ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
COLLEGE OF DEVELOPMENT STUDIES
INSTITUTE OF REGIONAL AND LOCAL DEVELOPMENT STUDIES

FACTORS AND ISSUES OF LOCAL MINOR INVENTION COMMERCIALIZATION IN ADDIS ABABA

BEKALU MOLLA

JULY, 2010
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A THESIS SUBMITTED TO INSTITUTE OF REGIONAL AND LOCAL DEVELOPMENT STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN REGIONAL AND LOCAL DEVELOPMENT STUDIES

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APPROVED BY BOARD OF EXAMINERS

Signature

1. Dr. Woldeab Teshome
   Chairperson
2. Workneh Negatu (PhD)
   Advisor
3. Issac Paul (PhD)
   Examiner

Acknowledgment

First and foremost, I would like to express my extreme gratitude and indebtedness to my thesis advisor Workneh Negatu (PHD) who spent much of his invaluable time in providing me with the extraordinary guidance and supervision at all levels of the study. Therefore, the largest part of the credit for the successful completion of this study goes to him.

My sincere thanks go to staff members of EIPO and MoST for their co-operation and provision of relevant information for the work. Besides, staff members in the library of MoST for allowing me to access their library and providing relevant materials for the study. Minor inventors in the study area who provided all the information necessary for the research without reservation also need great thanks.

I am especially grateful to my wife, w/ro Firehiwot Endale, who provides me more support required to undertake this research in particular and to pursue the programmes to the study in general. Without her patience all these years, encouragements and love this would not have been possible.

Last and not the least, my heart felt thanks goes to my friends who have assisted me in various ways during the study for their logistical, materials and moral supports. Thank you all.

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intellectual property policy, but the various policies issued by the government clearly recognize the importance and need for promotion of intellectual property, the promotion of local creative, inventive and innovative activities as well as facilitating the acquisition and exploitation of foreign technology.

To this end, the government of Ethiopia has designed and implemented interventions which focus on Science, Technology and Innovation since 1975. Among the most notable government polices, the National Science and Technology Policy issued in 1993 can be mentioned. It was designed in response to the realization of the country's weak science and technology capacity, and recognition of the role of science and technology for development. The major objectives of the policy include building capability to generate, select, import, develop, disseminate and apply appropriate technologies; and improving the knowledge, culture and the scientific and technological awareness of the peoples of Ethiopia.

In addition, EIPO which is accountable to MoST established under proclamation no. 320/2003 with the objectives to facilitate the provision of adequate legal protection for exploitation of intellectual property in the country; and to collect, organize and disseminate technological information contained in patent documents and encourage its utilization. Area of protection includes patent of introduction, utility model certification and industrial design registration certificate granted to invention, minor invention and industrial designs respectively in accordance with the Proclamation Concerning Inventions, Minor Invention, and Industrial Designs, Proclamation No.123/1995. This proclamation is designed for creating conducive environment to encourage local inventive activities to build up national technological capability. This objective is talking about Ethiopinization as the word "local" envisages. It means that the legislature is giving certain chances to Ethiopian nationals to honor their inventions compromising the excessive demand of relying on foreign inventions.

Notwithstanding positive development in the legal and policy environment, however, there are a multitude of problems associated with intellectual property creation, development and exploitation. For instance, Mulugeta (2004) observed that factors such as lack of intellectual property protection; financial constrains on R&D expenditure and venture capital; cultural

barriers; poor technology policy and regulation; demand side constrains; and human capital constraints are the major barriers in Ethiopian innovation system. Also, IKED (2006) identified additional problems like weak collaboration between firms, and universities; and low information and communication technology. All of these focus on the issues of why creation of new ideas or products or methods is low in Ethiopia. With these limitations more than two hundred individuals/firms granted utility model certificate for their minor invention by EIPO. Utility model certificate is issued to protect a minor invention or incremental invention which is fit for practical use.

Moreover, several studies made such as Moti Jaleta et al., 2009 ; Samueal and Sharp, 2007; Sharp et al., 2007; Leavy and Poulton, 2007; Davis et al., 2006; Samueal and Ludi, 2007; Birhanu Gebremedhin et al., 2006 focus on agricultural innovation and agricultural commercialization. Besides, previous researches on the subject focus on barriers to innovation. However, all these did not highlight invention commercialization particularly to those who are granted utility model title (minor invention) by EIPO.

