *'effectively'* is vague and not explicit enough to be measured. Therefore, it might bring a comprehension problem during implementation and performance evaluation. For instance, what are the bases of effectiveness? Or, Why does not the policy give clue to be efficient?

II. Guidance of the Policy in EMP Development

The first ETSC environmental policy was a basis for the development of the obsolete EMS Manual, Procedure and Record. The then environmental policy derived the planning and implementation of EMP. However, the proper EMP development was clearly affected by the absence of guiding principles on the unique nature of the tannery that would be control, declaration of regulating related aspects of the tannery activity as significant and competence, training and awareness. For instance, from the whole 45 identified significant impacts that have EMP, during the first planning phase, two (4.5 percent) aspects were subjected to regulatory requirements. These aspects were utilization of Chromium and Sulfide.

On the contrary, as indicated in the standards and different guiding manuals and literatures, the commitment to comply with national and international regulatory requirements contained at the policy statement enabled the manual to have a procedure to track and record them. The declaration of aspects of the tannery activity related to the above regulatory record served as a guide for significant impact prediction clearly. For those significant impacts, based on their priority, incremental targeting and management principle, EMP will be developed and implemented. These are the required 'walk to walk' and indicate the link of policy statement to day–to-day activity (Burch, 1996; SLTC, 1998; Diamond, 1997; Wilson and Sassevelle, 1999; SAQI, 2002; ISO, 2004a; ISO 2004b and Wainwright and Mulligan, 2004).

As compared to the intent of the above stated literature, the progressive analysis result indicates that the first policy did not guide the tracking of regulation (both national and international) and the mechanism to link significant aspect analysis and EMP preparation. Hence, the absence of the aforesaid link is one of the causes for the minimal level of EMP that aims to mitigate environmental aspects subjected to regulatory requirement. This implies that the last two years performance of the tannery was at minimum stage in relation to legal compliance. Finally, as compared to the schematic Figure 3 that abstracts the hierarchy of prevention of pollution strategy below (Anwar, 2001a; Jones and Hollier, 2002; SAQI, 2002; UNEP, 2002; Sterner; 2003; ISO 2004band Gunnigham, 2007:200-229), the mission of the tannery EMS does not facilitate its consideration in environmental management practice.



Source: adapted from Martine (1998);Stapleton et al. (2001); UNEP (2002) and Jones and Hollier (2002)

Figure 3: Schematic representation of pollution prevention hierarchy

As illustrated in Figure (3), the drive of one pillar of the EMS (prevention of pollution) should stem from the environmental policy. By contrast, the absence of the aforesaid strategic tool in the new environmental policy was similar with the pervious one. Therefore, the tannery's EMS lacks the mechanisms that facilitate sustainable resource utilization. The previous environmental policy was not capable to prove the intended and implied facilitation role in EMS implementation. The previous environmental policy was not consistently driving the EMS to live the plans and deeds of the tannery's management commitment. This implies that the tannery's EMS did not demonstrate that it is living by the commitment laid out in the environmental policy.In the following section, analysis of prediction of the tannery with respect to ISO 14001: 2004 specification and theoretical background will be discussed.

4.4.2 Environmental Planning Phase of the Tannery's EMS

This section covers the planning phase of the ETSC's EMS. First, it tries to discuss how and what environmental aspects of the tannery are identified and forecasted. It enables to examine the strength and its link toward environmental policy of the tannery for guiding the tannery activities that interact with the environment. Besides, it is a key element for a successful EMS. Then this study investigates how significant environment impact is assessed and its relation with the EMP development. Finally, progressive analysis of the implemented EMP as compared to identified

significant impact based on principles and conceptual background of ISO 14001:2004(ISO, 2004a and ISO 2004b) is highlighted.

4.2.2.1 Environmental Aspect Identification

The tannery has a procedure (ET/OP/02) that contains method for identifying the environmental aspects of its activity and products. According to the key informant (EMR), based on the procedure, each working team in ETSC'S EMS was assigned to identify the interaction of its activity with the environment. Amongst the four Working Team (WT), Skin and Hides WT started through collecting the pervious three years input and output data and analyzed the mass balance. The result was in harmony with the interview finding of WT member. However, the activity of mass balance was not documented. Then, all WT identified their environmental aspect using the same form (ET/OF/01). The form has a checklist for activities or processes of each WT relationship with consumption of goods, energy, water and generation of noise, emission to air and released to water or soil. This was followed by the assessment of corresponding impact for the identified aspects by employing the checklist (ET/OF/02).

Environmental aspects were checked for contribution of their associated impact with air pollution, storm water contamination, ground water contamination, water disposal, and consumption of natural resources, global warming, loss of aesthetic value, staff health and public annoyance. As indicated in the interview with WT members, the team of Skin, Hides, Emergency and Administration identified 13,9,14 and 8 aspects respectively. Out of the total 44 identified aspects, 28 aspects were documented in EMP due to their significant impact analysis.

Generally, environmental aspect identification and prediction contained minimal document for content analysis. However, interview with Skins and Hides WT members showed that the reason for the performed material balance was about setting the average of the last three years (before 2004) input- output activity related to leather processing and to use it for planning purpose. The process was not started through preparing the flow chart of activities and end up with identification of missing information or waste. Moreover, the documented format that was used for identification of aspect and their corresponding impact was used for all aspects related to input, process and output. The checklist that was used to associate aspects with their impact does

not have a criteria that associated environmental feature with source, type and causes of the aspect. For instance, based on the aforesaid document, aspect associated to impact, process and waste was about 29 percent, 17 percent and 54 percent of the EMP respectively. The result revealed that aspects that have EMP were skewed to pollution control (waste =54 percent) where as aspect related to prevention and precaution (process =17 percent) was minimal. The finding of content analysis contradicted with the principle of EMS that emphasize the hierarchy of prevention of pollution strategy that started from source reduction at maximum utilization, reuse, recycle, treatment and recovery and end up with control mechanism (See Fig. 2; Wilison and Sassivell, 1999;Stapleton *et al.* 2001; UNEP, 2002; ISO, 200a4 and ISO 2004b).

With respect to literature review on the process of aspect identifications, the performed action by the WT was against the procedure and intention of material balance. It included that mapping flow chart, inspecting the consistency of the map in the ground and contrasting the input and output of every major phase to identify missing element or waste. Therefore, environmental aspect identification of the EMS was not consistent with the standard to illustrate major process phases that interact with the environment; to identify the existence of waste or missing information about source, type and causes of waste on inefficiencies; to look in to customer requirement and neighbors complaint as a good source of information; to examine raw material, resource, process, supporting feature and output (product and waste) using either up stream or outcome measure or both; and to assess the incidents, accidents and potential emergency in tanning activity.

Moreover, the environmental aspect identification was not in terms of the standard requirements to assess the consequence of aspects and the mechanism required to enhance the benefit and reduce the adverse effects. This implies that the tannery's environmental aspects were inconsistent with the tannery's EMS that it accounted for. The possible causes were, among others, lack of prevention of pollution strategy experience in the tannery, lack of comprehensive policy that guide to the nature and scale of the tannery activity and/or insufficient training given by inexperienced trainer (ECPC).

4.2.2.2 Legal, Other Requirements and Views of Interested Parties

As indicated in progressive analysis of policy (4.2.1.2) with respect to guidance of EMP development (part II), the tannery's EMS was not capable to track national and international legal and other requirements until November 30, 2006. The aim of extracting requirements was to facilitate the identification of the tannery's significant impact. This intern enabled to prioritize program for that has significant impact caused by non-compliance to the regulation (ISO, 2004a, ISO, 2004b, SAQI, 2002). The results obtained from content analysis and progressive analysis of legal and other requirements were against the specification and principle of ISO 14001:2004. Therefore, the whole EMS activity in general and the performed activity (the identification of significant impact, prioritization of environmental objective and program) in particular were not aimed to comply with environmental regulation. This could suggest that the tannery's EMS is subjected to fail accounting for the promise set forth by its own management and can erode public confidence (especially in international market).

In addition, the newly documented regulation track that consists of an extensive list (16 pages) and whose effective data was in January 17, 2007, tracked national regulation and other safety and occupational requirements. The list of regulation did not include the international one. Moreover, it was not linked to significant impact analysis. As a result, the track record was a more documented one that opposed the principle and intention of the EMS, to comply with regulation. It seems that there was no intention and thoughtful implication to comply with rules and regulations. Besides, based on the above result, it is possible to predict that the intentional environmental performance of the tannery with regard to legal requirement will be much lower than the expected.

During the discussion with the EMR, questions were raised about how they communicate and collect information on the concern of the nearby community. According to the respondent, the tannery believed that they do have good relation with the nearby community and communicated the P.A.s leader (and showed the audiovisual document). In addition, as the key informant pointed out, EMS based on 14001 is a voluntary standard and a means to improve continuously.

Therefore, for the time being, they focused on main issue like compliance and then step-by-step to look for other issues. As indicated in different literature, the language of the ISO 14001 is vague and subject to interpretation differently. It could be exacerbated when practitioners experience the use of more direction protocols. Moreover, to alleviate such problem, it is recommend that time should be spent at the beginning of EMS program *"decoding the semantics of the standard and understanding the intent of each requirement and how it is linked to others in the system"* (GETF, 2000:48).

Conversely, the adoption process of ISO 14001 is voluntary based. Even if, there is no hard and fast rule to perform the specification in one direction, ISO 14001:2004 has 17 requirements. Hence, communication with stakeholder, specially the nearby community is the basic requirement. Therefore, the existed comprehension problem was not consistent with the above stated literature that emanate from the meanings of specification. Rather, the comprehension problem was on the process of voluntary adoption. At this point, it is difficult to infer other causes of such interpretation except insufficient training. But, the result led to the omission and commission of component of the system requirement that was a non-conformance to the specification.

4.2.2.3 Significant Environmental Impact Assessment

The tannery's significant environmental impact procedure contains the method that guides how to use the risk/significant assessment matrix. The matrix demonstrates interaction between criteria of temporal dimension (continuous, frequent, occasional, remote and improbable), spatial dimension (positive impact on environment or business, limited or localized, reversible, wider impact to the environment and serious damage) and a key to impact rating based on color (Dark= high, Light Dark= medium, Cross Sectional= low and white= positive). The rating scheme becomes lighter in color from major impact to minor. Based on the abovementioned document, 28 aspects were evaluated that were about 64 percent of the total aspect identified in the tannery in 2005. The total significant impacts contained in the document were assigned in the category of frequent and major, frequent and critical and frequent minor that accounted 9 aspects (32 percent), 8 aspects (29 percent) and 4 aspects (14 percent) respectively. In addition, there were 3

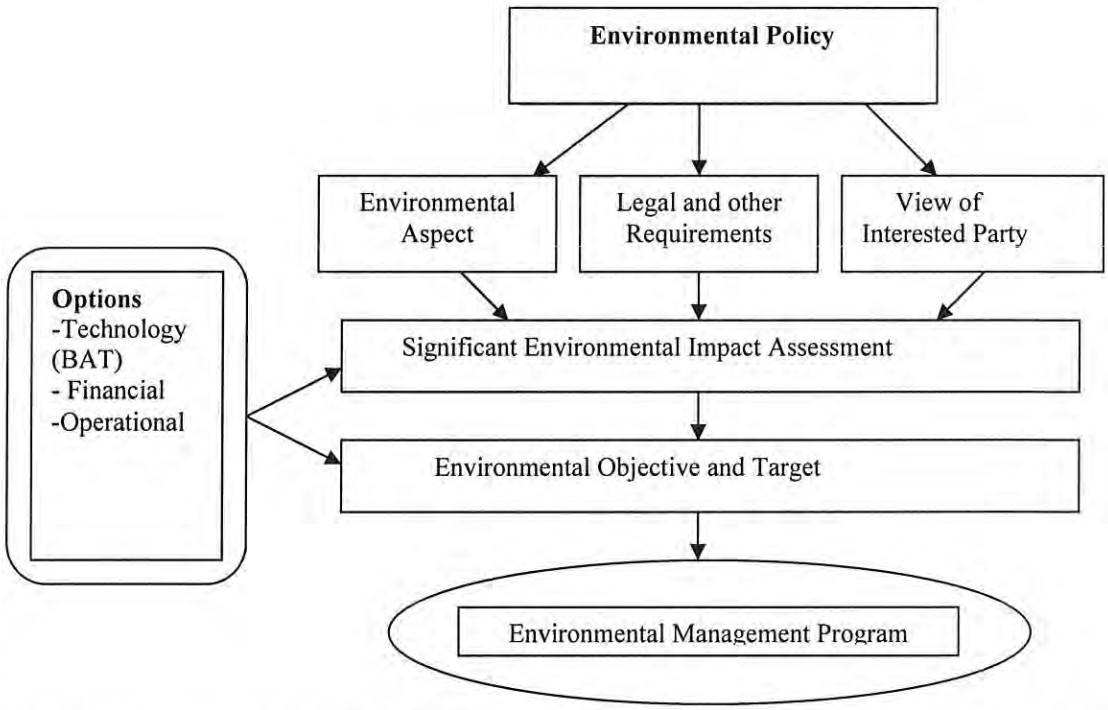
aspects (11 percent) recognized as major but occasional. Moreover, environmental aspect that has catastrophic, continuous and positive impact on the environment was not identified. The result obtained about the use of all 28 identified significant impacts for the preparation of environmental objective and target were consistent with the above procedural requirement and the standard specification (ISO, 2004a and ISO, 2004b).

Nevertheless, the first standard (ISO, 1996) was blamed for a complex, controversial and confusing requirement of the identification of environmental aspect and their impact (Kirkland and Thompson, 1999 cited in Schylander *et al.* 2006). In this regard, International Organization for Standardization (ISO) released series of standards to refine the blames of first version of ISO 14001:1996. The released standard to refine the abovementioned deficiencies was ISO 14004 as a guiding standard on ISO 14001, ISO 14031 an Environmental Performance Evaluation and ISO 14048 as guide for Life Cycle Assessment (LCA). Moreover, the ISO reviewed and delivered the amended standard of ISO 14001 and ISO 14004 in the year 2004 (ISO 2004a and ISO, 2004b). In addition, researchers, practitioners and organizations refined the tool and developed guides that are use friendly and based on the intent of every requirement of ISO 14001 (Wilson and Sassevelle ,1999;GETF, 2000; Stapleton *et al.* 2001; UNEP, 2002 and SAQI, 2002).

As noted earlier, the tannery EMS's significant impact evaluation used attractive and liberal color in the matrix. This stage of the process also did not consider resource usage, process and output separately. Mixed, uncomparable and subjective criteria were employed to weigh the value. As compared to the abovementioned literature and the schematic map that represents the process (Figure 4), the result obtained from the content analysis and interview of WT members on the tannery's environmental significant impact assessment did not go in line with the anticipated purpose of the core element. In addition, the method employed by the tannery's EMS was criticized a decade ago as it was public relation tool used to divert public attention and tried to reassure a *'feel good'* image building (Wilson and Sassivell, 1999).

Besides, as compared to conceptual schematic mapping (Figure 4) that illustrates the linkage of environmental policy and significant impact analysis, the tannery's significant impact assessment was not consistent with a refined, timely, useful and straightforward method to identify, prioritize measurable program and investigate the residual impact of mitigation measures. This implies that, the vast majority of the environmental objective, target and program did not regard compliance to environmental regulation and stakeholder interest.

Moreover, the approaches taken were insufficient to provide the framework for the *'management'* and *'continual improvement'* principle.



Source: adopted and adapted from ISO, 1999;Stapleton et al. 2001; UNEP, 2002; SAQI, 2000 ; ISO, 2004a and ISO, 2004b

Figure 4: Schematic mapping of linkage of environmental policy and other designing component.

4.2.2.4 Environmental Objective and Target

I. Content Analysis: The environmental objectives and targets are described in the tannery's EMS document (ET/09/04). According to the document, it covered 63 percent of the evaluated significant impact. The following table (1) shows example from first top and the very last part the

document (ET/09/04). As partially contained and described in the example (Table 1), the significant impacts that were listed include all identified nine major and catastrophic impacts. The document also contains half of critical and frequent, half of critical and occasional, one third of major and occasional and half of remote and minor that were nine, four, one, two and one in number respectively. The overall assessment revealed that the bases of prioritization were not clear and straight forward. Environmental objective that address compliance with environmental regulation were minimal not only on top of priority but also throughout the list. Besides, some objectives were not supported by target (see Table1 aspect number three).

Table 1: Environmental Aspect, Impact Objective and Target

Aspect No.	Environmental Aspect	Environmental Impact	Environmental Objective	Environmental Target
3	Painting/Spillage hair	- On air, water soil - Odor, sulfide - Poison for flora and fauna	- To reduce sulfide and lime spillage at source - To save hair to generate income.	- 10% decreased within five month.
1	Timing and salt	- Low aesthetic quality and toxic for flora and fauna	- To check collection of salts. - To collect timing and damp them	- 20% decreased per year - Regular collection of trimming.
4	Lime liqueur	- To air, to water, to public (H_2S)	- Properly discharged to live of lagoon - Revise method to reduce using chemical	- Regular control of sewerage - Sulfide and time decrease at 5%
5	Fleshing	- To air, to water, to public	Damping properly	Control fully and regularly
6	Chromium	At high temperature Cr^{+3} changed to Cr^{+6}	- Reduce amount of salt and use chromium exhaustion	10% decrease which is below one g/lt

Source: ETSC EMS Manual (2005)

Most of the objective emphasizes on controlling the process. Almost all targets are expressed in percentage without a baseline that indicated what 100 percent meant, a benchmark that showed where to reach and/or Key Performance Indicator (KPI) declared for planning purpose. Finally, from the total 26 environmental targets seven (27 percent) targets do not have the time frame.

By contrast in the literature review and the standard requirement, the objective that gets priority was not consistent with the environmental policy commitment of the tannery to comply with.

Hence, the tannery's environmental objectives and targets that were implemented and monitored were challenged to provide a feedback for continuous improvement and to maintain the system. However, the intention of the standard was, as clearly forwarded by Wilson and Sassivelle (1999: 125):

> Progress toward achieving your target is measured using environmental performance indicator. To help measure progress, a guidance standard on environmental performance evaluation is being developed as ISO 14031 . . . in short, environmental performance indicators are developed by your company to measure environmental performance in specific area. Unlike audits, which provide a point-in- time appraisal of your compliance with specific requirement, EPIs should provide measurement over time. This shows trends towards improved performance or achievement of objective.

II. Progressive analysis: the assessment of the progress of environmental objective and target setting found that there is absence of required document (ET/09/04). The abovementioned document was expected to contain information that shade light on how each team advanced to the remaining 27 (about 61 percent from the total) aspects. In addition, there was no evidence that could demonstrate how the tannery's EMS tracks the residual effects to each target after mitigation measure. However, it was observed from monitoring and measurement report that the remaining aspects were subject to environmental program before mid of 2006. The result indicated that the existed system was inconsistent with the PDCA principle. This could suggest that the implemented tannery's EMS was at its infant stage to bring about a system based continual improvement as promised.

4.2.2.5 Environmental Management Program

I. Content Analysis: The tannery's EMS manual has maintained a procedure of EMP that describes the relationships between environmental objective, target and programs. However, all of the 2005 EMP lists did not provide a documented budget, method, timeline and frequency of monitoring. According to the EMR for the request of the above non-conformance, there was no budget constraint in the tannery. The EMR's saying contradicts with the popular literature that declares the financial burden of environmental consideration as a barrier for implementation and negates the requirement of ISO 14001:2004. The programs were inconsistent with the common requirement that states EMP as the mechanism by which the actions identified by the implementation team during planning are carried out (Wilson and Sassevelle, 1999). Hence, the EMP is challenged to plan an action for meeting environmental performance goal and measuring progress. In addition, the EMPs were not systematically involved in narrowing down broader

long term policy commitments through the identified environmental objective and target. Moreover, even if there was a procedure that deals with training environmental awareness of employees, document that contains a training program was not found.

II. Progressive Analysis: The following part presents the findings of progressive analysis based on the content analysis of internal monitoring and measuring report of each working team, information gathered through systematic observation and interview of members involved in the activity. The exploration made on the implemented EMP presented the achievement about 80 percent of the first 44 evaluated environmental aspects reported between March, 2005 to January, 2007. The full levels of maintenance of the abovementioned achievements were described. In addition, the program that was not attained (20%) reported as a non-conformance. Generally, the basic similarity existed in all EMP are lack of quantified projected goal, benchmarking criteria, the incurred or saved cost of the EMP's and the schedule they met. Obviously, these deficiencies made impossible to analyze the level of enhancement of the EMS of the tannery mitigated and to track the remainders for future progress.

Skin WT: As clearly noted during the observation, the team prepared a well-organized document. From the following Table 2, one can observe that the EMP of hair saving presents efficient natural resource utilization, attains a remarkable achievement, which is 13 times, and 19 times higher than the baseline in the last consecutive periods. The performance was continually improved by 45 percent from the previous six months achievement.