There are many minor inventions which could potentially proceed to the market. EIPO has already granted protection. Suffice to mention, stem ironing machine, economical kerosene stove, plough, portable shower, modern tea leaf harvesting apparatus, modern bee hive, smokeless plastic recycling machine and various simple agricultural machines among others. However, in Ethiopia the granted minor inventions commercialization remained insignificant. For instance, Patent Search and Examination Expert at the office said to , 'iconcept magazine' reporter, in 11 years the office granted more than 200 utility model certification for minor invention even if a few percentages of these are commercialized (Aynew,2009).

Thus, as there no studies that directly examined factors and issues of local minor invention commercialization in Addis Ababa a detailed assessment on the area is worth researching to bridge the knowledge gap.

1.3 Objectives of the study

1.3.1 General Objective: The general objective of the study is to investigate factors and issues of local minor invention commercialization in Addis Ababa.

1.3.2 Specific Objectives: The specific objectives of the study include:

- To assess the extent of local minor invention commercialization.
- To assess the state of option(s) to commercialize local minor invention.
- To assess the contribution of relevant institutions in commercialization of local minor invention.
- To identify challenges of local minor invention commercialization.

1.4 Significance of the Study

The long-run performance of an economy depends upon its success in innovation of new product and process. Therefore, knowledge on factors and issues of local minor invention could provide insights about the nature of variable that could be induced for the adoption of intervention that increase the likelihood of commercializing local invention and improve socio – economic benefits. Since, no similar study has been conducted in the study area in particular and in Ethiopia in general, this inquiry, therefore, will serve as a springboard for future studies. It can also give an input for the administrators, ministries and stakeholders/actors who in one or another way are engaged in the development of local invention for economic development.

1.5 Scope of the Study

Successful invention is a wide concept which consists of multiple interactions. It is a result of national innovation system. EIPO grant intellectual property right for utility model, industrial design, patent and patent of introduction. But the scope of this study is delimited to those who are granted certificate for their minor invention (utility model)at least three years ago and considering only the case of metal and engineering sector. In addition, the study delimited to post granting efforts made by them to commercialize the product.

1.6 Limitation of the Study

Research works are constrained by various factors in one way or another; hence, none is free of limitations. Although efforts were made to make the study successful and produce a reasonably reliable research output, this study constrained by the following limitations.

Successful local invention commercialization is the result of the interaction of multitude of variables. Despite this fact, the study has analyzed some few variables assumed to meet the objectives. Therefore, it is the researcher's view that, the study could have been too inclusive if all pertinent factors were integrated.

In addition, the challenge of the study is unavailability of exact numbers of minor invention and classification by sectors and regions at EIPO. However, for this study purpose with the help of experts at the office classification was made.

Since the approach of the study was that respondents were interviewed at their business and/or location, it was not easy to locate and in some case their telephone address was not functional. Some also think that the academicians just use them as ladders to acquire qualification without assisting them and some cases respondents declined to be interviewed and fail to respond exactly certain questions owing to memory loss.

1.7 Organization of the thesis

The thesis is organized into five chapters. The first chapter is introduction. Chapter two is review of related literature and conceptual framework. The third chapter is about methodologies and description of the study area. The fourth chapter deals pertaining the result and discussion of the empirical finding part of the study. Finally, the fifth chapter deals the summary, conclusion and recommendations of the study. This chapter recapitulates and concludes the foremost findings and forwarded possible policy recommendation that would help to strengthen local invention commercialization in the study area.

Chapter Two

Review of Related Literature and Conceptual Framework

2.1 Invention and Innovation: Basic Concepts

Before existing theories are reviewed, however, it is important to clarify points of departure and simple definitions. There is little consensus about the precise concept of invention and innovation though economist, politician and business leaders frequently use them differently (Anandajayasekeram and Berhanu, 2009; Oyelaran-Oyeyinka, 2006). Invention may be assumed to mean anything human made different from anything already existing (Kaiserfeld, 2005). Strictly speaking, every invention is an idea, or constellation of ideas; but some inventions by their nature must remain mental organization only, whereas others may be given overt and tangible expression (Ibid).

A more important distinction of invention is achieved by contrasting it to the concept of innovation. Schumpeter made the first valuable distinction between invention and innovation. He defined invention as an idea, sketch or a model for new or improved device, product, process or system and an innovation as the introduction of new method of products, new product , the opening up on new market...(Dereje, 1988; Oyelaran-Oyeyinka, 2006). By the same token, Levitt (2002) pointed out invention and innovations are not synonyms. He termed invention as 'Ideation' that deals with the generation of ideas and innovation as the implementation of idea. Similarly, Elster (quoted in Kaiserfeld, 2005) defined innovations as the production of new technical knowledge while invention is said to be the generation of some scientific idea, theory or concept that may lead to an innovation when applied to a process of production. Oyelaran-Oyeyinka (2006), while outlining the difference, he argued that innovation is neither research nor science and technology but rather the application of knowledge in production. This knowledge might be acquired through learning, research, or experience, but until it is applied in the production of goods and service it cannot be considered innovation.

According to Ernst et al. (cited in Oyelaran-Oyeyinka, 2006) in contrast to invention, which refers mainly to novelty and is a key criterion for patenting, innovation is a much broader concept. According to them innovation refers to the process by which firms master and

implement the design and production of goods and service new to them- irrespective of whether these products and service are new to their competitors, their countries and the world. Moreover, Barnett (quoted in Kaiserfeld, 2005) defined innovation as any thought, behavior or thing that is new because it is qualitatively different from existing forms. However, Rothwell (cited in Anandajayasekeram and Berhanu, 2009) reminded that innovation is not always about radical change 'innovation does not necessarily imply the commercialization of only a major advance in the technological state-of-the art ... but it includes also the utilization of even, small scale changes in technological know-how'.

It has correctly been pointed out that invention may be abundant in a specific culture without ever being developed into innovation. One often cited example is ancient China where a lot of techniques such as paper, gunpowder, printing etc were invented but never implemented on a broader scale. It is possible to have inventions in large quantity and still lack of innovations. Hence, invention usually is assumed to precede innovation which in its turn is assumed to precede implementation, i.e. the process that take place when a product or a process is adjusted and further developed to fit market conditions (Kaiserfeld, 2005).

Similarly, Moussa (2003) remarked as an idea is not an invention and therefore cannot be commercialized even at local level. To be commercialized or make use of it, an idea must be more than a concept. It must be the basis of either a tangible product or a process. To others, the term innovation means the first commercialization of new or qualitatively changed product or process (Dereje, 1988). However, a successful developed new technology does not necessarily succeed in the marketplace (Mansfield quoted in Melekers et al., 1993). Innovation is a very complex process and it is influenced and conditioned by a variety of factors and elements, such as the education system, the working environment, the economic environment, the financial system, the social and cultural environment, etc(WIPO, 1999).

In a nutshell, science, technology, and innovation include all forms of useful knowledge (codified and tacit) derived from diverse branches of learning and practice, ranging from basic scientific research to engineering to traditional knowledge. It also includes the policies used to promote

scientific advance, technology development, and the commercialization of products (UN Millennium Project, 2005)

2.2. Invention and Innovation: Classification

Theories of invention may be classified according to how they explain the emergence of invention. The most common categories are those technical inventions that occur in the context of problem solving, individual creativity that can be spurred by organizational and social conditions and access to resource is focused. There are no inventions without individual efforts and social environment as well as without resource and problem to be solved (Vandervert cited in Kaiserfeld, 2005).

In the literature, it is common to introduce distinctions between different types of inventions and innovations such as radical versus conservative (incremental) or independent versus routine regarding perceived extent of change (World Bank, 2005; Kaiserfeld, 2005; Oyelaran-Oyeyinka, 2006). According to Oyelaran-Oyeyinka (2006), there are many definitions of innovation depending either on disciplinary focus (for instance, sociological or managerial economics) or perspective (for instance, user, producers or seller). He further listed several characteristics of innovation, prominent among which are uncertainty, interactive and learning and a degree of innovation, which leads to characteristics such as 'major-minor' and 'radical- incremental'. Major innovation change refers to a radically new technology which may be developed on the basis of pure research to satisfy techno-economic or market needs in developed countries. While minor innovation which arises to modify or improve of existing technology is more narrowly focused on applied research and development as well as trial and error experimentation (Kahen and Sayers, 1995).

Generally, radical inventions are supposed to be created through changes on supply side and incremental as reaction on the demand side. Furthermore, major innovation along-with minor innovation are mostly carried on concurrently within the techno-economic systems of developed countries; so, major as well as minor innovations occur at both macro and micro levels of these systems. But due to various shortages and inadequate conditions within the techno-economic systems of developing countries, major innovation cannot be addressed at the macro level, and

simply cannot take place. Consequently, most innovation activity in developing countries is minor and limited type and even this depends upon foreign imported technology (Kahen and Sayers, 1995). In addition, innovation in developing context includes continuous improvements in product design and quality (Lundvall quoted in Oyelaran-Oyeyinka, 2006)

In a global perspective, World Bank (2005) distinguished three forms of innovation. The first one relates to local improvements based on the adoption of technologies which are more or less available worldwide or locally ('technological adoption' from a global perspective). The second type of innovation materializes in the building up of competitive activities with some adaptation made to existing technologies ('technological adaptation'). The third type of innovation is the design and production of technologies of a worldwide significance ('technological creation' from a global perspective).