Table 2: Environmental Management Program of Skin Working Team

No	Action plan	Total percentage change of the planed activity from baseline	Percentage change obtained in 1st six month of 2006 from baseline	Percentage change obtained in 2nd six month of 2006 from baseline	Remainder (%plan minus %actual)
1	Reduction of chromium from old recipe	10.0	10.0	10.0	Nil
2	Reduction of chromium for Pittard Crust	N.K.	44.0	44.0	N.K.
3	Reducing beam house chemical by revising old recipe	N.K.	13.0	13.0	N.K.
4	Hair saving (byproduct)	N.K.	1300.0	1900.0*	N.K.
5	Process time reduction	12.5	25.0	25.0	+12.5
6	Reduction of water consumption	N.K.	>50.0	>50.0	N.K.
7	Avoidance of kerosene use in liquid effluent treatment	100.0	100.0	100.0	Nil

Source: Computed from ETSC' EMS Document (2007).

Note: (N.K. - Not Known; * - Not sold; and +-additional achievement from the plan)

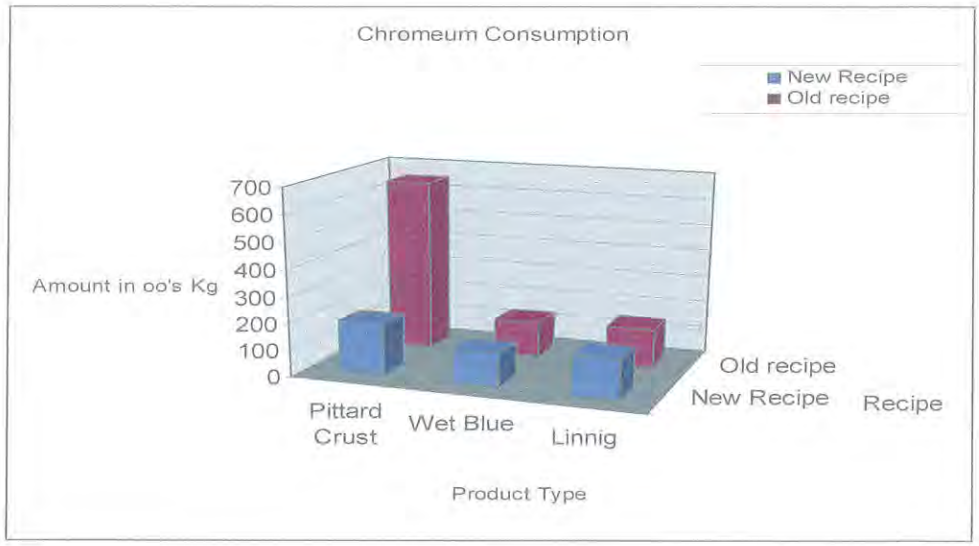
However, part of the collected hair was not sold which was the duty of administration team. The result showed that the level of integration of teams to carry across functional responsibility is minimal. This non-conformance is an opportunity for corrective action. According to table (2), the repetition of the result between successive periods exhibit that the achievements are maintained. By contrast, reduction of Chromium for other's old recipe and the new Pittard Crust differ by 34 percent. The technical division of the management contractor, the Pittards, developed the new recipe. When asked about the Pittard Crust quality of the newly recipe, the Quality Control Head responded:

> The new production system has not only reduced the amount of Chromium used and the level of dust emission but also produced a quality product that is by far superior to the previous (old) one. Besides, we were able to ultimately decrease the pollution load.

As it is described, the achievement of Chromium reduction in the other product used an additional 34 percent input from the Pittardes Crust but resulted in lower quality. This finding exemplifies the EMP of Chromium reduction of other products (number one in table 2) of the tannery was not inspired by benchmarking criteria. In addition, the tannery's EMS was not dynamic to utilize its own achievement (number two in table 2) as a feedback for benchmarking criteria to drive the maintained stationary equilibrium.

For instance, among 41 types of the tannery product contained in the tannery's EMS document, the three highest produced items were selected to analyze the reduction of chromium consumption as a result of recipe revision. As illustrated in the Figure 5, the products are Pittards Crust, Wet Blue Goat Skins and Lining. For each product recipe, the same amounts of product (for Pittards Crust, 1,141,968 Kg; for Wet Blue Goat Skis, 271,603 Kg and for Lining, 397340 Kg) were used in order to examine the level of chromium reduction.

As one can observe from the Figure 5 below, in the Pittard Crust production, the revised recipe attained about 70.2 percent reduction to produce same amount of product. As per the finding, the Chromium that has been saved could enable to produce two times another but same amount of Pittard Crusts. The saved chemical monetary value is estimated roughly (using 2005 price of Chromium as base year) Ethiopian Birr 2.1 million. Whereas, in the Wet Blue Goat skins production, the revisited recipe achieved around eight percent reductions and the Lining production remained the same.



Source: Computed from ETSC' EMS Document (2007)

Figure 5: Chromium Consumption by the same Quantity Product but Different Recipe

As compared to the old recipe consumption (that was equal for Pittard Crust and Wet Blue) and low level of reduction in Wet Blue and absence of reduction in Lining (both are not revised by the technical section of the management contractor); results that demonstrate the huge difference between Chromium consumption of Pittard Crust and Wet Blue per unit out put (1:2.6 proportionate) are in harmony with Worku's (2001) conclusion that indicated the low level of technical efficiency of tanning industries in Ethiopian. According to Worku (2001:101), similar to the findings of this study, the tanning industries were subjected to their *"weakness to productively utilize the prevailing state of the art"*. This implies that, a long journey remained to revisit and adjust the production efficiency of the tannery in particular and the sector in general.

In addition, the new technology (Annex C), installed by the Pittards, recycles water that was used for cooling the machine for drying skins. The technology partially replaced the old machine that needs a continuous flowing water and release hot water with high temperature. As per the document and expert's view, the new machine decreased the water consumption by 50 percent used for the process. As the expert of the section expressed it:

> Look! How the new machine uses the water to cool its part and releases the heat and returns to cool the machine again and again. It is fast, so we do have a short delivery time. Besides, we are able to eventually increase production and obtain better quality.

According to the expert opinion and observation, the finding was consistent with the advantage gained from Best Available Technology (BAT) (Zairi, 1996; WB, 1998 and Wilson and

Sassivelle, 1999) that raised the efficiency of natural resource utilization. However, the old machine is still operating. First, the obsolete technology that was consistent with Worku's (2001) observation indicated the sector using backward technology. This obsolete technology affected the efficiency of natural resources utilization. Second, a huge amount of saving opportunity foregone that could be realized through reduction of water consumption, the most preferred prevention of pollution strategy (GETF, 2000; Stapleton *et al.* 2001; ISO, 2004a and ISO, 2004b). As described in the tannery's EMS document and assured by the response of the interview with EMR and Skins WT member, unattained programs were identified as non-conformance. However, modifications for another trial were made for some of the programmes. The following two examples illustrate:

I. A planed goal to develop a rotary drum to shake the salted skin and preserve salt (NaCl) was failed. The aim was to prevent salt from being added in soaking effluent that increases the level of chlorine content of the tannery effluent. In addition, the collected salt was plan to be reused after purification. The team identified that the plan was not compatible with production system. However, the corrective action was, a three-time hand shacking, put in place. As a result, 36,263 kg of salt was collected between March 2005 and December 2006 on aggregate bases. The result was 16.5 percent from baseline or 87.6 percent of the plan that aimed to decrease 20 percent from the baseline. The following Figure 6 illustrates the salt collected by hand.

Source: Field work, 2007
Figure 6: Salt collected by hand from salted skins.

As demonstrated in the picture (figure 6), the abovementioned program avoids the treatment cost that might demand and reduce the effect of chloride content effluent on the nearby farmland that could increase salinity. Besides, if there was a benchmarking criteria and mechanism to reuse the collected salt, it could generate income and agreed with prevention of pollution.

II. Relatively after short period of time of environmental policy declaration, based on the program, a Sulfide Applicator Machine was developed in order to decrease spillage of sulfide painting. It was also communicated by ECPC as major achievement of the tannery (ECPC, 2005). However, the machine invented by the worker was not compatible with bulk production of the tannery. To amend this non-conformance, an enzymatic unhairing application was planned, which is one of the benchmarking activities in the process with quality and environmental advantage. However, the plan was not implemented until March 2007.

The finding obtained from the above two examples was contrary to the abovementioned implication of the Chromium reduction program. However, Chloride and Sulfide reduction program pushed the EMS towards improvement of spiral (a dynamic one) through action and feedbacks. Thus, generally, the above result shed light on slice of evidence that conform a proper EMS implementation can influence the adoption of cleaner production and BAT (Lowson, 1997 and Wilson and Sassivelle 1999) and facilitate environmental innovation (Gunnigham, 2007:200-229).

Hides WT: As one can observe from the following table (3) the majorities of the programs were implemented and the results were maintained. Despite this fact, continual improvement was not observed except two EMPs. For instance, the fourth program states that the solvent of sulfide liquor in Beam House reached a 50 percent water bases solvent from 10 percent, by the end of June, 2005. In the first period of 2006, the program reported an achievement of seven percent from the planed goal. In the last half of 2006, it reached 19 percent of the first plan. And 14 percent of a plan remained for further progress. The result clearly illustrates the existence of a critical path in the tannery's EMS to enhance further progress. As per the table (3), the eighth program aimed to use Photocell-assisted Painter to reduce input to unknown level. Implementation of the program raised the efficiency by 44.1 percent and 55.9 percent from baseline in the above consecutive periods of the year 2006 respectively. But, it was not possible to analyze the action that has been left due to absence of quantified goal and benchmarked value.

Contrary to this, the first EMP in the table (3) aimed to reduce water consumption for soaking of dry hides was not met. It was not observed any trial in the document to revisit the program. While asking the reason, the EMR argued *" as a result of the shift of raw hides from dry to wet bases that reached more than 80 percent, we definitely believed a reduction of water consumption."*

Table 3: Environmental Management Program of Hides WT

No.	Action Plan	Total percentage change of the planed activity from baseline	Percentage change obtained in 1st six month of 2006 from baseline	Percentage change obtained in 2nd six month of 2006 from baseline	Remainder (%plan minus %actual)
1	Reducing water consumption for dry hides soaking	N.K*.	Nil	Nil	N.K.
2	Reducing lime powder by revised old recipe	N.K.	4.3	4.3	N.K.
3	Reducing sulfide by revised old recipe	N.K.	4.4	4.4	N.K.
4	To make sulfide liquor solvent environmental friendly (water base)	40.0	7.0	26.0	N.K.
5	Beam house process adjustment and control to save production cost	N.K.	3.0	3.0	N.K.
6	Reducing ammonia base dyestuff by revising old recipe	N.K.	33.5	33.5	N.K.
7	Controlling the process of wet blue improper trimming	N. K.	33.0	12.0	N.K.
8	Using photocell assisted painter to save chemical	N.K.	44.1	55.9	N.K.
9	To have exhausted chromium liquor in tannery	300.0	552.0	552.0	+52.0

Source: Computed from ETSC EMS Document (2007)

Note: (N.K. – not known; and +-additional achievement from the plan)

As compared to the standard (ISO, 2004a) requirement, the result obtained from the EMR saying, which is unregistered EMP performance, was a non-conformance. Finally, there was one exceptional case, program number seven in the above table, which indicates the deterioration of achievement. The operational control program, which focused to reduce improper Wet Blue trimming, attained 33 percent efficiency during the first period. However, the efficiency was dropped to 12 percent in the last period of 2006. The finding is a feedback that demonstrates the aforementioned part of the system became worse. In order to maintain the system, corrective action based on the feedback should be in place.

Administration WT: As per the document that contains the team EMP, the section performed program aimed to reduce stationary consumption. The achievements reported from baseline were 62 percent and 63 percent in the year 2005 and 2006 respectively. The total amount of money saved reached Ethiopian Birr 103,122.90. In addition, even if there was no documented EMP, the Administration WT had planed to sell used paper and generate a considerable amount of income.

To sum up, the aforementioned discussion shows that the level of performance measured by the tannery in its main tanning process was weak. The implemented EMP that aims to comply with national and international regulation was minimal and the targeted on cultural building up mechanisms were also absent. These non-conformances are a great opportunity for improvement. Finally, the result suggested that there are opportunities existing in hand that could pay for environmental consideration. However, it requires systematic approach to improve it continuously.

4.2.3 Assessment of Significant Environmental Impact of the Tannery Production Process

This section deals with the significant environmental impact assessment of the ETSC, which focused on main production process. The method employed was considering the principle of ISO 14001: 2004 and used current practice as baseline. It also considered operational performance indicator using a combination of process or upstream factor (the amount of input per product) and result or outcome of process (i.e. amount of waste generated). It incorporates the non-regulatory concern of the tannery environmental aspect such as raw material, water, energy and chemical utilization. A functional benchmarking criterion is employed by using recommended Best Available Technology (BAT) and prevention of pollution strategy for tanning from ETSC's experience and from different literatures (WB, 1998; UNIDO; 2000; UNIDO, 2002 and EPA and UNIDO, 2003). Benchmarking is *"a comparison against best in class operation to inspire improvement in the organization performance"* (Wilson and Sassivelle, 1999: 161). Benchmarking allows the organization to benefit from experience of peak performance (Zairi, 1996 and Wilson and Sassivelle, 1999). However, it must be noted that the environmental aspect with 'no' significant impact at some time might have an identified impact in another time. It may be caused by a change in technology, procedure, knowledge or attitude to environmental stewardship (Stapleton *et al.* 2001 and UNEP, 2002). In addition, the result of measurement of one organization may be inappropriate for the other. Nevertheless, significant impacts are those aspect related to a non-compliance to regulatory requirements.

4.2.3.1 Input of the Tannery Process

The following Table 4 gives clue on the level of efficiency of the tannery resource utilization by contrasting with ecofriendly practice as benchmarking criteria.

Table 4: Resource Usage in the Tannery

No	Natural resource (NR)	Level of USE (A)	Scale /amount of use (B)	Gap from Bench Mark (C)	Compounded score (D) D=(A * B*C)	Rank	Percentage difference with Best Efficient E= (D/AB)*100
1	Hides and skins	3	5	3	45	4	300
2	Chemical	4	5	4	80	1	400
3	Water	3	5	4	60	3	400
4	Energy	3	5	5	75	2	500

Source: Field work, 2007 Note: (level of use, scale and eco friendly activity)

1. no use of Natural Resource, small or laboratory scale, and best practice
2. use, use at business and better efficiency
3. sustained use like water, important at business and fair efficiency.
4. Use non renewable, major important at business and low efficiency
5.Damping natural resource, most important with business and low efficiency

From table (4), one can understand that all resources scored five in the scale amount of consumption. It showed that, obviously the tannery heavily relied on natural resource. Chemical utilization ranks first that demonstrate the low level of efficient utilization that require priority in the action plan. Energy consumption was the most inefficient utilized resource, which is consuming four times that of the benchmarking criteria. Next, water and chemical consumption exceeded the best practice by three fold. Hides and skins were the highest ecofriendly utilized resources as compared to benchmarking criteria. The result was in harmony with the existence of best practice such as glue making and hair saving. But the result of percentage difference tells existence of remaining two-fold ecofriendly activity from the benchmark.

Generally, the result showed that the tannery utilization of natural resource was inefficient. As a result, such depletion of natural resource has significant impact on environment and business. As indicated in ECPC (2002) report, efficient resource utilization in Mojjo and ELECO Awash brought an economic benefit (ECPC, 2002). In order to extract such a foregone opportunity, there should be a documented EMP on the efficiency of resource utilization activity. Moreover, the result could suggest that one of the pillars of environmental policy, reduction of resource consumption, is at its infant stage. To mitigate the abovementioned effect, it can be taken as a potential area of improvement.

4.2.3.2 The Tannery Production Process

The following matrix (table 5) tries to assess the overall consequence of significant environmental impact analysis of operational performance of the tannery. As can be observed from the matrix (Table 5), from 14 assessed aspects, those that identified as a cause of highest, high and medium significant environmental impacts account 20 percent, 64 percent and 26 percent respectively. In addition, 85 percent of the significant environmental aspects assessed actually existed and 15 percent were potential one.

The result is consistent with the popular literature, which identifies the sector as a cause of a significant and potential environmental impact (Bneen and Dellarco, 1992; Thorstensee, 1993; WB, 1998; UNIDO, 2000; GE, 2001; ECPC; 2002; Petry *et al.* 2002; EPA, 2003 and UNIDO and EPA, 2003). According to the following matrix the tannery's liquid effluent treatment activity ranks first. Because, it is directly subjected to legal requirement, lack of continuous documented regulatory body assurance for meeting the standard and a clearly made available data as indicated in the tannery procedure. In spite of the aforementioned finding, improvement in decentralizing responsibility on waste-line control for each process division and posting standard limit that contain the consequence of non complaint is *"shut down"* was observed during field work. It was also observed that new flow meters to count the amount of liquid effluent discharged and automated screening machine to separate suspended solid was installed.

Table 5: The overall Environmental Significant Impact Assessment Matrix

No	Aspect	Aspect condition (Actual or potential)	Criteria							Result	
			Regulatory concern A	Gap from Bench making criteria B	Risk					Score (s)	Rank
					Hazard C = (c1+Cc2)/2		Interested party concern D	Community image E	Duration (Time sales) of Impact F		
					Health and safety c1	Environmentc2					
1 1.1	Soaking Department Salted Skins (Pretreating the skins with salt elimination method)	Actual	5	3	1	5	4	3	1	90.0	11
1.2	Trimming of Hides (efficiency, glue making)	Actual	3	3	1	2	1	3	1	6.7	14
1.3	Trimming of Skins (efficiency, animal fed and fertilized)	Actual	3	3	1	2	1	4	1	15.0	13
1.4	Use of preservative (avoid banned, toxic, persistent)	Both	5	5	4	4	5	1	3	250.0	9
2 2.1	Unhairing (Liming) Department By product for hair and solid wasted (collected screened	Actual	5	3	3	2	4	4	1	100.0	10
2.2	Application of chaining chemical (efficient and ecofriendly)	Actual	5	4	4	4	4	4	2	1,173.0	3
3 3.1	Deliming Department Application of deliming chemical (efficient and ecofriendly)	Actual	5	5	4	3	4	3	2	350.0	7
4 4.1	Tanning Department Chromium consumption as compared to own experience	Actual	5	3	5	4	5	3	2	337.5	8
4.2	Chromium consumption as compared to from external benchmark	Actual	5	4	5	4	5	3	2	450.0	6
4.3	Existence of Hexavalt Chromium	Both	5	5	5	5	5	4	3	1250.0	2
5 5.1	Post tanning Department Existence of unecofreinldy, banned and black listed chemical	Both	5	5	5	4	5	3	2	562.5	5
5.2	Polymer dispersion in dying (BAT and operation control and benchmarking)	Both	5	3	4	3	4	2	1	70.0	12
6 6.1	Waste treatment Department Solid (efficient utilization, proper care in disposal)	Actual	5	4	5	4	5	4	2	600.0	4
6.1	Liquid effluent (To comply with regulatory requirement)	Actual	5	5	5	4	5	5	3	1406.3	1

Source: Field work, 2007

Note: Relative values or Scores

1 = Lowest impact: maximum efficiency through integrated effort, being ecofriendly not covered by any regulation; (Matrix Score 0-0.2).

2 = Lower impact: better efficiency and good use of natural resource, operational problems, have no permanent environmental impacts. No significant financial loss; (Matrix Score 0.3-10.7).

3 = Medium impact: low efficiency, fair use of natural resource, significant environmental impact and financial loss. The activity has relationship with regulatory requirement; (Matrix Score 10.8- 121.5).

4 = High impact: very low efficiency, and depletion of resource, above the regulation requirement but not far, large – scale remedy required significant financial loss; (Matrix Score 121.6- 682.7).

5 = Highest impact: loss with catastrophe, imminent threat to environment, directly required by regulatory body, using or not assuring the non existence of banned chemical, can have effect within short period of time; (Matrix Score 682.8- 2604.2)

As indicated in the overall assessment matrix, the compounded Scores of each aspect were computed using the following formulae:

$$\textbf{Score (S)} = \textbf{(A* B* C* D*F*G*H)/6}$$

Nevertheless, the above stated result showing the highest significant impact of the liquid effluent treatment activity was confirmed by the laboratory test result (Table 6).

Table6: Laboratory Test Result of the Tannery's Wastewater

No.	Parameters	Units	Test Results	Standard Requirements**		
				Ethiopian	Egypt	W.B.
1	pH	-	7.35	6-9	6-9	6-9
2	Coliform bacteria count, Max.	MPN*	2400.00	-	-	400
3	Chemical Oxygen Demand (COD), Max.	mg/l	757.20	500.00	100	250
4	Sodium Sulfide as Na_2S, Max.	mg/l	34.32***	1.0 as Sulfur	10.0	1.0
5	Chloride, Max.	mg/l	2053.40	1000	-	-
6	Chromium					
6.2	As Hexevalent (Cr^{+6}), Max.	mg/l	0.66	0.1	-	0.1
6.3	As Trivalent (Cr^{+3}), Max.	mg/l	25.90	-	-	-
6.3	Total available, Max.	mg/l	26.56	2.0	1.0	0.5

Source: Field Work, 2007

Note: * -MNP (Most Probable Number) per 100 ml

mg/l- milligrams per liter

Max. – Maximum

** - **FAO** (1997); WB (1998); UNIDO, (2000);GE (2001); Ha Noi (2003) and EPA (2004)

*** - Sulfur (S) content equals to 14.2 i.e. for comparison with Ethiopian's provisional standard.

The table (6) shows the failed operation control of the activity to meet some parameter of provisional effluent standard (EPA, 2005). In addition, these results depicted from the above table (6) were similar with EPA audit report (EPA, 2006) that contains information on malfunctioning of effluent treatment plant.

When one employee asked on the change, as a result of EMS and management contract, within the last two years in waste treatment plant, the respondent has the following opinion:

> Before two years, when the Pittards and other foreigner (a long aged customer) arrived in the tannery, we run harshly to the waste treatment plant and start operation. We appreciated the foreigner concern about our environment. For your question, you can ask every body, first of all foreigner returned back from head office of the factory *(which is about 250 meter from the factory)*. Secondly, when someone from higher government body arrives, we found the Pittred personnel's on our shoe.

According to the worker's opinion, it is possible to infer that effluent treatment was not always functioning. Moreover, the result agreed with the result of community survey that showed 85 percent of the respondents recommends the functioning of the turbine as a solution to the problem caused by the tannery liquid effluent. In addition as one old man suggested in FGD and applauded by the participant:

> We know that about 800 people with their family get their daily food from this factory. We know the importance of the factory to the country. It is unquestionable about the tannery operation and existence....Do they forget that our help when fire hazard happening? Do not you know that we are the guard when they go home at night? So, what is the reason that stopped the turbine and agitation? Why are they doing this to us? . . . Mallo! Mallo Abakkiyaa. . .

In Oromiffaa, literary it means that, Why! Why! What wrong thing did we do? Why do they do it on us? From the old man complaint, it could be inferred that the probability of releasing effluent of the tannery with out treatment is high. In this regard, the tannery's budget of Ethiopian Birr 903,000.00 allocation to upgrade the effluent treatment plant is not only a timely activity but should also be implemented as quickly as possible, to alleviate the above problem.

The second highest significant impact identified was the existence of Hexavalent Chromium (table 6) in the aforesaid matrix (table 5). The result clearly exhibits that the operation control to prevent the existence of Hexavalent Chromium is at a minimal level. Among others, the cause of

Hexavalent Chromium includes lack of training on operation control that focused on high temperature. Because, at high temperature, it is known that Trivalent Chromium will be changed to Hexavalent Chromium (Thorstenseen, 1993 and UNIDO, 2000), which has carcinogenic effect (UNIDO, 2002 and Ha Noi, 2003). During fieldwork, it was observed that the tannery was installing new tanning drum that might enable it to handle the problem if appropriate training and procedure is in place.

Moreover, procedure to protect purchasing of blacklisted chemicals was absent. As a result, the possibility of purchasing and using the prohibited input was high. It includes those input for the aspect of the tannery 1.4, 2.2, 4.3 and 5.1 in the above matrix. The procedure can made possible to reduce risks partially for the second (Hexavalent Chromium) and third (Unhairing Chemicals) and fully for fifth (Azo dye, Cadmium painting) and ninth (Persistence and banned preservative, PCP) ranking significant impact. However, the aforementioned effort should accompany by a Material Safety Data Sheet (MSDS) and material balance report. Besides, when the effort is supplemented by supply chain management, which is buying from those who are recognized for environmental stewardship, it reduces the risk of existence of banned chemicals and raised the confidence of interested party. It includes, among others, importing from supplier that are certified in ISO 14001 or gained recognition by major destination of the tannery's product (Konard, 2005). When asked the tannery's position on this issue, the tannery EMR was reflected:

> We [the management group] are forced to buy chemicals based on the least cost purchasing principle of the government. Most of the time, the winners and suppliers are Asian countries. We do not have the problem with the above said thing. The problem is we do not know whether the qualities of the products we are receiving are as per the specification we provided. And we are discussing on the issue.

The result confirmed that the tannery is in its weak position to prevent the existence of banned and blacklisted chemicals (EC, 1992; GE, 2001; UNIDO, 2000; WB; 1998; Bakker and Nijhof, 2002 and Ha Noi, 2003). In addition, the incident could be exacerbated when the tannery reaches as a "100%" finished product for export (Annex B). Therefore, the value adding activity that includes dying could increase the use of abovementioned banned and blacklisted chemicals.

Moreover, in the above matrix, the reduction of chromium consumption was evaluated using internal and external benchmarking criteria. Benchmarking is very important to emulate good performance (Zaire, 1996 and Wilson and Sassivelle, 1999). As compared to Chromium

application of the Pittard Crust (internal benchmarking), the other product consumption was required to decrease 22 percent (a decrement of 1.1 percent in the total solution) from the current one. If external (SLTC, 1996) benchmarking criteria were considered, it will require to decrease 40 percent (decreasing 2 percent in the solution). Mechanism to attain the reduction of Chromium includes optimized operational control that enhances chromium fixation (temperature, auxiliary and pH of the solution), suitable drum, splited hides and skins, injection of tanning solution through high pressure (WB, 1998 and UNIDO, 2002) calibrated equipment and trained man power who know and act up on the consequence of deviation activities (Besterield *et al.* 2001; Stapleton, 2001 and ISO, 2004b). Finally, the application of unhairing chemical was among the most significantly assessed impacts. The finding was in harmony with the previously stated failed EMP (Sulfide application) to control the spillage of sulfate. Moreover, the existence of water-soluble unhairing chemical and enzyme with equivalent cost (UNIDO, 2000) can provide better quality and make the aspect to be handled as the first priority.

Generally, if the tannery assessed its significant impact objectively and evaluated using the recommended standard, ISO 14031; and used the result of EMP preparation, the new confidential EMP most probably might address all identified aspect in the Table 5. The difference might have exists a slight variation in priority. Specifically, by contrast with the previous EMP, most of related aspects in the matrix were reported as they were accomplished or maintained. However, these are the areas for better improvement to bring highest significant impact to lower and lowest impact that could be handled through a continual planning of action and management of lesson learned. Hence, the method employed in the planning phase of the previous EMP was not sufficient to evaluate and reach environmental hotspots. This could suggest that, the tannery's EMS is required to upgrade the environmental performance of the tannery and lead to a proper function of EMS that could restore the negative image of the nearby community and build the confidence of interested parties. Because, as stated in different literatures, the tannery lacks the above mentioned evaluation method, as ISO 14001 insists, that emanate from developing and understanding of the scope and magnitude of conscience information *'about management's effort to influence the organization's environmental performance'* (ISO, 1999a: 8). Last, but not least, the aforementioned method also enables to track pitfalls for remedial action (ISO, 1999a; SAQI, 2002 and UNEP, 2002).

4.3. Implementation Phase of the Tannery's EMS

This section presents the results of the analysis of the content, progress and interview that was conducted with employees on the implementation of competence, training and awareness and operational controlling component of the tannery's EMS.

4.3.1 Competences, Training and Awareness

4.3.3.1. Content Analysis

In the obsolete ETSC's EMS manual, that served from March, 2005-to January, 2007 and acted as a bases for ISO 14001: 2004 certificate, namely 'awareness, training and competence procedure' described among others, awareness training should be provided to all, including new employee.

However, from the aforementioned 44 significant environmental aspects that were subjected for mitigation in the last two years and the majority of work instruction, the environmental competence, training and awareness was not directly stated or implied. The program to avoid the existence of Hexavalent Chromium could be a good example. The program does not describe or infer how operators prevent, control and understand the causes and effects of Hexavalent Chromium. As a result, the operator is unlikely to perform required *'tasks on this behalf'* (ISO, 2004a and ISO, 2004b) to prevent the environment. Even if one has the BAT, documented controlling procedure, calibrated instrument and uses a known Hexavalent Chromium free input, an operator who is not knowledgeable about the effect of high temperature on chromium, prevention and control mechanism can cause the creation of Hexavalent Chromium that has carcinogenic effect and regulated elsewhere (EC, 1992; SLTC, 1996; WB; 1998; GE, 2001 and UNIDO, 2000 and Ha Noi, 2003). As compared to the standard, ISO 14001:2004 requirement that states *"those persons whose work could cause significant environmental impact(s) identified by the organization are competent to perform the tasks to which they assigned"* (ISO, 2004a: 14); the aforementioned finding that showed the lack of training on significant environmental impact is not only a non conformance but also its implication.

The absence of documented guideline concerning the training and awareness for all about the common goal was not in harmony with the standard that required as a perquisite mechanism in order to convey and convince the organization motivation to the employee (ISO, 2004a and ISO, 2004b). Therefore, the tannery's EMS does not give an evidence of planning for the participation and involvement of employee that makes them to feel belongingness to the system and provides a frontline input. This implies that, as illustrated in Wilson and Sassivelle (1999), if workers do not support the system in the abovementioned manner, the system will fail no matter how other requirements are in place. The tannery losses the chance that could benefited from system based development. By contrasting with win-win development of system approach (Bruch, 1996), the leather processing could benefit. Because, the production process (Annex F) of hides and skins is characterized by a contagious effect (Thorstenseen, 1993 and WB, 1998) that equally demand every one's care from beginning to end.

Alongside with procedure, job description, and WI, an evaluation guiding procedure or format for the awareness training was not developed. Hence, the mechanism that assures a consistent sending and receiving of message and information was absent. No description on the procedure was found in order to know many details about the full range of the *'awareness, training and competence'* part of the tannery's EMS. This could result the absence of critical tools in the tannery's EMS to drive environmental awareness and communication initiative for the success of implementation and a mechanism to reinforce policy commitment based on the feedbacks (Willson and Sassivelle, 1999). It includes suggestion box, education bulletin (Yarnell, 1999 and GETE, 2000) and scheduled Green Park meeting (ECPC, 2005) with a clear guidance as to how suggestion is handled and education bulletin are distributed (Yanenell, 1999). Hence, to met its policy statement, the tannery's EMS says very little to guide the cultural building activity that could integrate environmental stewardship in the day-to-day activities of every one. But, the mere existence of awareness training procedure, which was incompatible with the requirement, could not contribute to the existence of human resource development to carry the system. This could suggest that the developed guides on competence, training and awareness of the EMS was not targeted to develop a virtually working EMS without existence of *'carrot and stick'*. Hence, the EMS of the tannery lacked the imperative to improve environmental performance.

4.3.1.2 Progressive Analysis

Awareness training was given for about 75 percent of the employees for one to two day sections. These represent 70 percent of permanent employee of the tannery. It indicates, the tannery environmental policy guide and ISO requirement for policy to be communicated have generally met. There was no document that shows scheduling and range of delivery (participant number). But, from the signature of training attendance, awareness training was delivered within the range of 13 to 64 persons per session. The training period varies from one and half to two days. New employees were also incorporated in the training section.

Most of the time, the trainers were the EMR and those members of the Realization Team. The tannery trainers did not evaluate the effectiveness of the awareness training. So, the trainers do not know the perception and attitudinal change of trainees on a covered subject matter. Besides, they lack the feedbacks that help to focus on difficult area of workers understanding. However, during the interview with bottom line workers, who attend the awareness training and orientation of emergency and preparedness section, they confirmed that the training does not aspire or acquire them a knowhow related to their day to day work. In addition, the absence of progressive and effective communication with the frontline could hamper the system to utilize the input from the legacy of rich experienced workers.

The awareness training provided in the tannery was the only exercise that was not planed. Therefore, it could not be guaranteed for the extension of environmental awareness throughout the tannery. It is plausible to suggest that the tannery's EMS should build on a narrow base instead of broader common ground that affects the believes and deeds of employees toward parito- development (Brunch, 1996 and Khan, 2003) that has a well-matched attribute to handle the transmittable effect of leather processing.

Finally, as indicated in the newly approved EMS manual, the name of the title matches the standard requirement and adds a new form that could help to assess the training need of each working team (WT). The EMR is responsible to coordinate the assessment of six WTs (that has been four in the previous manual). Once again, this is a good start but too late.

Despite the above low level cultural building performance, the awareness training and EMS development in the tannery enhanced the communication between young experts and management, and created behavioral change on considerable number of line employees toward environment. In the former, to illustrate, one expert responded to the change that EMS brought in the tannery-working atmosphere as follows:

> Before EMS, I followed up and ordered line employees, reported to my boss and went to my home. After the start of EMS implementation, I started from scratch, read at home to come up with understanding and idea, discourse about EMS freely with top member of the management, realization team, and friends. I learnt the difference between friction of idea and personality. I learnt to listen to bottom line workers and drain their experience to feed the EMS. In the mean time, I found myself commenting in the top management meeting . . . that was undreamable before EMS.

The expert's saying was similar with the finding of the interview made with EMR, team leader, experts and some workers.

Later, a worker was initiated to contribute his effort to EMS after attending awareness creation training. During the discussion, the respondent had the following:

> The plastic milk jacks thrown throughout the tannery compound attracted my attention. I started collecting and making them as shopping bags. The workers and neighbors are my customers. I continued to use coffee handling bags for the same purpose. Every one started collecting waste bags for me. After having generated some income, I started saving account in Commercial Bank of Ethiopia (Mojjo Branch) amounting Ethiopian Birr 7060.

The findings from the above two respondents showed that the effect of the tannery awareness creation training exhibited behavioral changes of workers. Besides, the activity that aimed at cleaning the tannery compound enabled the workers to generate income. Nevertheless, there are a considerable number of workers who still are passive and fear to discuss on the issue of environment when asked for an interview to this study that will be discussed in depth in the next section.

4.3.2 Interview Result of Competence, Training and Awareness of the Tannery's EMS

In this sub section, result of interview that was conducted with employees other than the EMR will be presented. Generally, 13 of 14 respondents (92.9%) were aware of the tannery's EMS in different mechanisms. However, for the proceeding question that inquire whether they provide input to EMS, 9 of 13 (69.2%) respondents assured that they participated from the first ECPC training up to the present that include gap analysis, material balance, EMP preparation and implementation and monitoring and measuring. Two of the 13 respondents who are familiarize with the tannery's EMS, in the awareness training, they received the training but they did not offer input. The reason why they did not offer the input, they mentioned that no one tells or insists them. Afterwards, when asked if they were insisted, one affirmed to provide his input while the other refused. Surprisingly, two of the 13 respondents asked their friends and have heard the reason of the recently repeated visitors and ordered to wear their proper clothing, was for the purpose of the tannery's EMS audit. The above result showed the low level of achievement in cultural building towards EMS.

Eleven of 14 respondents (78.6%) know the policy. Obliviously, nine of eleven (81.8%) know the places where the policy document is found. 5 of the 11 sow the poster and heard in the training section but they were not familiar with the EMP in their section. For the question about the duration, no respondent specified rather, all said *'so many times'*. From this result, one can infer that, the policy statement is posted in location that made it observable. As a result, it complies with the required visible posting location.

Nine out of the total respondents know their responsibility related to EMS from job description and work instruction; they also carry out team work together. However, no one knows his specific duties related to the implementation of EMP. Besides, most of the workers did not affirmatively respond in-depth for the knowhow of specific environmental assignment given for workers in the tannery.

Even though, most of the respondents believed the shallowness of EMS communication, a newly assigned leader of one WT rated the communication effort of the tannery's EMS as excellent. The same respondent also believed that the tannery needs to improve its EMS in general and

competence, training and awareness program in particular. According to the respondent, the reason was because EMS is a continual improvement. There are employees who did not receive the awareness training and employees who fear to be seen with outsider and not willing to discuses environmental issues. The aforesaid inconsistency of result indicates the existence of comprehension problem that comes from insufficient training (Yerenell, 1999 and Stapleton *et al.* 2001).

Most of the respondents were rated equally in process recycling, treatment and recovery and control mechanism as an activity with immediate benefit of the knowledge/skill acquired from the training. The least rated knowledge with immediate benefit was source reduction and outside the process recycling in descending order. As compared to option of preference in prevention of pollution strategy, the results negate the hierarchy that descends source reduction, in process recycling, outside the process recycling, treatment and recovery and control mechanism (See figure 3; Stapleton. 2001; Sterner, 2003 and UNEP, 2002). Despite these differences, most of the respondents preferred in process recycling by mentioning the new Drying Machine (Annex C) as a solution from new technology.

Interms of the place and preference of acquiring and receiving information, most (63%) of the respondents indicated office of division head and gave equal weight for all sources respectively. All respondents were questioned whether they visited a demonstration site for environmental stewardship, and participated in any EMS training related to EMS and prevention of pollution strategy after March, 2005, no one answered affirmatively. When asked about the kind of environmental training needed by tannery employees, they suggested that, both general and specific, through seminar and documentations aggressively required. All respondents agreed the need to improve competence, training and awareness program of the tannery's EMS. Hence, no one responded yes of receiving more environmental training as compared to their expectation.

Almost all respondents, who were WT leaders and experts, rated the communication of the EMS as satisfactory, except the aforesaid new WT leader. This indicates the existence of high level of training and awareness diffusion among managers and experts than bottom line workers. For instance, of five bottom line employees who were asked to rate the communication of EMS in the tannery, three (60%) of the bottom line employees believed that the tannery has a poor performance of communication. The result showed that the majority of the front line employees

did not receive not only the competence training as managers and experts but also awareness training. The finding was in line with the progressive analysis of this section that demonstrates the level of awareness about the common binding goal among bottom line employees was minimal.

All of the respondents personally feel that they would like to receive more training on EMS. However, the team leaders and experts preferred the competence and training part and comment on the immediate provision of training for new and transferred employees. Whereas, the bottom line employees indicated that both general and job specific training are necessary. Most of the bottom line employees needed more training on the link between their work and EMS, operating procedure that focused on liquid effluent treatment, follow up and handing of solid waste and documentation. Despite the low level of performance of the tannery with regard to competence, training and awareness, almost all respondents, including those who do not take the awareness training, believed and hoped that the competence, training and awareness component of the system will be continually improved.

Moreover, the team leaders and experts commented that one of the problems that hinder the extension of awareness for all includes different employment base (permanent, temporal and daily) and turnover of employees (expertees) with experience and good idea which affects the overall performance of the EMS. In addition, when environmental issues are raised, there was always a challenge from workers associating it with safety issue although ISO 14001 does not require it (ISO, 2004a). There was a difficulty to convince them. This fact is in harmony with the Yarenell (1999) finding in his study on EMS of Vancouver International Airport Authority.

Hence, the interview result supported the content and progressive analysis that exhibited employee environmental knowledge, skill and training requirement that has not been identified. The interview result also showed the low level of knowledge and skill of employee to understand the consequence of deviation from their routine work. It also exhibited the need to have a stronger practical link based on knowledge between responsibility in job description, work instruction, operational controlling, procedure, EMP and the environmental policy. The tannery's EMS lacks the mechanisms of following and provision of recent information which may erode the confidence of employees, as described by Martin (1998), on management's commitment to the environment.

The overall assessment resulted that the strategy implemented by the tannery EMS's to build common vision and environmental stewardship among workers was much more below the required standard. The standard indicates the environmental awareness gained by training is a central tenet of any effective EMS. As stated in Wilson and Sassivelle (1999: 112), *"It is the commitment to the individual people, in the context of shared environmental value, that transform an EMS from paper work into an effective process"*.

Because, it is known that environmental training is the best and efficient way of addressing cultural change towards the environmental stewardship. As Oliend *et al.* (1991) cited in Michael (1999: 43) emphasized the idea:

> Environmental education is seen as the only way of developing awareness of the environment and a sense of responsibility for its protection, and hence it is the most effective vehicle for persuading the human race to adopt a rational attitude toward the natural environment and to avoid the deterioration of human life as a result of unwise exploration and mis-use of nature"

As compared to the above quotation, the abovementioned result could give ground to suggest the top management to ensure the EMS is understood, accepted, embraced and has become a culture of all employees of the tannery through competence, training and awareness. Moreover, encouraging employees' suggestion and initiatives, and recognizing and rewarding good environmental performance are expected in implementation. Since 1959, U.S.A's. industry grows by 25 percent as a result of contribution of performance raised by employee training (Wilson and Sasseville, 1999).

4.3.3 Operational Control

As indicated earlier, operational control and working instruction has been developed and documented for several activities such as Chemical Store keeping, Beam House activities (trimming), Unhairing, Tanyard, Post Tanning, Solid Waste and Liquid Effluent Treatment Plant and Emergency and Preparedness. As per the document, most of them clearly stipulated the criteria and responsibility of each activity. The very similarity that existed in the aforementioned operational control is their focus on compliance management activity. Those activities assigned to prevent pollution or conserve resources are minimal. As compared to literature and standard that described training as an inclusive component of operational control (Martin, 1998, ISO

2004a and ISO, 2004b), did not exist. This finding was similar with the finding of content and progressive analysis of competence, training and awareness.