2.3. National Innovations System (NIS)

2.3.1 Concepts and Features of NIS

After its introduction in the late 1980s, the concept of national innovation systems has been further elaborated and theoretically underpinned in the early 1990s. It meanwhile can be regarded as an established approach within modern innovation research and it has shown to constitute an adequate conceptual framework for the empirical study of innovation processes on the country level. Above all, the approach focuses on the analysis of nationwide structures of innovative activities, their institutional determinants and economic effects (Balzat and Pyka, 2005).

Different authors may mean different things when referring to a national system of innovation. Some major differences have to do with the focus of the analysis and some with how broad the definition is in relation to institutions and markets (Lundvall, 2007).A system of innovation is defined as a network of economic agents, together with the institutions and policies that influence their innovative behavior and performance (Nelson; 1993, Nelson and Winter; 1993, Lundvall; 1992 cited in Mytelka and Oyelaran-Oyeyinka, 2003). World Bank (2008) cited in Anandajayasekeram and Berhanu(2009) defined NIS as a set of functional institutions, organizations and policies that interact constructively in pursuit of a common set of social and economic goals and objectives, and that uses the introduction of innovation as the key promoter of change.

Perhaps the most comprehensive definition among scholars is Metcalfe's definition which can be stated as follows:

> *"that set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the innovation process. As such it is a system of interconnected institutions to create, store and transfer the knowledge, skills and artifacts which define new technologies"* (Metcalfe,1995 in UNCTAD ,2006)

According to UNCTD (2007) the ability and propensity of an enterprise to innovate not only depends on its access to knowledge from research institutes or technology service centers(pushed or pulled), but also on many other factors including: access to finance; access to human resource; adequate basic physical infrastructure; firm-level capabilities; inter-firm linkage and collaboration; general business service; demand conditions; and the framework conditions including the investment climate, general cultural propensity toward entrepreneurship and levels of literacy. There is no longer a single source of innovation (science research) but multiple sources, including interactions among enterprise and sectors. The main elements of such system are illustrated schematically in Figure 2.1.

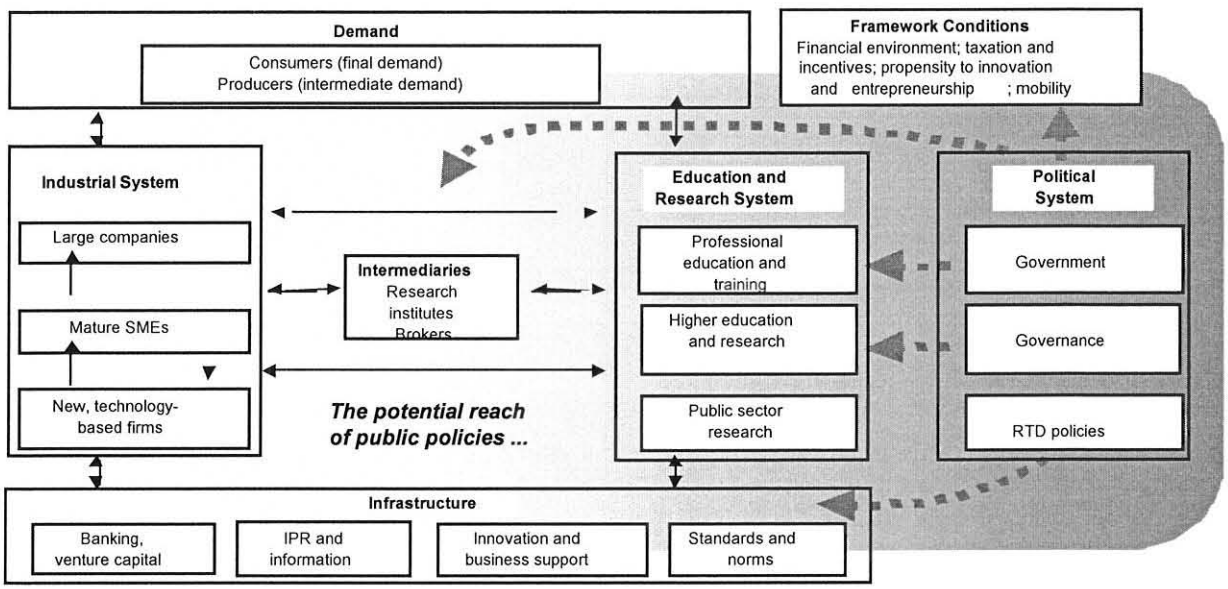
By the same token, the process of technological innovation involves interactions among a wide range of actors in society, who form a system of mutually reinforcing learning activities. These interactions and the associated components constitute dynamic innovation systems'. Innovation systems can be understood by determining what in the institutional mixture is local and what is external. Open systems are needed, in which new actors and institutions are constantly being created, changed, and adapted to suit the dynamics of scientific and technological creation. The notion of a system offers a good framework for conveying the notion of parts, their interconnectedness, and their interaction and changes over time (UN Millennium Project, 2005).