Moreover, the existed operation used to approve new chemicals by quality control that lacks complimentary effort of purchasing procedure. Here, this does not have a preventive mechanism of blacklisting confidently; rather it targeted to least cost but not quality of the input. As indicated is Konrad (2005:102) "*substance rejection list does not generate any new knowledge rather, they are used to apply already, existing external and internal environmental rules make systematically*". As described in the citations, the tannery's EMS cannot benefit by having the abovementioned substance checklist.

According to the observation in the tannery process, the Chemical Store keeping procedure is observed as one of the most effective guide in place to ensure consistency whenever any staff is changed (Besterfield *et al.* 2001). It was observed that the plans, precaution signs, records, segregation of chemicals by their nature was designed and implemented through the consideration of anticipated change and response to emergency.

Nevertheless, in Beam House operations workers were observed deviating from work instruction in trimming. For the question why raised to one of those workers who deviate from the procedure, respond:

> I know how to do it. But, what is the difference of doing it in another [proper] way of trimming. For the last two years, there was no salary increment and bones, although the cost of living increased dramatically. The amazing news is, based on 20-40 (service year and age), I should retried due to the new structure. Have you seen the '20-40' machine, which was full of dirt came from the developed world. Tell me where are the EMS people?

As described above, the response of the worker illustrates that having a written procedure should not be the sole target for establishing instruction. Rather, as indicated in Stapleton *et al.* (2001) and ISO, 2004a, it should guide and charged accurately. Thus, the tannery's EMS procedure was not in harmony with the abovementioned literature and standard that showed the aim of procedure is to assure a consistent, accurate, preventive and controlled performance as it is not affected by change of staff (Martine, 1998 Besterfield *et al.* 2001; and Stapleton, 2001).

In order to conduct content analysis, a document was not found showing scheduled preventive maintenance and calibration report on instrument. When asked about the calibration status of the thermometer in Chromium application as issue, the quality control senior chemist responded that getting instrument calibration including thermometer service from one center of QSAE makes it a challenge for prompt reply. Even if an elaborate preventive maintenance was not needed in all operation procedures, it should be considered for equipment that could have significant environmental impact. Since, calibration of instruments should be based on the declared due date (Stapleton *et al.* 2001 and Martine, 1998). Special emphasis should be given here for those instruments used in measuring and monitoring activity. Hence, as compared to the above literature, the majority of the efforts to build environmental performance into operational activity are at documentation stages that requires implementation like that of Chemical Store. As a result, it was not plausible to infer for the non-existence of deviation from the allegation of the environmental policy pillars.

CHAPTER FIVE

5. Stakeholder Perception and Involvement in the Tannery's EMS

One of the objectives of this study is to assess the stakeholders' demand, participation, the level of influence on the tannery's EMS and their activity. The next parts of this chapter provide presentation on the result of survey among the nearby community at Edjerssa, where ETSC is located.

5.1 The Nearby Community

Here, the externality (positive and negative) perception and involvement of the nearby community in tannery's EMS is presented with results supplemented by information gathered from participant of two FGD. ETSC is located in a sparsely populated area at Edjerssa, near Lake Koka, about 90 kilometers south of Addis Ababa (Annex D). The settlers of *Dingugi Bekele Peasant Association* in the surrounding area of ETSC are divided in to three *'Gote'* or villages known by the name *Bekele, Bissana Bekele* and Mazoria. The total number of household is 541, within an estimated total population of 3785 (Accordingly to P.A., 2007).

5.1.1. Socio-economic Background of the Respondent

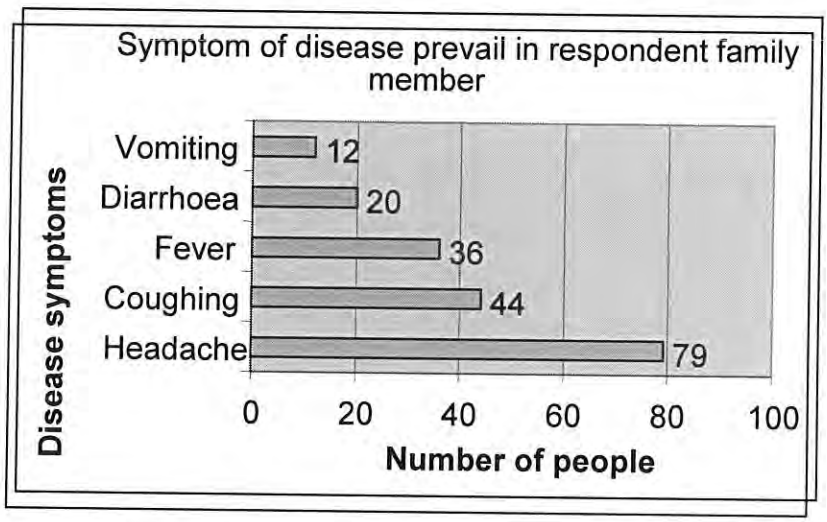
All the respondent household heads are engaged in agricultural activities and have been living in the area since birth. 69 percent of the respondents' age is 40 and above and know the tannery ever since its erection. As most of the respondents spent their lifetime in the area, the information drawn by the survey is believed to have been acquired from persons with first hand experience regarding the interaction between the tannery and the nearby community.

The average family size of the respondents is seven, which is almost similar to the average size in the region and the country (CSA, 2006). The educational status of the respondents who are illiterate and first cycle were 26.2 and 64.3 percent respectively. Even if most of the respondents are at low level of education, they send their children as young as six to school. In addition, the survey revealed that about 19 percent of the respondents are estimated to have monthly income below Ethiopian Birr 250 while the rest ranges from Ethiopian Birr 250-500. The proportion of galvanized corrugated sheet roof to grass roof was one to two, which showed not only the fair level of income distribution of respondents but also the level of the urbanization. The low level of residents' income and education level, according to Owen *et al.* (1998), resulted in low demand

for environmental safety. In spite of the above results, participant in the two FGD from *Gote* Bekele and Bisana Bekele were not hesitant to express and seek what they thought should have been done by the tannery that extends to *'Caaffee'*, the parliament of the regional state of Oromiya. As participants of the aforementioned FGD argue, the reason for inconsistency in education, income level and environmental consciousness (Owen *et al.* 1998) include the availability and the utilization of information form mass media (radio) and public meeting.

5.1.2. Perception of the Nearby Community toward Health Condition

According to interview result from the survey, 87.7 percent have confirmed the existence of health problem in their family. Mothers were most vulnerable to experience the symptom of sickness, followed by fathers and children (whose age between 6 and 15) in the proportion of 8:7: 4 respectively. The following figure (7) depicts the most prevailing symptoms in the responding families.



Source: Field Work (2007)

Fig: 7 Symptoms of Disease Prevailed in Respondents Family Member

Headache, coughing, fever and diarrhoea have been the most prevailing symptoms in descending order as shown in Figure 7 When asked the frequency of occurrence of the symptom, they said headache and coughing existed every other day. Most of the respondents associated the aforementioned symptoms with the foul smell and wastewater of the tannery. In line with this result, participants involved in the above said FDG confirmed the existence and consequence of the symptoms. The other point raised in FGD was the association of the foul odor wastewater and

disease with its effect on agricultural activity. According to the participants in both FGD, during harvesting period of *'Teff'*, no one from the daily laborers, who are local called *'Achage'* (which means crop harvester and cleanser), was interested to work except for a higher wage than neighboring P.As creating the shortage of daily laborers and affecting productivity.

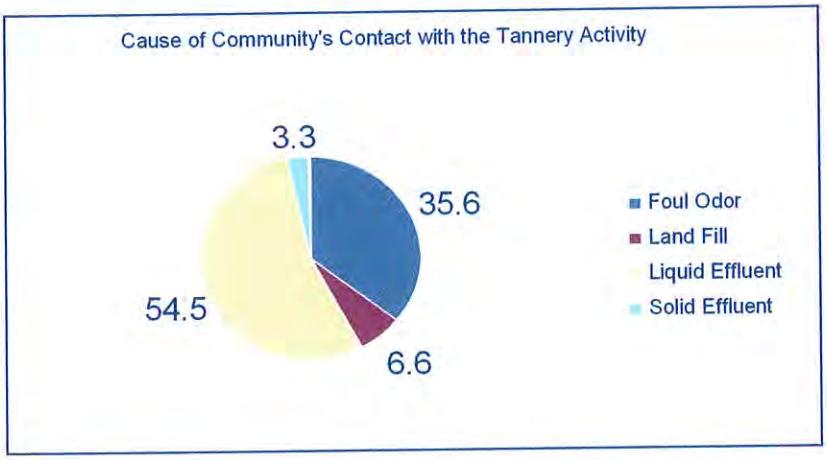
The most prevailing disease identified by the household head in descending order are malaria (95%), chronic bronchitis (86%) and repeated diarrhoea (86%). When asked about the personal judgment in ranking order, the respondents associated the tannery effluent as cause of chronic bronchitis followed by repeated diarrhoea. In the last three months, from those who experienced these diseases, 77.8 percent of these families visited health center. According to these respondents, the diagnosed diseases were fever or malaria, diarrhoea and bronchitis in ranking order. Koka Health Center took the lion's share of health center visited.

The above result of diagnosed diseases was consistent with Koka Health Center's report on the format of WHO requirement (ten high disease of last three month). The FGD participants reflected similar findings. As mentioned by the FGD participants, the issues highlighted were high cost of transport and medication and loss revenue as a result of absence from farming activity. However, the symptoms indicated by participants such as headache, coughing, congestion of nose and sore throat were not enough reasons to go to health center.

The incidences of malaria or fever were usually primary diseases in the area, which is *'Kola'* and found in the Rift Valley. The high incidence rate of diarrhoea and child vomit may arise from the high level of *coliform* existed in the effluent of the tannery, which was six fold higher than the World Bank (1998) requirement (Table 6, FAO, 1997 and WB; 1998). Moreover, the existence of coughing, bronchitis and headache are consistent with the EPA (2001) assertion of the untreated tannery effluents, which is full of hazardous chemical and *coliform,* that can cause such water-borne diseases (EPA, 2001). Hence, the result seemed to refute the tannery's claim on non existence of domestic challenge due to possession of primary and secondary waste treatment plant.

Perception of Nearby Community on Tannery Activity and Environment Issue

Among the entire respondents, 90 percent confirmed the existence of problem with the tannery as a result of effluent emission. The following figure (8) indicates the perceived cause of the contact with the tannery activity.



Source: Field Work (2007)

Figure: 8 Cause of contact with the tannery activity

As shown in Figure 8, the respondents believed that they received the most negative externality caused by liquid effluent and foul smell. They said that the foul smell is intensified in wind and dry seasons and late afternoon and associate the peak occasions of the problem with religious holidays. Most of the affected activities ranked by respondents were mealtime, farming and sleeping in descending order. Those respondents who complain on landfill (4 households) dated the cause back to the erection of the factory, 30 years ago, and blamed the tannery for not keeping the promise for compensation.

When asked about the observed change in reaction to emission and effluent in the last two year, 16.6 percent of the respondents affirmed the changes in the intensification of negative externality. In order to mitigate the externalities, the actions recommended were to:

- burry liquid and solid effluents within tannery compound; and
- continuously treat or 'agitate' the liquid effluent before releasing

All of the respondents negated the idea of leaving their area citing possession of farming land, and unenthusism to leave their birth place at old age as reasons. Obviously, regarding a request to leave the area due to emission of tannery, almost 81 percent of the respondents rejected the idea.

In addition, 76.2 percent of the respondents assured that they have discussed issues related to tannery activity, the core element being the effluent discharge from the tannery. Majority of the respondents also confirmed that they raised the issue and discussed on the matter more than three times with the neighboring P.A. leaders and D.As. Moreover, there were a considerable number of respondents, 20.7 percent of those who discussed on the matter and forward their complaints to the managers of the tannery and no improvement was observed.

The above result was similarly reflected in FGD discussion. The participants noted that, following the death of more than 90 cattle in the area in 1988, they appealed twice to *'Caffee Oromiya'*- parliament of the regional state of Oromiya when the instance attracted huge media attention and people from the television and radio recorded the event. However, the news was not put on air. And the regional government could not provide the protection with enforcing the tannery to treat the waste either. Participants in both FGD believe that they are neglected. As per the opinion of one participant, *"making the tannery to contain its waste by the community is equivalent to pushing and make plane that big mountain"* by pointing to Mt. Zequla. The finding showed how strong a negative image the nearby community has towards the tannery. The only reason why they are still living in the area is nothing but their powerlessness.

One fifth of the respondents knew the EMS of the tannery based on information obtained from such sources as the D.A.s and their friends. In addition, among those who knew about the ETSC's EMS, half of them (or 9.5 percent of the total) knew about P.A.'s leader participation in the meeting held in the tannery. Answering whether the P.A. leaders provide input for improvement or not, the respondents replied that they did not know. When asked about their participation on awareness creation program of the tannery's EMS, almost all respondents negatively responded and ranked the tannery EMS communication to the nearby community as poor.

About 45 percent of respondents know their constitutional right to live in a clean and healthy area. They nominated social gathering *(Idir and Debo)*, meeting in P.A. and radio were the sources of information in ranking order. When asked about sources of information on environmental issue, most of them referred Koka and Majjo Health Centers. The result demonstrated that the majority of the respondents were at low level of awareness to their right

and appeal to court. Responding to the sort of improvement they demand from the tannery in the future to effect good relations, the following three recommendations were given.

- The tannery should use its utmost effort to contain the waste within its compound, if not, it should treat it until the effluent becomes harmless.
- The tannery should share not only the negative but also the positive externalities such as Ambulance and Clinic services with reasonable price. Moreover, it has to extend the current two day water supply to seven days a week supply for all.
- It should provide employment opportunity for youngsters of the nearby community.

Furthermore, in responding to what the regional and federal government can do to improve the relationship with the tannery, the following were the most frequently indicated demands the government should enforce the tannery to hold its waste. The government should reply to our request for compensation or subsidies to the dead animals. Besides, the government should investigate and report to us why the fish population in the Koka Lake is decreasing and why our farmland stopped growing vegetable and chickpea.

The above stated result was similarly reflected in the two FGDs. Participants involved in FGD pointed out that they were promised to get jobs in the tannery at the inauguration ceremony of the tanner 30 years ago, however, because of illiteracy, they failed to get the opportunity. Now, they want the tannery to take their educated and unemployed youngsters into consideration. Moreover, participants remembered that ever since their complaint in 1988 that resulted in TV and radio recording, no one visited the nearby community. And when the turbine of waste effluent treatment starts working, obviously, the participants know for sure that the government officials are about to visit. In such an event, once the official leaves the tannery, every thing gets back to usual. No improvement was observed. The saying of one old man in Oromiffa that was agreed by other participants in one FGD goes:

'Afaa Cinaachaa kan itti rafuu malee kan afuu hin-arguu'

Literary, it means that, the comfort and satisfaction one gets from an overnight sleep is truly tested, felt and known by the one who slept on it, not the bed maker or visitors. As per the above reflection, the influence of the visitors did not bring continuous change in the tannery's effluent handling.

The participants in both FGDs believed that influencing the tannery by them is unthinkable. Rather, the regional government can enforce the solution. They argued that knowing rights could not serve them as a key to open the door of bureaucrats. The participants conceived that if some one belonging to them was found in *'Caaffee- Oromiya'* regional state parliament, things would have been different. In spite of this, some of the discussants in both FGDs held different views on the issue of recommendation that the tannery would do to improve its relation with the community. The bases of their argument were the need for electric power and clean water provision by the tannery. Even if most of the participants appreciated the idea, they agreed to focus on the aforementioned basic issue.

Despite the above negative externality, the tannery provides clean water to the junior school. It is also raising 80,000 seedlings within its compound, with technical support from the P.A. Agriculture and Rural Development Representative Office to distribute for the nearby community freely in the coming summer. As indicated in the discussion with the D.A.s, the planting of seedling type was based on farmers' demand. When asked about the total budget of the nursery project, the EMR replied that they have asked the aforementioned P.A. to bring them the proposal and not avail. According to the key informant, instead of waiting for the proposal, the tannery provided the logistic support to the D.A.s and started the work. As indicated in Annex (E) that shows the nursery site preparation within the tannery compound, surprisingly, the buying of polyethylene tube with Birr 2068 is a risk (buying without collecting five proforma) taken by the tannery to provide the seedlings on time was appreciable. It could also suggest that, if the tannery got an appropriate imputes, they could have driven the wheel in sustainable manner. It may indicate how far they went to be practical in the environment issue. However, the activity should be based on an approved budget and plan in order to be effective and efficient.

Despite the aforementioned good initiation, the result indicated the presence of low level of communication between the tannery and the nearby community. Due to the existence of negative externality that affects the nearby community health, the residents lost their hope and built an awful negative perception on the tannery. The finding on the positive externality created by the existence of the tannery contradicted with the ECPC and external certifier report that assured the old man's saying. It also indicated the low level of enforceability of existing environmental regulation to command and control the tannery in its activity.

5.2. Stakeholder Analysis

This section aims to obtain a more profound insight into the authority influence and/or support of stakeholder in relation to implementation of ISO 14001 in leather sector in general and ETSC, in particular. The examination focused on integrated environmental management and bore an advice on how to approach a proactive way to effect the ecofriendly development. As a result, managers can concentrate their attention on the stakeholders that really matter for EMS development and stakeholders can avoid inconsistency and duplication of effort that would enable to adjust their policy and strategy. As a result, stakeholders could be more effective in their regulatory and legal entities function to encourage organization progress towards sustainable business development (Wilson and Sassivell, 1999; Bakker and Nijhof, 2002, Bremmers *et al.* 2006).

5.2.1 Stakeholder Categorization

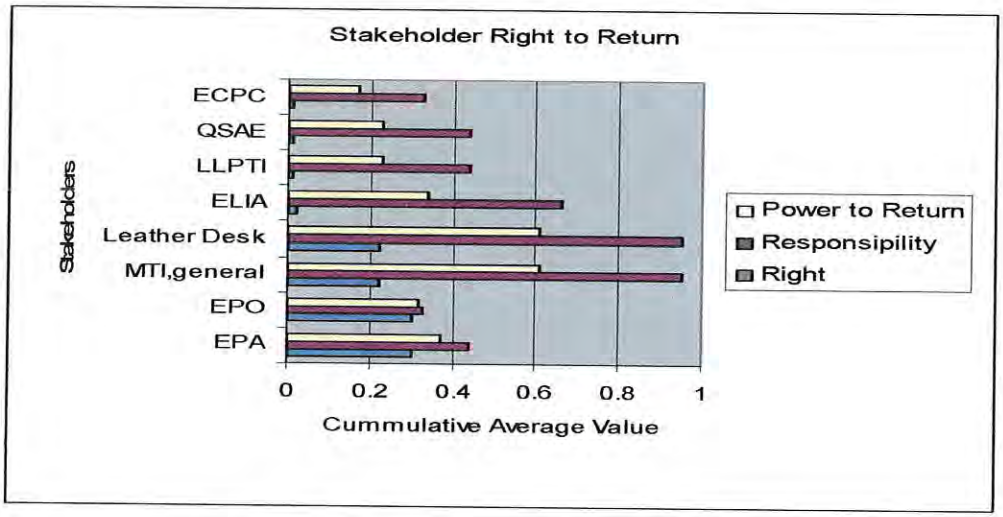
With respect to a disposition right on implementation of ISO 14001 in the leather industry, government authorities (to permit or deny) licenses, audit and monitoring environmental performance are considered. As shown in the following Figure 9, based on average weighted cumulative effect of values, federal and regional EPA and MTI have in general at higher but equal strength of exclusion of rights. It is due to, first; both federal EPA and regional EPO did not have an approved instrument or guide on the command and control regulation (especially on pollution load of industrial effluent).

However, according to key informant of federal EPA, pollution prevention head, the authority believes that there is a need to compliment the polluter payer principle (FNG, 2006b) through inside pipe approach, mainly EMS. To this effect, the Authority submitted to Prime Minister's Office the provisional pollution load standard that includes the tannery effluent limit at the end of 2004. After approval, it will give a five year grace period (believed to be in the year 2007-2011), to allow firms to take a reactive measure to implement ISO 14001. The newly established firms will be guided to implement from the very beginning. It was aimed to give a common platform for old and new firms to be proactive. Unfortunately, the draft standard has not been approved yet, hence, the federal EPA scored relatively lower than expected.

Second, the regional EPO (Environmental Protection Office), that shared the abovementioned hindrance, became equivalent with the right of federal EPA as a result of its engagement in

monitoring environmental performance (i.e. federal EPA focuses on Auditing). Third, MTI was equivalent in right with EPA and EPO because most of the existing firm licensing and withdrawal activity are under its authority. Having similar right indicates the low level of exclusion (protecting) right on environmental matter by the aforesaid organization. These findings confirmed the argument of Vedeld (2004) that asserted low level of exclusion right are desirable when enforcement costs are high, value of resource is low (abundant) and level of conflict between users is low. However, the study is in line with the existing blurred duties and responsibilities which are known as the causes of loopholes for embezzlement or free riding (Steerner, 2003 and Callan and Thomas, 1996). The existence of free riding could affect the reputation and accountability of the authorities and the competitiveness of the sector.

As indicated in the Figure 9, with respect to right and responsibility, authorization of the actor (Vedeld 2004 and Bremmers *etal.*, 2006) MTI in general and its Leather Desk in particular were the predominant or primary stakeholders followed by federal EPA. The regional EPA was the least bearing responsibility in the category that exhibited as hindrance when it carried out its duties effectively. In addition, one can understand from the figure that LLPTI and QSAE, both are under MTI, have less but equal authority in implementing ISO 14001 in the leather sector.



Sours: Field work, 2007

Figure 9: Stakeholders Right to Return

The former aimed to give support that range from technical training, research and development to consultancy service. The latter adopted the ISO 14000 series standard as national standard.

QSAE's aimed to support the export oriented strategy of the country by implementing management system such as quality (ISO 9001 or TQM), laboratory (ISO/IEC 17025), food safety (HACCP) and environmental management (EMS 14001) to enhance the efficiency and facilitate the uprooting of *'non tariff barrier'*. Both have medium but direct duty and responsibility to trigger and encourage the development of the sector. As indicated in Bremmeers *et al.* (2006:3), they *'provide the playing field, the ball and the referee in the company's effort to develop EMSs'*. Moreover, ECPC (partly governmental) and ELIA (non-governmental) were on the lower status as compared to right and responsibility vested from governmental hierarchy. However, the association (ELIA) had right and responsibility that originate from its legal status, aim of establishment that gave an equal status with federal EPA. Moreover, ECPC, which considered EMS, a self imposed strategy to attain sustainable diffusion of prevention of pollution, endowed a resource and has exposure to implement ISO 14001, which was equivalent to those government delegates, LLPTI and QSAE.

Based on the above analysis on implementing ISO 14001 in leather industry, hence, MTI in general federal EPA, the Leather Desk of MTI and regional EPO are primary stakeholders in ranking order. In addition, ELIA is an intermediary because, as stated in Bremmers *etal.* (2006), it is a legal entity created by the tanneries (including ETSC) and leather product manufactures. QSAE, LLPTI and ECPC were found as secondary stakeholders. In the next discussion, based on the above categorization, the implication of the above analysis and the level of influence and support stakeholders exercise on the sector will be presented.

5.2.2. Stakeholders Influence and Support for the Implementation of ISO 14001 in the Tanning Sector

5.2.2.1. Primary Stakeholders

Federal EPA and Regional EPO: play similar role that stem from their respective rights. They differ on the focuses of duties. The federal focuses on policy issue and environmental auditing while the regional emphasizes in follow up and monitoring. Therefore, a contrastable difference will be discussed here.

According to key informant from the federal EPA, the authority incorporated a plan, based on PASDEP, to facilitate prevention of pollution strategy and utilization of waste through industrial simulation in 2006. The authority identified six sectors that include leather sector, and started giving training on EMS. Priority was given for most potentially polluter industries, including tanneries. According to the key informant, the above said grace period was not only aimed to give time for developer but also to the authority to build its own capacity on integrated environmental management system. It includes among others, to have own accredited laboratory (human and infrastructure), to have a capacity on system inspection and auditing and to appreciate the building of environmental department in every industry. According to the key informants, the abovementioned actions enhanced the authority's support to the sector and facilitated court decision and enforcement.

When asked to suggest on the low level of the authority performance as compared to the time of draft proposal-submitted in 2004, the key informant indicated that, they were not putting off their effort. The evidences raised during the discussion were, the Authority conducted a forum to share experience between those implement a practice integrated environment management (including ISO 14001) and others that did not. It was aimed to encourage those implementing the proactive and convince and arouse those that were not. It has also prepared training manual on EMS and planed to start training on the prioritization bases. Besides, it conducted environmental performance audit and communicated recommendation with mitigation measure to the firms under consideration.

However, the constraints raised by key informants were the absence of regulatory instrument that provides the framework to attaining the resource and guide to obey the law to fine otherwise (*'carrot if not the stick'*). In addition, the regional EPO is blamed for its office levels authority that contradicted with the service it aimed to provide. And according to the regional EPO key informant, they frequently acquired new firms EMP and their EIA, but all refused. The finding contradicted Bremmers *et al.* (2006:12) assertion that *'lower governmental bodies are normally more influential on the day-to day basis'*.

On contrary, different literatures indicated regulatory compliance requirements as prerequisite for the enforcement of environmental performance of organizations (Callan and Thomas, 1996;

Sterener, 2003 and Gunnigham, 2007: 200-229). Therefore, the abovementioned findings of low level of power of the office that indicated the impact of government agents in the implementation of environmental public policy was almost nil. In addition, the low level of human resources capacity was the constraints raised by the key informant during the discussion. For instance, from the required 17 experts in pollution prevention department, only 6 (35 percent) experts were on job to perform the required duties. Similarly, the Oromia EPO has 3 (100 percent of the structure) experts assigned to cover the largest region in the country. The identified reasons in federal EPA were unavailability of required professionals at first degree level and small scale of the salary to compete and employ from the current market. Lack of budget due to absence of legal framework hindered to obtain implementation capital (human, financial and infrastructure). However, it was believed that the incorporation of the authority's plan in PASDEP could bring a change on the matter.

The above finding clearly showed how lack of legal framework jeopardized the authority's effect. When asked about the existence of advantage of EIA proclamation for new tanneries, the informant wanted to say that the authority made it clear that EAI approved by the federal EPA will be followed by the federal EPA and those EIA approved by regional EPO will be followed by themselves. It was aimed to facilitate their service and avoid developer complaint and duplication of effort. As the key informant's argument, *"EIA, theoretically a pre-project and a planning issue. But, most of 'EIA's' that requested for the authority approval are of those who started operating"*. The finding could demonstrate that most of the new projects that are operating were not judged for proactive environmental consideration prior to action. This implies that first, at least the development activities were not enjoyed at planning phase mitigation that has potential to enhance their efficiency. Second, the existence of loopholes for free rider and low level of cross sectoral cooperation. This finding confirmed the existence of free riding due to equal right that supports the study argument on the matter.

According to the key informants, the Oromiya EPO requested environmental management plan of EIA of new developer in general and new tanneries staring building in Mojjo town, in particular. All refused to provide. In addition, the office attempted to insist and obtain the functional tanneries in Mojjo to submit their environmental program that includes waste treatment plant but it brought political interference as it were *'creating a problem to investor'*. Absence of laboratory

and low level of contact created the gap that exacerbated the problem. The result clearly revealed the level of enforceability of existing environmental laws and indicated the need for appropriate framework that should assist the federal EPA and the regional EPO.

To the request on cross sectoral issue, the key informant in federal EPA stated that those who are subjected to release their effluent to water bodies are required to apply for a similar approval from EPA and Ministry of Water Resources. As indicated in Vedeld (2004), the creation of this kind of contested right and responsibility could affect the effort of greening the developer. It also exhibited the existence of duplication of effort between cross sectoral issues which might be the cause of the abovementioned embezzlement that created the free-riders. Consequently, the competitive business environment got affected.

Generally, the relationship and dialogue between EPA and operating firms were not backed or governed by regulatory instruments such as provisional standard. It becames a source of ambiguity on rights and responsibilities of governmental bodies and legal entities. As indicated in different studies, the abovementioned blurred responsibilities of the stakeholders affected capability or ability to realize their goals (Vedled, 2004) that include influencing greening of firms (Bremmers *et al.* 2006). Moreover, the absence of full-fledged professionals (in number and competence) in the EPA diminished the necessary precondition for the frequency and clearness of information provision to the industries (tanneries). It also negatively affected the capacity to audit and/or surveillance to evaluate environmental performance that could serve as a feedback to maintain the implemented system.

In turn, the evidence exhibited low level of support the tanneries obtained from the authority. The above result was also similar with the finding reflected in the discussion held with the ETSC's EMR. The EMR said, *'we need actual support through training and information rather than having a paper that plans for a number of firms that will be certificated in ISO 14001'*. Nevertheless, the authority motivated those who implement ISO14001 by recognizing them to explain and share their environmental performance experience in the aforementioned workshop. The finding on the existence of recognition environmental consideration of firms in EPA could be counted as good start of motivation. Besides, the use of positive incentive (laxed control and recognition) and negative incentive (withdrawing licenses and tax advantage, tightened control or

subjecting to greater regulatory scrutiny, negative publicity and fines or penalties) (Bremmers *et al.* 2006) were not exercised. Therefore, EPA's, as environmental legitimate, regulatory or monitoring body, activities to influence, cooperate and support the greening of managerial behavior were minimal.

Ministry of Trade and Industry (MTI), and Leather Desk: According to the key informant who was Head of Leather Desk under Ministry of Trade and Industry (MTI), the ministry clearly indicated its demand from leather industry on the Master Plan of the sector in 2003. The master plan aimed to follow a top-down pull approach that guides the sector to export finished (value added) products. The approach in turn influenced the tannery to be effective and efficient in providing raw material. To carry out responsibility, according to the key informant, the ministry decided to enhance the department's capacity to a center level that will be implemented in the near future. One can infer from the abovementioned result that the present human resource development (number and competence) of the department is low and in consistent with EPA and would have similar implication that would demand the urgency of implementing the decision.

Based on the master plan, the very demand communicated to the members of the sector is the ministry's plan to reach a 98 percent finished product export before December 2008. As a result, the sector has been supported in the area of macro economy, raw material and capacity building toward quality and marketing management in general. According to the Desk Head, the specified and available resources were building the capacity of LLPTI to provide technical human resource development for the sector. It indicated the sector could gain technical competence, which is a mandatory requirement in developed world market (Lowsone, 1997 and Wilson and Sassevelle, 1999). It also provided training to sector from known countries with reputation in the area (especially from Italy and Germany), with the help of donors and bilateral agreements. The duration of provided training ranged from five-day to two month in order to transfer their knowledge and skill. In addition, if firms exhibited the need for foreign expertise, they would assure 2000 USD salary per month for two year.

The Ministry was covering the cost up to 80 percent when they participated in trade fair in order to encourage the sector. It enabled them to access joint ventures and examine their comparative and competitive advantage. As shown in Wilson and Sassevelle (1999), it could be a chance to

observe competitor's performance that serves as benchmarking criteria (Wilson and Sassileel, 1999 and Zairi, 1996). Besides, the sector has given priority in getting loan (a 30/70 grant i.e. for 30 percent liquid money collateral, it assured 70 percent loan). *'When the sector claimed evidenced alliance, we developed a mechanism to dialogue and negotiate with financial institutions, in order to play a facilitation role'*, according to the key informant. There is also 100 percent tax exemption for upgrading technical capacity. In addition, paid VAT (Value Added Tax) for raw material will be returned when they export products, as promotion incentive. Moreover, every two months, the members of the sector have met the State Minister of Industry and Trade to raise the issue and smoothen the relationship.

For the absence of strong support and issues surrounding environment and EMS in the sector, the key informant argued that the emphasis given to technical upgrading and human resource development, in one way or another, could contribute to pollution prevention. When interrupted how far, the key informant indicated that, the ministry could reactively provide assistance for self initiation on the issue. The informant assured that direction was given to members of the sector and that the availability of fund from World Bank was not secret. The aforementioned fund, *'Match Grant'*, aimed to cover upto 70 percent of the cost for the proposal that objectively complies with the basic requirement. According to the informant, at present, enterprises have started inquiring and using the fund to cover their cost for purchasing BAT and consultancy service for quality and environmental management system.

The reason for the aforementioned finding on unutilized support by the sector could be the need to unequivocally fulfill the donors' environmental requirement and the sector commitment (WB, 1998 and Owen *et al.* 1998). Even if it was not known how effectively the abovesaid support was provided, as one aim of the stakeholder analysis (Vedeld, 2004), the result identified the ministry as major resourceful area where member of the sector are potentially qualified as user or extractor. However, as compared to technical support, the plan to reach full level of value added export, to boost production capacity of the sector three to five times within the next five to ten years and to considered aggregated consequences of environmental impact, the sayings and deeds of the ministry on environmental issues need to be significantly improved.

When asked about the existence of environmental requirement from developed world market as a challenge or as its common name *'non tariff barrier'*, the key informant replied that the ministry has not received such kind of compliance. The commented reason was most of the export marking activity was carried out by the industries themselves. For the interruption by raising the issue of article on title *"The Green Water kills the Green Animal"* and its consequences on ETSC's England market, the desk was not aware of it. The finding exhibited, first, the existence of information gap or absence of channel to pass information to the desk on environmental challenge firms' face in international market. Second, most of the tanneries export a semi processed raw material pickled and wet blue (NBE, 2006 and ELIA, 2006), that avoid most of waste in the exporting country. The result could imply that the products are not subjected to requirement at most or the importer (developed world manufacturer) glared by reaped economic gain (comparatively and competitively) from semi finished product.

However, as a result of value adding activity, the sector will be required to use different inputs and technologies that include the suspected inclusion of blacklisted and banned chemicals (EPA 2004 and UNIDO, 2000). In addition, the 1991 European Economic Commission directives restricted the usage of chemicals such as azodye and PCP among others and put limit on heavy metal (Lead, Mercury and Cadmium) in painting of leather. The EC also banned the purchasing of Hexavalent Chrome containing leather for vehicles inputs on the market after June, 2003 (Ha, Noi, 2003). Hence, an exacerbated and stringent challenge could be expected from developed world market in the near future if stakeholders stick to the December, 2008 plan. It is plausible to assert that the sector exhibited low level of precautionary measures or absence of preparedness for the forthcoming challenge. Therefore, it requires first a reactive then a proactive mitigation measure.

Surprisingly, the ministry has a documented and communicated (the ELIA representative, ETSC's EMR, and experts in the Leather Desk assured it) negative incentive declaration. The document stated December, 2008 is a due date to use the abovementioned positive incentive for those who want to export semi processed hides and skins. According to the key informant, until the stated period, the ministry aimed the sector to reach 98 percent of value added export. And for the remaining two percent export of semi finished product, a limited short period will be given. In addition, for those who want to export beyond the limit, the procedure not only denied the

abovementioned positive incentive but also levied tax. According to the key informant, the desk reported the performance of the action plan that indicated encouraging achievement.

However, there was no program in the plan or conceived as option that aimed the agglomeration of leather industry to pool common resource. It included waste treatment plant, modern store, stock market of input and simulated the main product and byproduct. As indicated in publication of GE (2001) and UNIDO (2002), even if it is costly, the exercise is began in Italy (Santacrout) and Turkey (e.g. Istanbul, Izmis, Bursa, Bolu, Gaziantes and Uska) and transformed to Egypt (Badr City) and Tunisia Via donor support (EC is the major). For instance, in Mojjo town, according to the regional EPO, there are four operating tanneries, three have started building infrastructure and five have taken investment license in the sector. From the operating four, only one has waste treatment plant. Therefore, leather industries are agglomerating in the town without necessary infrastructure.

Finally, on the discussion on low level of cross-sectoral collaboration and the existence of personnel misperception towards environmental concern as it were *'a luxury or anti development'* in the ministry, the key informant argued that it is the ministry's duty to cooperate. As per the discussion, the advantage *'includes enhancing efficiency and competitiveness in international market'*. The key informants claimed, as a cause of deficiency in actualizing the principle, low level of capacity (human and financial); low level of commitment to carry out responsibility that includes environmental awareness and training to change the misconception; and attitude of externalizing one's own inefficiency were mentioned as reasons, among others. Hence, the above stated evidence could be arguable as cause for the lack of cross-sectoral cooperation.

5.2.2.2 Intermediary Stakeholder

Ethiopian Leather Industries Association (ELIA): According to the key informant, the representative of the association, 90 percent of the sector's problems were associated with raw material (hides and skins) quality deterioration. The sector also faced a price increment in raw material. As a result, the tanneries have unsold wet blue due to deterioration of quality with value of production cost of Ethiopian Birr 7 million. Nevertheless, the key informant continued the achievement was obtained in the form of a proclamation on the matter, after ten years advocacy.

The proclamation was about to be lost due to the ignorance of the Ministry of Rural Development and Agriculture. However, this issue was beyond the scope of this study.

According to the key informant, the former Leather and Leather Product Corporation played a significant role in developing the sector as it was authorized. As an association, they need such kind of competence and authority entity that is compatible with decentralization. The above finding on authoritative body demand was consistent with the tannery's EMR that confirmed the need. As the EMR of ETSC elaborated, *'the knowledge and skills from scholars and training through the help of the corporation mainly served the sector until the present'* were the same benefits obtained from the former corporation.

Concerning the association's perception of environmental requirement as threat, the key informant responded that they do have member tanneries that could not fulfill the environmental requirement. The key informant argued that if the regulation comes into force, those tanneries will be closed and around 400 employees will become jobless. However, on the one hand, the association participated in the preparation of the provisional standard and aware of the five years grace period. On the other, it repeatedly participated in developed world trade fair with the support of the MTI. Participations were possible in different workshops ('Meet in Africa 2002', 'Meet in Africa 2004' and the recent was CFC Leather Forum and Dissemination work Shop held on, 26-28 March, 2007 at Nairobi, Kenya) and visiting the tannery agglomeration in, at least, Santa Croat (Italy) and Badri City (Egypt). All the abovestated evidences are necessary preconditions to know the growing demand of ecofriendly leather product and drain others' skill and knowledge that include environmental stewardship. Moreover, until early 2007, except participating in the abovementioned *'cocktail'*, no one has proposed its action and demanded support from MTI to mitigate its effect on the environment. But, again, as reported by the key informant, the association is complaining on due dates of value adding because incapable members may exist.

Hence, the association's role was very minimal in making situation easier for members to initiate proactive response for imposition of requirement by public agencies. The result was contrary to the popular assertion regarding association or intermediary as a translator and integrator of public policy in to their organizational business policy and plan (Bremmers *et al.* 2006). The result

could suggest that the ability of the associations was at lower status to improve its capacity to adapt and cooperate not only for environmental issue but also for other public strategic intervention.

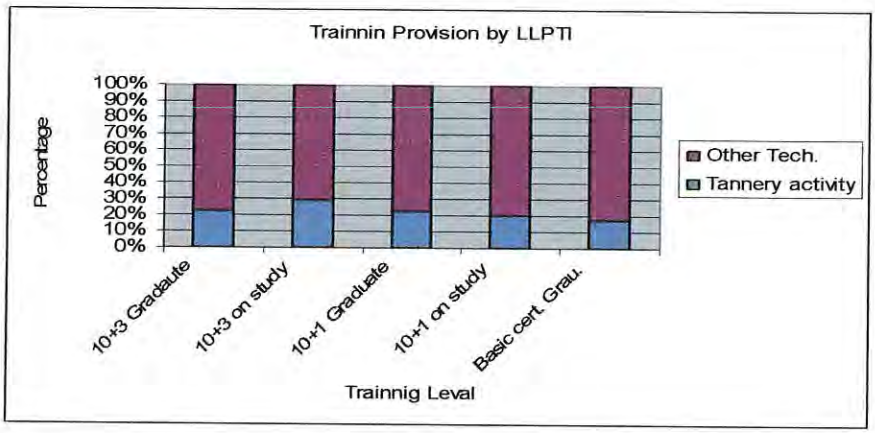
The overall assessment result indicated that, the association's use of dialogue and bargaining power to politicize environment issue as it were *'anti development'* or *'luxury'*, which roared from low level of awareness. This low level of awareness is a potential area of intervention for environmental organizations (governmental and non government) that aim to bring about environmental sustainable behavior. In addition, the low level development and lack of experience on command and control regulation in the country gave ground for the abovestated wrong connotations. Besides, as indicated in Gunnigham, (2007) the consequence of wrong allegation could hamper innovation to the sector. Therefore, the cause seemed that the association, as indicated in Dammenn (1976) cited in Michael (1999:49), *"blinded by the glare of immediate profit, he sees the paper of the past as blank. Whatever the cases, the results are discouraging repetition of mistake'*. Consequently, the abovementioned evidence could serve as *'a wake up bell'* to defend the sector and repute the country's good name in quality, *'Bati Genuen'* in the arena of environmental performance.

5.2.2.3 Secondary Stakeholder

Leather and Leather Product Technology Institute (LLPTI): The institute, under MTI, assessed the training needs of the tanneries and leather product industries and started responding to their demand. According to a key informant from the institute, who is Head of Leather Technology Department, a national diploma program (10+3), higher certificate (10+1) and short term training are provided on leather technology, foot wear technology, leather goods and garments. There is also a special program on tanning process in leather technology. The model in the institute includes tannery activities, effluent treatment plant, footwear factory and Garment factory. Besides, the institute provides training on such facilities as Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM). The programs are tailored in such a way that they specify the curriculum requirement of the abovementioned level that comprises 20 percent theory and 80 percent practice (MI, 2005). The models made the institution unique in the country to demonstrate the basic operational requirement (optimization, safety and control) in tannery

process. Moreover, the institute built its capacity in order to have accredited laboratory on ISO/IEC 17025 to provide acceptable test result for products that are known to facilitate trading in international market. The abovementioned finding on the aim of provision of internationally acceptable test result was inline with Lowson (1999) assertion that could have a potential to minimize the *'non tariff barrier'*.

It was indicated in Belay (2006) and confirmed in MTI (2006) that about 994 students were enrolled at different level between 2004 and 2007. If the trained manpower is absorbed at maximum in the leather sector, it could serve as inertia to enhance sector performance. In addition, as shown in the Figure 10, training provided on tannery activity in diploma, higher certificate and basic certificate were 22.5, 22.8 and 20.5 percent respectively. In addition, it covers 17.6 percent of short term training that range from five days to three months period.



Source: Computed from Belay (2006) and MTI (2006)

Figure: 10 Skills Development Training Program

Nevertheless, with respect to the incorporation of environmental awareness in theory and practical courses, it was found that safety was the only circumstance associated with the issue. Provision of knowhow directly related to prevention of pollution strategy, cleaner production and integrated management system (EMS, TQMS or QMS) are at minimum level. This was a potential area to improve the competence level of students and to enhance the excellence of the institute. As indicated in O' Riord (1995), education is the best known method to inculcate ethical thought and knowledge in the mind of students to bring effective behavioral and cultural change on environmental stewardship.

Besides, one can understand from the above Figure 10, the training provided by the institute to support the tanneries as compared to other programs that coupled with the labor intensive nature of the activity was low. When asked about the provision of information on benchmarking criteria to the tanneries, the key informant indicated that the institution's Research and Development component is at its infant stage. The finding indicated that the institution's support to the sector towards a better environmental performance is insignificant. In addition, paucity of information is similar with the result from the ETSC's EMP. Despite the aforementioned low level of provision of benchmarking criteria or practice, the key informant of the institute responded that they have transferred the knowledge of Indian Vegetable Tanning (that avoids inorganic tanning using heavy metal such as Chromium) to all tanneries. As a result, one tannery started the vegetable tanning.

According to the key informant, the enzymatic unhairing and its advantage was communicated to all tanneries in the country but no one adopted it. The result conformed to ETSC's EMP that contains information about the hesitation of management decision on the matter and the assertion of laggardness of the sector in the previous discussion. As indicated in ECPC (2002), the sector is characterized by the prevalence of lack of confidence on new methods. Generally, the result obtained from the above discussion implies that a lot has to be done to bring a visionary environmental performance (Wilsone and Sasseville, 1999 and Zairi, 1996) to the sector.

Quality and Standard Authority of Ethiopia (QSAE): the authority under MTI has EMS related directorates of Standard, Quality Promotion and Training and Quality Certification. The standard directorate adopted an international EMS standard (ISO 14001:1996) as ES ISO 14001:2001 and made a voluntary national standard. It also adopted all standards of ISO 14000 series as national standard that include the guiding standard (ISO 14004:1996) and Environmental Performance Evaluation standard (ISO 14031:1999) among others. QSAE is also preparing a national standard that relates to environment in working area and safety. The training and promotion directorate has an experience in training, initial gap analysis and supporting the implementation of ISO 9001 (QMS) in Dashen Brewery Share Company (DBSC). As indicated in opportunity discussion, DBSC could benefit from compatible element of QMS and EMS.

At present, the directorate is supporting the textile and leather industries to implement ISO 9001. It also started training on HACCP (a food safety management) and ISO/IEC 17025 a laboratory management system in the year 2005. QSAE has been giving training on QMS and TQMS starting from 1996 and ISO 14001 staring from 2003. However, for the last two years (2005 and 2006), there was no training program on ISO 14001. According to the key informant from the abovementioned directorate, the directorate has been supported partly by newly assigned employees from other directorates, due to the turnover of six experienced staff between June to December 2006. Among the expelled, two were internationally certified system auditors and three were experienced senior experts who served the department for more than eight years. However, the mere existence of experienced personnel did not enable the authority's departments to implement and certify in their respective needs, at least the laboratory. As indicated in Lowson (1999), technical requirement such as product test report from accredited laboratory should be fulfilled unequivocally to penetrate the international market.

Therefore, the obtained result demonstrated that the authority was unable to make its department a pioneer in implementation and certification to their relevant system. This could imply the existence of under utilization of resource in the authority. In addition, even if the adoption of the international standard eased both access and cost of information, so far, no one communicated the existing information. This revels that the authority made invisible offer to be utilized, hence, it could be a more efficient option if the authority adopts the newly ISO 14001:2004 standard, that has a compatible feature with ISO 9001:2000(ISO, 2004a).

Ethiopian Cleaner Production Center (ECPC): As indicated in power analysis, the center took the initiative to implement ISO 14001 as a strategy to introduce cleaner production sustainably. The finding is in harmony with studies that established a link between certification of the standard and economic advantage since the certificate can be used as *"a green passport"* in international market. In addition, the abovementioned advantage was one of drives that motivated firms to continuously adopt cleaner technology (Callan and Thomas, 1996; Wever, 1996; Bridgen, 1997; Besterfield *et al.* 2001 and Bremmer's *et al.* 2006). The center aimed adoption process of EMS to be demand-driven. According to the key informant, Deputy Manager of Environmental Service, the center started the advocacy work with the management of export oriented industries. After several negotiations and bargaining's elapsed, as indicated in start up

phase of ETSC'S EMS, a consensus was reached on with eight industries. Among the nominated industries, five (63 percent) were certified on ISO 14001 and complied with the recent audit in January 2007. Two private firms were closed due to financial problem not related to EMS. The Awash Tannery withdrew itself from the program, as it does not have a waste treatment plant.

According to its strategy (a demand driven), the center trickled its effect down to other 12 industries. In 2005, agreement was reached to cover about 40 percent the consultancy and certifying cost of EMS. Among 12 industries, half are successfully implementing EMS, according to the key informant. The rest quarter became out of business and the last quarter failed to integrate environmental issue in day-to-day activity or gave priority to other activities. The center blamed the absence of law and regulatory instrument as a cause; and it is arguable that, as indicated in Callane and Thomas (1996) and Gunnigham (2007:200-229), environmental regulations are known to drive corporate behavior.

When asked about the effect of the intervention in bringing about structural responsibility in the firm, the key informant responded that the center has followed the gradual quality control adoption process. The result obtained from the discussion explained that the aim of the center is to start first with awareness, training and competence. Then, the center will insist on considerations that uplift the structural requirement by evidencing the advantage of environmental consideration to firms. Because, there is no governing law that enforces environmental consideration. The result demonstrated that the sector was expected to follow a century long road experience of QMS (Wever, 1996). The aforementioned long journey was contrary to the chance to leap frog in environmental performance that has been exhibited in South East Asia and China (Beijing Review, January, 2007 and Schylander, 2006). In governmental complimentary influence perspective, the most appreciated effect the center observed was the Privatization Agency effort, according to the key informant. The agency undertook environmental audit and deducted the environmental liability of those industries made available for privatization. The action of the agency was an actual impetus that has a positive implication for environmental consideration in the industry sector in particular and in development activity in general. Therefore, the accountability taken by the government agency would imply that others should follow in a proactive manner.

Responding to the absence of benchmarking criteria, tracking mechanism of performance, evaluation of competence of the worker, and ambiguous comprehension problem, the key informant stated that, ECPC was beginner and does not have the experience on the matter. ECPC accommodated the gap by incorporating the skill and knowledge of two QSAE experts at that time. The result obtained seemed an environmental stewardship that has been overstretched. Besides, as things stand now, imposition of the hard core element of ISO 14001 might create additional fatigue. The consequence might lead to a rejection of the very idea. According to the key informant, the center was subjected to persistent environmental consideration and yet discussions always start with the pervious year's experiment as they were operating under financial problem, obsolete technology, without regulatory drive and in total inefficiency. The obtained results from the above discussion clearly illustrate the challenge the center faced to introduce environmental stewardship.

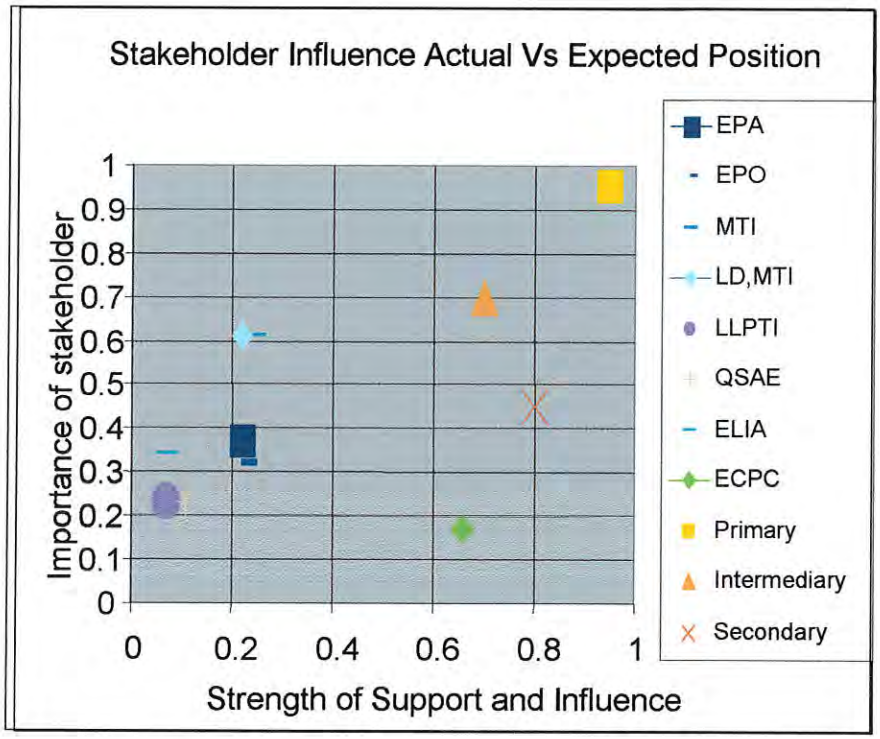
When asked about the existence of certified system auditor in the center, the key informant answered otherwise. As a result, the center shared low level of human resource development. Therefore, there is no evidence, after being certified in ISO 14001, whether to suggest the required competence level of professionals in the center is available to perform system implementation and auditing or not. The obtained result implied that the center's capacity is insufficient to facilitate the proper transfer of knowledge to the implementer and the provision of proper (as per the standard) feedback that could fuel the continual improvement of the intervention. The result also made it possible to infer that from those who do not exercise the building of cultural change towards environmental stewardship via training within themselves could not exemplify and motivate others to follow. As indicated in the case study that was consulted by ECPC, after more than two years of intervention, the exhibited behavioral change toward environmental learning did not exceed awareness creation program. The cause might include that certifying institution was considered as an end by itself. But, it is a means for better performance (Martine, 1998; Besterfiel *etal.*2001 and Stapleton, 2001).

ECPC, as secondary stakeholder, metaphorically, created the playing field of implementing ISO 14001 in the country (Ethiopia). The referee was not known for competence and complimented by rules and regulation to coach the playing. Assistant referrers were not at the right place and time (stakeholders support and influence). The ball was not full of air that has proportional

constituents (multidisciplinary approach). The entrance fee was free to play at the beginning time but still subsidizing two third of its price to create participant belongingness. In order to have a *'fair game'* according to standard, a prepared field with required line and facility and a full aired ball is compulsory. Besides, the assistant referees, specifically primary stakeholder influence, should be in time and place.

5.2.2.4 Summary of Stakeholders Influence and Support

The following figure (11) illustrates the level and scale of influence and support existed and expected to implement ISO 14001 in leather industry in Ethiopia, among stakeholders that were investigated in this study.



Source: Fieldwork, 2007

Figure11: Stakeholder influence and support the implementation of ISO 14001 in leather sector.

The figure (11) depicted, generally, the low level of influence and support existed among stakeholders to implement ISO 14001:2004 in the industrial sector of the country. As indicated in Sterner (2003), the full-fledged involvement of stakeholders is vital for enhancing sustainable business development. Except QSAE, most of the stakeholders under this analysis exhibited low level of human resource development. All primary stakeholders were far behind to exercise their

authority to bend managerial behavior of the sector to improve environmental performance. Despite this fact, MTI and its Leather Desk showed a better position using its vested power to influence the sector. However, to attain its goal, the ministry should pay attention to those inputs banned in 1992 in EC and unecofriendly material declared in WB (1998) that can be used in value adding activity. In addition, even if the federal EPA and Oromiya EPO were not backed by regulatory instrument, the regional EPO exhibited lower authority from the expected duties of monitoring and surveillance. As noted in Bakler and Nijihof (2002), Jones and Hollier (2002) and Gunnigham (2007:200-229), firms are stimulated by governmental regulation and incentives to stick to the requirement and be innovative. By contrast, the absence of regulations instrument might obstruct corporate initiative toward environmental responsibility (Tinsely, 2002; cited in Brimmer's *et al.* 2006) that can go beyond compliance.

As indicated earlier, the association founded out of scars of the lower influencing curve for proactive and reactive public policy should be greatly improved. The finding attested Bremmer's *et al.* (2006) assertion that indicates intermediaries play a prominent role in triggering their member through imposing public demand upon member firms. In spite of the deficiencies, from the secondary stakeholders, ECPC was in better position than the others. LLPTI obtained the springboard that could be favorable to inculcate environmental concern and prevention of pollution strategy on the trainees mind. Therefore, the institute needed to revisit the aforementioned training demand assessment with respect to environmental stewardship and labor-intensive activity in the tannery. QSAE that exhibited lower influence and support for the implementation of the standard in the sector should communicate and exploit the resource at hand. Being a competent authority, it was expected to transfer the skill and knowledge to the sector. Results would suggest that a lot of work remains to be done by the stakeholders to become proactive respondent on environmental issue, which is also a potential area for sustainable development. In the next chapter, concluding remark will be provided.

CHAPTER SIX

6. Conclusion and Recommendation

6.1 Conclusion

ETSC is the biggest tannery in Ethiopia that covers 35 percent of the country's export in the leather sector. Concerning its performance on sound environmental practice, it can be assessed in conformity with ISO 14001:2004 standard. Here, the standard requires 17 parameters to be fulfilled for making the tannery comply with the expected environmental friendly performance. However, this study focused on the main strategies that could take ISO 14001:2004 specification and principle to be practiced. Although the tannery showed considerable effort to enhance its environmental performance, the starting phase of ISO 14001 implementation in the tannery exhibited both favorable and challenging circumstances. The former includes a necessary but not sufficient condition in terms of infrastructure, management commitment and ECPC assistance that offered the enhancement of environmental performance. The later exhibited, among others, the lack of experience in proactive environmental strategies, system development, low level of environmental liability and lack of awareness on the advantage of environmental consideration. Besides, the external motive lacks stringent environmental rule and regulation that could enforce organizations toward sustainable environmental behavior. Hence, the above motives for environmental intervention questioned its sustainability.

The designing phase of the tannery's EMS was started by gap analysis, material balance and formulation of the tannery's environmental policy. The first phase was not comprehensive enough to incorporate the intention and implication of each activity. Therefore, the tannery's initial EMS assessment was lacked a necessary tool to gauge the extent, potential cost and required modification. It was not properly performed due to insufficient training and the abovementioned challenges. As a result, the designing phase lacked the means to apply the tannery's particular regulatory requirement and led to focus not on real environmental program.

The environmental policy of the tannery was not a sound testimony to ease the linkage between environmental aspect identification, significant impact analysis and EMP development that focused on environmental hot spots of tanning activity. The cause and source of waste stream in the tannery's activity was not known in order to reduce or eliminate adverse environmental

impacts. Therefore, the basic tenet of the entire ISO 14001:2004 process, planning phase, was defectful in order to attain a continuous improvement spiral for actualizing the declared environmental stewardship. Besides, the merit of proper planning that seeks out and incorporates prevention of pollution strategy was forgone. The planning phase did not exhibit laying a ground to measure its own achievement in order to first capture the *"low hanging fruits"* and to do the right thing when the *"going gets tough"* (Gravenden, 1999; UNEP, 2002 and SAQI 2002). Therefore, the tannery environmental policy was not a living document to integrate environmental mitigation on its day-to-day activity.

The implementation of the tannery's EMS mirrored its planning phase. The tannery EMS lacks the consideration of all ISO 14001:2004 requirements as a *de jure*, environmental regulation (international and national) as a *de facto* and ecofriendly activity as environmental benchmarking criteria. In addition, the absence of system maintenance and performance beyond compliance through the use of measured feedback that led the tannery EMS seems only a document. Although the environmental management program focused on operational control, incredible results obtained in resource utilization and a success attained at hand that has not been acknowledged. Besides, environmental performance of the tannery exhibited a lot of work remained to follow the hierarchy of prevention of pollution strategy, to have systematic approach and assure the continuity of its benefit.

Although the result obtained in the assessment of cultural building showed a significant achievement in environmental awareness creation, it was not started by assessing the training need of tannery employees. No program existed for enabling workers to control, prevent and know the potential impacts of their deviation from routine activities. Moreover, the aforementioned awareness creation program was not evaluated to confirm the extension of belongingness, responsibility and behavioral change toward environmental consideration. The main cause identified here was the lack of guiding principle in the former environmental policy of the tannery. As a result, the absence of process for institutionalizing environmental stewardship through participation and evolvement led the tannery EMS to be viewed as a separate entity from day to day activity. Hence, the tannery's EMS lacked the imperatives to improve environmental performance and affect the beliefs and deeds of employees toward system development.

The tannery's EMS lacks preventive and precaution measures to avoid the use of banned and blacklisted (not eco-friendly) inputs in the tannery's export product destinations. The above problems could be exacerbated due to the new environmental policy of the tannery and the country's Leather Master Plan aimed to export full level of value added product. Hence, no one has given due attention to avoid and overcome strict regulatory requirement as a result of the use of input that are effective and cheep but restricted and blacklisted in international market.

The tannery's mechanism to avoid remedial action and ensure repeatability of the achievement was at documentation stage. The procedures and working instructions are not benefited from stipulation of operational criteria with hierarchy of prevention of pollution strategy that led the tannery to lack a virtually working EMS that can not be affected by the change of personnel. As a result, the firefighting mentality is highly exhibited in the tannery process. Although the tannery tried to participate in social issue through provision of clean water to the junior school and raise 800,000 seedlings to distribute freely to farmers to *"fight desertification"*, the unmitigated and communicated environmental activities of the tannery that focused on documentation led the nearby community not only hopeless and helpless but also built an awful negative perception towards the tannery.

To this end, the competent and pertinent authorities were not capable to influence and support the tannery in order to contain its significant impact and enhance its positive aspects. The lack of proper environmental regulation and low level of industrialization in the county led the stakeholders to have equivalent right and responsibility on environmental matters. As a result, firm's embezzlement or free riding occurred. It could also impede competitiveness of firms and corporate initiatives that can go beyond environmental regulation.

In spite of the above low level of persuasion and support, EPA started to complement its polluter payer principle through inside pipe approach and MTI made available resources that are opportunities to fuel the sector for better performance. Besides ELIA struggle for better quality hides & skins, LLPTI acted as a spring board to inject environmental conscious professionals to the sector and QSAE made an easy access of national standards on ISO 14000 series. Surprisingly, ECPC were in a better position to support the implementation of ISO 14001 in leather sector with the help of the carrots without the stick.

Although MTI exercised their power to modify managerial behavior and to stick to value adding program, it left out environmental consideration and is not prepared for the challenges that it faces as they experienced the merit of low level of environmental requirement of semi-finished products. In addition, the role of the intermediary, ELIA, influences members to endorse the country's public policy contrary to the expectation due to different interests and capacity prevailed in the association members. The association uses its bargaining power to politicize environmental consideration as antidevelopment hurdle that led to forgo the chance of facilitative role in draining knowledge, skill and experience transfer form bilateral agreements that could enhance the overall performance of the sector.

Finally, the above mentioned stakeholders that are ultimately vital with respect to implementing ISO 14001 in the leather sector were not proactive, integrated and resourceful. They were not information rich and capable to have effective and frequent contact that resulted in lack of power to bend or change to accommodative attitude of organizations' sustainable environmental behavior. The result clearly exhibited a major turnaround in acting and thinking as needed to bring environmental performance to higher stage.

6.2 Recommendations

It is believed that the tannery should select key strategy to maintain achievement and enhance its performance that extends beyond compliance, hence, the following recommendation are forwarded:

- The newly prepared environmental policy should incorporate guiding principles on the nature, scale and type of activities and a desired pollution prevention strategy in order to facilitate significant impact identification. It helps to link and guide the day to day activities within the tannery.
- The complaint of the nearby community should be incorporated in significant impact analysis in order to mitigate objectively. The attempts and results advised to be communicated to nearby community through social constitution such as *Idir* and elderly people to convey information and build common understanding.

- The designing phase of the EMS should incorporate the normative and cognitive implication of system approach, system maintenance, continual improvement and planed management to drain and use feedbacks of its own achievement. It should give a clear set of wittiness that focus on environmental hotspots of tanning activity.
- Competence training should be provided based on need assessment, planning and evaluation. It is believed to create a sense of participation, ownership and capability of employees to prevent and control adverse effects and enhance the achievements.
- The operation control should aim to attain prevention of pollution strategy; preventive and precaution measures and accurate and traceable performance in order to make virtually working system or avoid *'fire fighting mentality'*.
- The tannery advised to enhance its EMS to track its input on environmental performance in general and chemical in particular. Special emphasis should be given for procedure that credited eco-friendly of the inputs through preventing those who were cheep and effective but banned or blacklisted in international market.
- Designate routine work of EMR and WT leader to a capable expert in order to make them have time and assist line employee to overcome the challenge during implementation of environmental program.
- Establish environmental department through training and assigning responsibility to the personnel of the research and development division and quality control or both. This body should deal with proper link of environmental policy, pollution prevention strategy and build environmental stewardship culture.

Besides, it is recognized that for successful EMS implementation, stakeholders' influence and support is vital. The following strategic recommendations are presented:

- The government advised to reconsider the approval of the provisional standard on pollution of industry and provide resource to EPA in order to have a conducive power and built its capacity. Then, the EPA should support and influence the efficiency of the development activity. The abovementioned regulation could give a ground for organization innovation and efficiency to comply with, since the enforcement could prohibit polluters to have unfair competitive advantage over others who handled their waste.

- MTI (Leather Desk) should act proactively to avoid not eco-friendly input and technology in value adding process. It should also encourage the developer to utilize the already available resource. Besides, the ministry should lead and integrate efforts for tannery agglomeration in specific area. The leather industry village, based on detail study and learnt from other countries' experience, shall be established in less sensitive geological, environmental and community area. The village has to be equipped on infrastructure and eco-friendly production center to simulate main-product and byproducts. The center should operate on recovery cost for treating waste and to use saved hair and trimmings for economic purpose. Moreover, incentives should be given to transfer old tanneries and establish new one in the village through funding the transfer cost and giving long tax holidays. Mojjo Town could be nominated and subjected to EIA.
- ELIA, as a development actor, is expected to exchange information and share experience within the members in order to facilitate the actualization of public policy imposition. It is also expected to drain not only experience and skills but also calls joint ventures from developed world in order to enhance the performance of the sector.
- All stakeholders should upgrade the human resource (in quantity and quality), infrastructure and made available a real motivation in order to convey valuable information that could support and influence the developer to mitigate the inefficiencies
- Stakeholders should be integrated to avoid repetition of effort and work together within their differentiation of right to protect their return. They should be rejuvenated to carryout their duties within the expected standard.

Finally, the stakeholders should pay closer attention and actively involve in international relation to transfer technological and eco-friendly management practice to the country. Specially, environmental training and certification demand should be addressed. The government should also play an important role in promoting EMS in tanning process and intensify value added leather export. The tanneries development path way should comply with five pillars of sustainable development. These are sound ecological protective, socially acceptable, economically productive and environmentally just and efficient.

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21. If yes, identify the location, type of industry and lesson learned?

Location	Type of industry	Lesson learned
1. In Ethiopia 2. Abroad	1. Tannery 2. Brewery 3. Textile 4. Chemical 5. Service center 6. Other (specify)	1.On EMS 2.Pollution prevention 3. On certification 4. Other (specify)

22. Did you participate in any workshop prepared by other organization in relation to ISO 14001? 1. Y 2.N

23. If yes, identify
1. Place _____
2. Organization _____
3. Duration of work shop_____
4. Important knowledge acquired (Max of two responds in ranking order)
   I. _____
   II. _____

III Comments and perception

24. Do you feel that, in general, employees need more environmental training?1. Y 2.N

25. If yes, what kind do you suggest if recommendation is requested?
1. General (1) or specific (2)
2. Seminars (1) or documents (2)

26. Do you feel that you would like to receive more training about the tannery's environmental commitments/program? 1.Y 2.N

27. If yes, what kind of training do you suggest if recommendation is requested?
3. General (1) or specific (2)
4. Seminars (1) or documents (2)

28. Do you feel that you receive more environmental training than you would like?1.Y2. N

29. Haw do you evaluate the tannery's job of communicating its EMS to its employees?
1. Excellent 2.Satisfactory 3.Poor

30. Do you feel the tannery needs to improve its environmental training and awareness programs? 1. Y 2. N

31. If yes, which aspect?
1. _____
2. _____

32. If no, why?
1. _____
2. _____

33. Do you feel a part of the tannery's EMS? 1. Y 2.N
33. If yes, how have you participated?
1. _____
2. _____

34. Do you know about environmental champions group or committee on education?
1. Y 2. N

35. Do you know who your departmental contact is for the EMP? 1.Y 2.N

36. Has your department included environmental targets or measures in its 2006/7 business plan?
1. Y 2. N

35. Do you think the environmental targets are appropriate to your job? 1. Y 2. N

36. Which of environmental targets were the easiest to full fill?
1. Those related to prevention
2. Those related to avoiding
3. Those related to reduction
4. Those related to documentation
5. Others, specify

37. Which of environmental targets were the most difficult to full fill?
1. Those related to prevention
2. Those related to avoiding
3. Those related to reduction
4. Those related to documentation
5. Others, specify

38. Do you think the awareness, training and competence component of the EMS will be continually improved in the future? 1. Y 2. N

39. If no, why?
1. _____
2. _____

40. Do you have any suggestions for improving environmental awareness at the tannery?
_____

Thank you.

B. **Interview Questionnaire for Tannery EMR**

Introduction

Hello! My name is Gashaw Tesfaye and I am postgraduate student at the Addis Ababa University. I am a student of Institute of Development Research and am conducting a research on Implementation of EMS based on ISO 14001 in Ethiopian Tannery Share Company. I hope that the research out comes contribute to the betterment of the tannery Environment Management System and further applications. Your kindly cooperation would help me for the successful completion of my thesis/research. So I would like you to answer a few questions.

Interview guide

1. What kind of environmental Management system do you have? Why?
2. What are the necessary policy frameworks you have suggestion that could help to exploit them at maximum level?
3. What are the benefits and difficulties do you experience in implementing the EMS?
4. How do you assess the perception of the management group and workers?
5. Do you have the necessary manpower and financial resources to implement the EMS?
6. How do you assess the relationship of the tannery vis-à-vis stakeholders (client, community, government's competent authorities and NGOs) perceive?
7. Do you have any suggestion in relation to EMS implementation that are not incorporated in the discussion?

Thank you.

C. Quaternaries for House Hold Survey

Introduction

Hello! My name is Gashaw Tesfaye and I am postgraduate student at the Addis Ababa University. I am a student of Institute of Development Research and am conducting a research on Implementation of EMS based on ISO 14001 in Ethiopian Tannery Share Company. I hope that the research out comes contribute to the betterment of the relation ship between the community and the tannery. Your kindly cooperation would help me for the successful completion of my thesis/research. So I would like you to answer a few questions. Your name will not be required and anything and everything that you say will be kept confidentially.

Date:_____
Name of *Gote*: _____

Part I: Identification and basic information regarding house hold head.

1	Household respondents sex	1. Male 2. Female	
2	Household respondents age		
3	Marital status	1. Single 2. Married 3. Divorced 4. widowed 5. separated	
4	Educational status attained	1. Illiterate 2. Grade 1-4 3. Grade 5-8, Grade 9-10,Grade 11-12 and tertiary	
5	Place of Birth	1. Egjersa 2. Out of Edjersa or other place	
6	How long have you lived in this area? (in years)		
7	Size of the family	Male	
		Female	
		Total	
8	Specific number of children		
9	Occupation of house hold head	1. In the tannery 2. Unemployed 3. Farmer 4. Business	
10	The roof of the house for the interview is made of?	1.grass/strow 2. iron 3. others (specifies)	
11	Estimated monthly income if possible	1. <250 2. 250<500 3. 500-1000 4. 5<1000	

Part II: Health condition of the household

1. Do you experience (even in your family member) any health problems? ☐
   1. Yes 2. No
2. If yes (for Q.1), would you tell us about the type of the symptom, the family member that shown the symptom and how often (frequency) of occurrence?

Member of the family that show the symptom	Symptoms	Frequency
1. head 2. spouse 3. childe age less than 5 4. age between 5-15 5. age between 16-65 6. age greater than 66	1. Coughing 2.Congestion of nose, sore throat or shortness of to breath (siness) 3. Head Ach 4. Eye irritation, skin problem 5. Dehydration 6. Other (specify)	1. Daily 2. Every other day 3. Rarely 4. Never 5. Other (specify)

3. Which of the above symptoms do you think are related to?
   a. the emission of solid or liquid effluent _____
   b. gaseous second emission_____
   c. the use of river water for domestic purpose _____

4. Which of the following disease have been there in your family? Identify the three most diseases that you think related to emission of the tannery?

No.	Type of Disease	1. Yes	2. No	Ranks
1	Asthma			1st
2	Chronic Bronchitis			
3	Lung Cancer			2nd
4	Repeated dihhairoae			
5	Skin problem			3rd
6	Others (specify)			

5. Do you or your family member go to health center for treatment in the last three month? ☐
   1. Yes 2. No
6. If yes for Q. 5, would you tell the reasons?
   1. Breathing sickness 2. Digestion sickness
   3. Headache 4. Skin and eye problem 5. Others (specify)

Part III. Social Issues

1. Do you have any problems in relation to the tannery emission and effluent? ☐
   1. Yes 2. No
2. If for Q. 1 answer is yes, would you tell us the cause of contact, the intensification of the problem seasonally and daily and problem of household activity affected? (multi responsible is possible)

Cause of contact	Season	Daily	Activity affected	Rank order
1. Smell and suffocation 2. Land fill 3. Effluent water from the tannery 4. Others (specify)	1. dry or windy 2. wet(calm) 3.occasionally (specific)	1. morning 2. mid day 3. afternoon 4. night	1. Cooking 2. Meal time 3. Sleeping 4. Children playing 5. Business activity 6. Others (specific)	1. First 2. Second 3. Third

3. Have you noticed any change in the last two years in relation to emission and effluents? ☐
   1. Yes 2. No
4. If yes, how do you perceive the change? ☐
   1. Positively (Good) 2. Negatively (Bad)
5. If positive changes were perceived, do know the reasons? (Max. of two responds in order of priority) 1. _____
   2. _____
6. If negative things are perceived, what kind of measure do you suggest if recommendation is requested?
   1. _____
   2. _____

7 Do you leave this area if you got a chance to move to another area? ☐

1. Yes 2. No

8 If yes, Why? (Multi response is possible) ☐

1. Due to tannery emission
2. Due to absence of high school or other service sector
3. For searching better life
4. Others (specify) _____

9 If no, Why?

1. _____
2. _____

10 Do you have a plan to leave due to emission of the tanners? ☐

1. Yes 2. No

11 Have you ever discuss on issues related to the emission and effluent of the tannery? ☐

1. Yes 2. No

12 If yes, would you tell us with whom you discuss and the level of agreement reached? (Multi response is possible)

Type	Frequency	Rank order
1. Tannery worker 2. Tannery managers 3. PA leaders 4. *Idir* member/leader 5. Neighbors, friends 4. Others (specify)	1. Once 2. Two to three time 3. Always	1. Raising the concern 2. Discussion 3. Awareness creation 4. Consultations 5. Negotiations 6. Others(specify)

13 If the answer for question 10 is No, what are the reasons? (multi response is possible)

Reason	Rank order
1. No problem existed 2. No one insists 3. Could not bother 4. Not knowing where to go 5. Lose hope to bring change with discussion 6. Other (specify)	1. 1st 2. 2nd 3. 3rd 4. 4th 5. 5th

IV Attitude and Perception Regarding the Environment Program of the Tannery

1. Do you know about the environmental management activity done in the tannery? ☐

1. Yes 2. No

2. If yes, how do you know? ☐

1. Informed by leaders of P.A. 2. Informed by D.A.s
3. Informed by tannery worker 4. Informed by your friends 5. Others

3. Did you participate in any environmental related activity implemented by the tannery in the last year? ☐
   1. Yes 2. No
4. If yes, did you have an opportunity to offer your input? ☐
   1. Yes 2.No

5. Do you believe that, in general, most of the community aware of the tannery's environmental programs? ☐
   1. Yes 2. No
6. Haw do you evaluate the tannery's job of communicating its EMS/environmental program to the nearby community? ☐
   1. Excellent 2.Satisfactory 3.Poor

7. Do you feel the tannery needs to improve its EMS/environmental program? ☐
   1. Yes 2. No

8. Are you familiar with the constitutional right of citizen to leave in clean area? ☐
   1. Yes 2. No

9. If yes, haw did you became aware of citizen's right? ☐
   1. Radio 2. Television
   3. Kebele meeting 4. Social Institutions (*Idir, Debo*, etc) 5. Other, specify _____
10. Do you know where one can get consultation on environmental concerns? ☐
    1. Yes 2. No

11. If yes, mention the most two organization/places?
    1. _____
    2. _____

12. What do you think or suggests the tannery should do to improve the existing conditions? (Max 3 responded in order of priority)
    1. _____
    2. _____
    3. _____

13. What do you think or suggests the most important think the government should do in relation to its relation ship with the community? _____
    _____

14. Would you like to add anything more?
    _____
    _____

Thank you.

D. **Checklist of issues for Focus Group Discussion with the residential of Edjersa Peasant Association (Bissan and Bissana Bekele *Gote*)**

I. Introduction.

Hello! My name is Gashaw Tesfaye and I am postgraduate student at the Addis Ababa University. I am a student of Institute of Development Research and am conducting a research on Implementation of EMS based on ISO 14001 in Ethiopian Tannery Share Company. I hope that the research out comes contribute to the betterment of the tannery Environment Management System and further applications. Your kindly cooperation would help me for the successful completion of my thesis/research. So I would like you to answer a few questions.

II. Interview guide

1. Perception toward the tannery.
2. Perceived incidences/effects on human, animal or land caused by the tannery.
3. Self initiatives and there consequences to deal with the environmental condition of the residential living and working condition in respect to the tannery, PA or government body.
4. Perception toward there citizenship right (constitutional right) to live in clean area. Implementation of these rules and policies (enforceability)
5. Direct benefit the community obtained so far from the tannery positive externalities (employment, clinic) and negative externalities.
6. Perception toward preventive and precaution measures that could be taken/ considered by the tannery, PA and the community themselves to avoid or minimize environmental problem.
7. Suggestion for future action.

Thank you

E. Interview Guide or Checklist for key Informant of Stakeholders

Introduction

Hello! My name is Gashaw Tesfaye and I am postgraduate student at the Addis Ababa University. I am a student of Institute of Development Research and am conducting a research on Implementation of EMS based on ISO 14001 in Ethiopian Tannery Share Company. I hope that the research out comes contribute to the betterment of the tannery Environment Management System and further applications. Your kindly cooperation would help me for the successful completion of my thesis/research. So I would like you to answer a few questions.

I. Check list of Issues for Interview with EPA, Pollution Prevention Department Head and EPO Pollution Prevention Department Expert

1. Evolution of approaches toward industry and environmental protection in Ethiopia.
2. Environmental prevention proclamations: enforceability, effectively and efficiency.
3. Perception toward end-of-pipe Vs inside pipe approaches
4. Perception toward command-and-control Vs voluntary agreements, initiatives or standards
5. Is there any strategy or mechanism established concerning pollution prevention and natural resource and environment management of industries (tanneries)?
6. What are EPA's demands on leather industries?
   - How the authority communicate (frequency and quality information)?
   - How the industries urgently meet?

- How EPA perceive the availability of resource (financed and human) to meet/ compliant the required demand?
- Is there mitigation measure/ alternative presented to tanneries (industry)?

7. Perception toward influencing industries:
   - Positive incentive: subsides, tax advantage, capacity building, laxed control and etc
   - Negative incentives: withdrawal of license, tightened control and etc
8. Relationship with sectoral and cross sectoral institution and lower government bodies which are influential in day to day activity.
9. Perception toward cooperation to industries (tanneries)
   - There relationship and dialogs
   - Clearness of information exchange
   - The consistence of public polices toward environmental issues (investment licensing for example).
10. Is there any opportunity for new tanneries? i.e. In addition to new technology such as conducting EIA that includes EMP before the commencement of the project (relationship with related sectoral and cross-sectoral) i.e. Is there any loophole for embezzlement or free riding?
11. Is hindrance existed to implement EMS due to sticking to the established police?
    - issue that require finance
    - issue that do not feet with strategy of business or structure (Organizational and technological).
12. Organizational capacity of the authority (H.R.):
    - Frequency of visit
    - Information transfer
    - Monitoring complains
    - handling communication with community
13. What are the main hindrances of moving from end to inside pipe in pollution prevention?
14. Is there any suggestion, proposition or anything else, that your think is not incorporated in the discussion?

II. Checklist for Discussion with MTI, Head of Leather Desk.

1. Policy/strategic interventions that have been issued and implemented to address
   - industry(special emphasis on tannery) and pollution prevention and natural resource management.
   - international trade ('*Non Tariff Barrier*' and WTO effects)
   - to exploit endowed livestock resources (hides and skin) exhaustively.
2. Perceptional and action toward *Non Tariff Barrier* in DC market (technical requirement are mandatory and voluntary standards are responds for consumers satisfaction; growth environmental concerned citizen and MNC with influential supply chain strategy).
3. Perception toward command-and-control Vs voluntary agreements, initiatives or standards
4. Perception and act toward the structural (machinery) and human resource capacity with respect to:
   - pollution prevention
   - trade requirement at international market
   - EMS development
5. Perception toward influencing industries (tanneries):
   - Positive incentive: subsides, tax advantage, capacity building, laxed control and etc
   - Negative incentives: withdrawal of license, tightened control and etc
6. Relationship with sectoral and cross sectoral institution and lower government bodies which are influential in day to day activity i.e. Is there any loophole for embezzlement or free riding?

7. How frequently contact tanneries in order to provide information and monitor compliance with requirement?
8. Perception toward cooperation to industries (tanneries)
   - There relationship and dialogs
   - Clearness of information exchange
   - The consistence of public polices toward environmental issues (investment licensing for example).
9. Perception toward the extent of environmental pollution created by industries, especially leather sector
10. Existence of bilateral agreement for knowledge, skill and technology transfer (NGO, such as UNEP, UNIDO also included).
11. Organizational capacity of the authority (H.R.):
    - Frequency of visit
    - Information transfer
    - Monitoring complains
    - handling communication with community
12. What are the main hindrances of moving from end to inside pipe in pollution prevention?
13. Is there any suggestion, proposition or anything else, that your think is not incorporated in the discussion?

III. **Check list of issues for discussion with QSAE, Quality Promotion and Training expert.**

1. Achievement in the authority that indicate a move from product to process certification? Why?
2. Perception on firm's initiative toward process certification (specially on EMS in general and ISO 14001 in particular).
3. Achievement beyond adopting of EMS ISO 14000 standards:
   -Is there any frame work to communicate and assist voluntary adopting these standards by users?
   -If yes the achievement?
   - If no reason why to adopt it?
4. As subordinary organization of MTI, is QSAE designated for the implementation of EMS on textile and leather industry? If yes,
   - what is the level of achievement?
   - Reason for success or fail
5. Perception (and achievement) toward '*Non Tariff Barrier*' that existed in developed world market.
   - technical standards (mandatory)
   - voluntary standards (respond to customer satisfaction)
   - who is responsible to hand the issue in Ethiopia (if not QSAE)?
   - attempts to facilitate international trade
     - Capacity building of laboratory (to be accredited), what are bases:
     - International market requirement (residual effects of chemical application in agricultural product)
     - Potential resource of the country (textile and leather)
6. Perception toward command-and-control Vs voluntary agreements, initiatives or standards in pollution prevention
7. Is there any strategy or mechanism established concerning pollution prevention and natural resource and environment management of industries (tannery).
8. What are QSAE's demand on leather industries?
   - how the authority communicate (frequency and quality information)?
   - how the industry urgently meet?
   - how QSAE perceive the availability of resource (financed and human) to meet/ compliant the required demand?

- Is there mitigation measure/ alternative presented to tanneries?

9. Perception toward influencing industries:
   - Positive incentive: subsides, tax advantage, capacity building, laxed control and etc
   - Negative incentives: withdrawal of license, tightened control and etc
11. Relationship with sectoral and cross sectoral institution and lower government bodies which are influential in day to day activity.
12. What are the main hindrances of moving from end to inside pipe in pollution prevention?
13. Is there any suggestion, proposition or anything else, that your think is not incorporated in the discussion?

IV. **Check list of issues for discussion with Deputy Manger of Environmental Service.**

1. Brief history of ECPC since establishment
2. Initial objective and aim and evolution of its approach
3. Perception toward end of pipe, cleaner production and inside the pipe approach
4. Perception toward enforceability of the current pollution proclamation of the country.
5. Current area of emphasis in intervention:
   - What are the rationales to select each activity
   - Relationship with stakeholders i.e. government (EPA, MIT, QSAE), firms or industries and NGO if any?
   - Selection of priority actions
   - How they influence the implementation of each objective and there achievement
   - Human and financial resource availability (in relation to multidisciplinary environment).
6. Perception toward environmental pollution created by industries in general and leather industry in particular.
7. Perception toward environmental performance variation between industries under intervention?
8. Factories attributed to the achievement in the intervention
   - Conducive environment existed: in stakeholder communication (advice and technical support)
   - International support (finance, technique and knowledge transfer)
   - Industries (under intervention) technical and human capacity.
   - Conducive environment existed in ECPC
9. Persistent of the achievement in the future (Specially CP)
10. Availability of skilled man power and institutions.
    - in system development and implementation
    - in system audit and certification
11. Getting appropriate and suitable functional bench marking criteria of sound environmental practice.
12. Main hindrance for the implementation your intervention activity
13. Is there any suggestion, proposition or anything else, that your think is not incorporated in the discussion?

V. **Check list of issues for discussion with ELIA, Representative.**

1. Brief history of ETA since it is established
2. Requirement of member ship (voluntary bases?) and what is there number of member
3. Initial aim/objective and current area of emphasis.
4. Achievement on bargaining power
   - difference between private Vs public and old Vs new
   - communication with EPA, MT I (QSAE, LLPTI and Investment Authority)
   - influencing supply chain i.e. hides and skins (preservation, quality, quantity and price) and chemicals (quality)
   - influencing the country's agreement in relation to market access and technology and knowledge transfer.

5 Perception toward leather industry vis-à-vis environment and development
- polluter payer principle
- end- of- pipe Vs inside the pipe approach
- voluntary standards
- MTI and EPA's strategy

6. Opportunities(potential but not utilized)
- resource endowment
- bilateral agreement

7. Constraint of financial and technical capacity of the association and participation of members
8. Hindrance on communication with governmental and non-governmental stakeholders.
9. Major hindrance for the better achievement and utilization of the opportunity at maximum level
10. The reason of identification of environment as threat.
11. Is there any suggestion, proposition or anything else, that your think is not incorporated in the discussion?

VI. Checklist of issue for interview with Leather and Leather Product Technology Institute, Head of Leather Technology Department

1. Brief history of the institute since its establishment
2. Initial objective and aim
3. Is then a change of objectives at present? If yes, why?
4. Leather sector expansion and livestock endowment as an opportunity.
5. Integration with value adding activities as government strategy i.e. exporting finished leather product
6. Opportunity of education policy (medium level technician training)
7. Good relation ship with line government offices, leather industries and NGO's
8. Constraints of scope to provide training on sound environmental practices (Actual) to processing industries (fleshing and tanners)
9. Availability of skilled manpower
10. Availability of financial resource
11. Technological transfer hindrances
- business issue(secret of some activities)
12. Is there any suggestion, proposition or anything else, that your think is not incorporated in the discussion?

Thank you

F. List of key Informant

1. Ato Kebede Amede, EMR of ETSC's EMS.
2. Ato Mohamed Ali, Head of Pollution Prevention Department in EPA.
3. Ato Geteye Asheber, Expert of Pollution Prevention Division in EPO.
4. Ato Yetebarek Fantahun, Head of Leather Desk in MTI.
5. Ato Debebe Yilma, Deputy Manager of Environmental Service in ECPC.
6. Ato Abdissa Adugna, Representative of ELIA.
7. Ato Genanaw Asefaw , Head of Leather Technology Department of LLPTI.

Annex A

Quaternaries, Interview Guide and List of Key Informants

A. Interview Questionnaire for Tannery Worker (Environmental Training

Introduction

Hello! My name is Gashaw Tesfaye and I am postgraduate student at the Addis Ababa University. I am a student of Institute of Development Research and am conducting a research on Implementation of EMS based on ISO 14001 in Ethiopian Tannery Share Company. I hope that the research outcomes contribute to the betterment of the tannery Environment Management System and further applications. Your kindly cooperation would help me for the successful completion of my thesis/research. So I would like you to answer a few questions. Your name will not be required and anything and everything that you say will be kept confidentially.

I General:

Respondent: Department: _____

Position/responsibility: _____

Date & time: _____

II Awareness and training

1. Are you aware that the tannery has an environmental management system? 1. Y 2.N

2. If yes, did you have an opportunity to offer your input? 1. Y 2.N

3. If yes, what was the input offered? (Max. of two responds in order of priority)
   1. _____
   2. _____

4. If no, what was the reason not offering? (Multiple responses are possible)
   1. Lack of awareness about his input is required
   2. Lack of mechanism that insist or motivate employee offers
   3. Lack of technical know haw about ISO 14001
   4. Lack of belongingness to the tannery EMS
   5. Others, specify _____

5. Are you familiar with the policy and objectives of the EMP? 1.Y 2. N

6. If yes, how did you become aware of the policies/program(s)? (Multiple responds are possible).

Means's of awareness creation	Duration
1. Posted on board 2. Referring on meeting 3. Training class or material 4. Other (specify)	Specify duration of exposure in time

7. Have you read/know the EMP? 1Y 2. N

8. Do you know where you can obtain a copy of the document(s)? 1.Y 2. N

9. If yes, where (indicate which document and where)? (Multiple responds are possible).

Type of document	Place where you get
1. The policy statement 2. The EMS manual 3. The EMP 4. Procedure 5. Monitoring report 6.Auditing report 7. Corrective action 8. Other (specify)	1. Posted on board 2. Documentation Room 3. Department head office 4. Planning section 5. EMR office 6. Archive 8. Other, specify

10. Do you believe that, in general, most employees are aware of the tannery's environmental programs? 1.Y 2.N

11. Do you know of any specific responsibilities in the document(s) that relate to your job? 1. Y 2. N

12. If yes, how did you become of aware of those responsibilities?
    1. Awareness creation program
    2. Training on EMS
    3. Stuff meeting in department
    4. Special training on duty/responsibility
    5. Others, specify_____

13. Have you received any environmental training from the tannery? 1.Y 2.N

14. If yes, who conducted the training and identify the most three important three knowledge you gain?

Trainer	Issues	Rank order
1. Consultant 2. Government delegates 3. Tannery EMR 4. Environment group member 5. Department Head 4. Others (specify)	1. Generally on EMS 2 Environmental aspects and Impacts identification 3.Environmental objectives and targets planning and how to achieve 4. Level of significant impact of the work you assigned 5. Procedure to prevent pollution 6.Consequences of departure from procedure 7. Other, specify	1. First 2. Second 3. Third

15. What important knowledge/skill did you acquire?
    1. Prevention of pollution occurrence
    2. Reduction of natural resources consumption
    3. Recovery of chemical
    4. Recycling of resource
    5. Avoidance of unwanted inputs or activities

16. Which of the above skills/knowledge do you think has an immediate benefit? (Max of three in ranking order)
    1. _____
    2. _____
    3. _____

17. Which of the above skills/knowledge (Q.15) related activity do you prefer most?
    1. _____

18. Where would you go/who would you go to if you needed information about any environmental responsibilities that you might have (indicate for which document)?

Type of document	**Where you go/go to**

19. If you were to receive awareness training about the Authority's environmental policies and programs, how would you like to receive it and the best three?

	Preferences	1.Y 2.N	Rank
1	Informally from your supervisor(s)		
2	Training seminars provided by your own department		
3	Through normally scheduled departmental meetings		1st
4	Training seminars from the staff of other departments		
5	Training seminars provided by external experts		2nd
6	Training seminars specific to your department/job		
7	Others, specify		3rd

20. Did you visit an area that demonstrates environmental stewardship such as ISO 14001 certified company? 1. Y 2. N

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Annex B

Environmental policy of ETSC [illegible]

In Partnership With

Pittards® WORLD CLASS LEATHER

ETHIOPIA TANNERY SHARE COMPANY

EMS POLICY

Ethiopia Tannery S.C is one of the modern and largest tanneries in AFRICA. The Company is moving towards achieving world class manufacturing standard. The Company is improving its managerial and technological capacity in order to reach the level of 100% finished leather production which is environmentally friendly for export and domestic market.

The Company is ISO 14001-2004 certified and always keep having a responsible attitude to the environment.

In maintaining and Improving the EMS the Company is Committed to:-

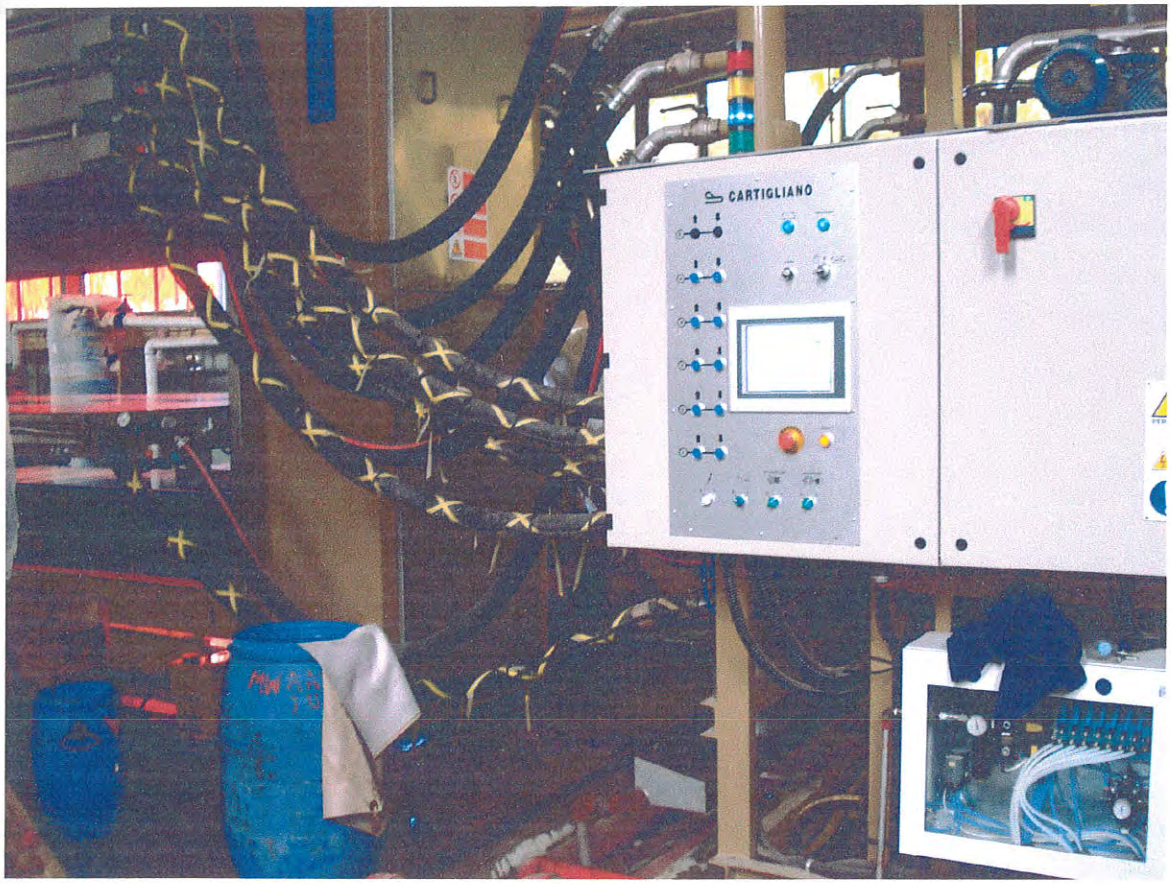
- Review all organizational activities for effective con trolling and preventing of pollution.
- Utilize the resources effectively.
- Train the employees regularly about its environmen tal policy, all environmental aspects, maintaining and improving of environmental performance in general.
- Continually improve all aspects of the company activities for better environmental performances through setting EMS objectives and targets and regularly monitoring them.
- Communicate and aware the stakeholders including the customers, suppliers, interested parties and the public at large.
- Maximize value added exportable products through complying with the national and international relevant legal and other requirements.

If you would like to know further details of the current environmental objectives, targets & any other issues of the Company's environmental activities, please don't hesitate to contact the Environmental Management Representative, Ato Kebede Amedie at the following address

Tel. 022-111-33 33 Fax: 022-111-45 82
E-mail keb@ethionet.et P.O.Box 5628, Addis Ababa
Ato Alem Asfaw
General Manager

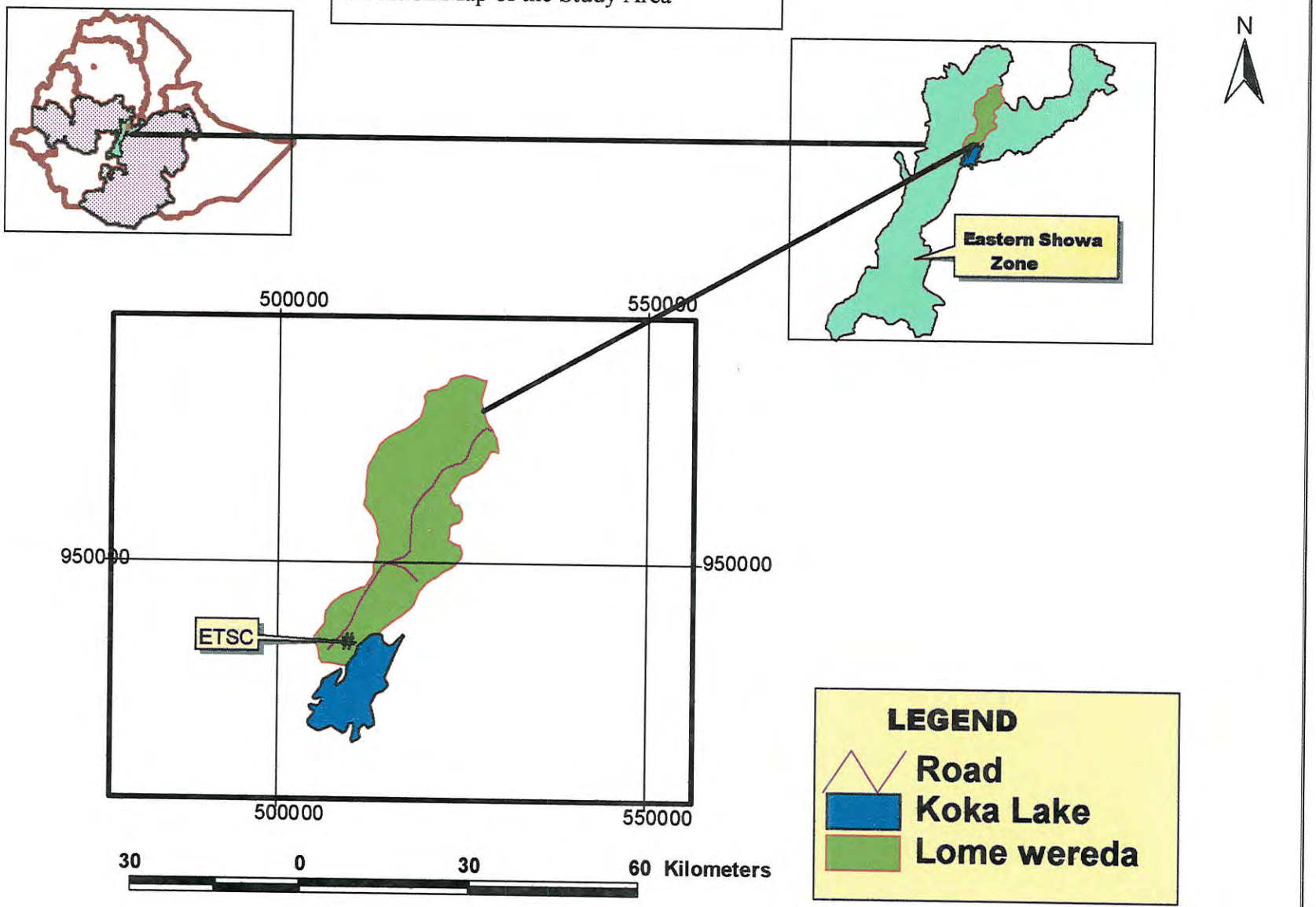
MONO 2000

Annex C
New Skin Drying Machine (BAT)



Annex D

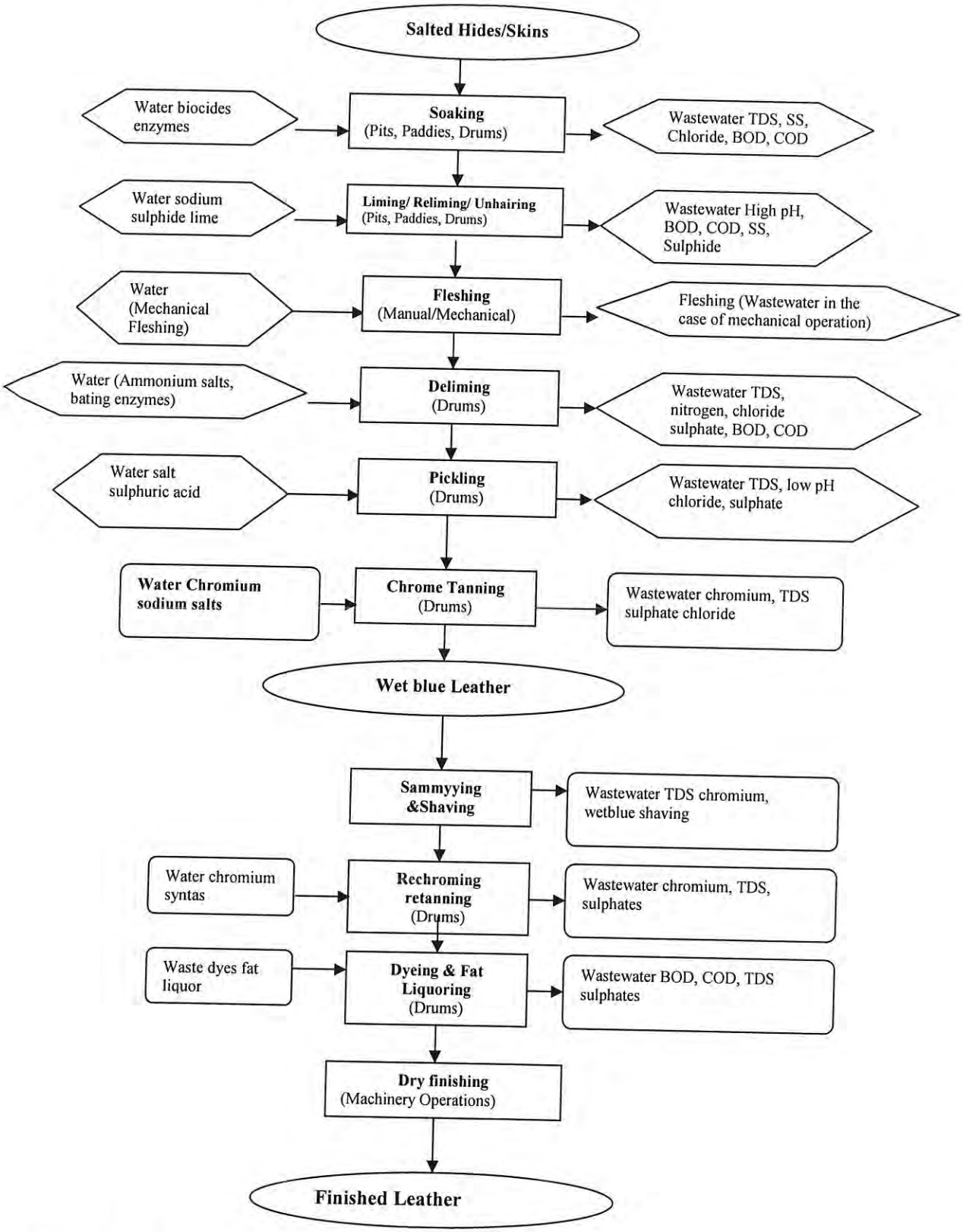
Location Map of the Study Area



Source: Social Science lab(A.A.U.), 2007

Annex E
Nursery Site

ANNEX C
Schematic Diagram of Tanning Process



Source: Joseph and Nagendram, 2004

Declaration

I, the undersigned, declare that the thesis is my original work, has not been presented for a degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

Declared by:

Gashaw Tesfaye

Candidate

Confirmed by:

Belay Simane

Advisor