In addition, the same report stated that government, the private sector, universities, and research institutions are important parts of a larger system of knowledge and interactions that allow diverse actors with varied strengths to come together to pursue broad common goals for

innovation. In many developing countries, the state has much greater capabilities than the private sector, capabilities built up as a result of import substitution policies adopted when the public sector played the dominant role in the country's economy. Private sector capacity for adapting tacit knowledge and mature technology, and absorbing new knowledge, varies by country, region, and sector (Ibid). Underlying the system of innovation approach is an understanding of innovation as an interactive process in which enterprises in interaction with each other and supported by institutions and a wide range of organization play a key role in bringing new products, new processes and new forms of organization into economic use (Mytelka and Oyelaran-Oyeyinka, 2003).

The recent explosion of analytical work and studies using the NSI-concept makes it difficult to establish a classification. Many of the empirical contributions referring to the NSI-concept are highly descriptive and they map public infrastructure and public policies aiming at stimulating science and technology. In these studies both the core system of firms in interaction and the evolution of the human resource base are neglected. If they take a historical perspective it is a history of formal organizations and policies (Lundvall, 2007)

Figure 2.1. A generic national innovation system



Source: (*Arnold, E., Kuhlman, S, 2001, Available at www.technopolis-group.com*)

2.3.2 NIS and Innovation Policy in Developing Economies

Science, technology, and innovation policy cannot be viable unless it is underpinned by well-designed measures for addressing such issues as learning, research and development (R&D), and the diffusion, transfer, and commercialization of technology (Cantner and Pyka 2001 cited in UN Millennium Project,2005). NIS policies and programs that seek to enhance a country's innovative and technological capacity, already quite popular in developed economies, and have more recently come under sustained examination in the context of developing countries (Feinson). However, most Sub-Saharan African countries do not have explicit national innovation policy frameworks. Many of the countries use implicit innovation policy measures which are often outlined in trade and industrial policies. They do not have coherent policy regimes or instruments that are specifically dedicated to the promotion of technological innovation (Mugabe, 2009). As many development scholars have argued, successful economic and industrial development is intimately linked to a nation's capacity to acquire, absorb and disseminate modern technologies. Whereas in developed economies the innovation system serves the role of maintaining or improving an already established level of competitiveness and growth, developing countries are faced with the task of "catching-up" (IKED, 2004).

Charles Edquist in Feinson has presented a concept called Systems of Innovation for Development (SID), which stresses some key differences with the NIS approach taken in developed economies. He argues that there are four main areas where SID diverges from NIS:

- Product innovations are more important than process innovations because of effect on the product structure;
- Incremental innovations are more important and attainable than radical ones;
- Absorptions (diffusions) are more important than development of innovations that are new to the world;
- Innovations in low and medium technology sectors are more attainable than those in high technology systems.

Strengthening incentives to innovate depends on a broad range of economic, social and political factors, including the knowledge ecology, or the set of institutions that enable access to, and production and use of knowledge for learning and innovation (Dasgupta, 2007 cited in Feinson).

The existence of property rights and the rule of law are certainly amongst the inducement incentives, but they do not act alone. A degree of political stability as well as clear-sighted leadership will also have a role in encouraging a climate where citizens are willing to invest in change, as well in basic social factors such as health and safety standards and life expectancy. However, a range of government policies with respect to taxation, competition, human capital and the investment climate will be important in establishing the incentives to encourage the development of absorptive capacity at both firm and national levels. At the same time, the banking and financial system will have a pivotal role in releasing resources for capability building (Rogers, 2004 cited in UNCTD, 2007)

These factors should be guided with appropriate policy to encourage and support innovation. However, it is difficult to construct a systematic picture of polices to promote science, technology and innovation in the LDCs. However, many LDC governments prepare poverty reduction strategy paper and these documents give a good indication of the priority which is given to science and technology issues in national policy. In addition, some might argue that science, technology and innovation policies are a luxury which LDCs cannot afford at their stage of development (UNCTD, 2007).

There are two broad strands of the literature that provide theoretical support for technology and innovation policies, namely the market-failure rationale and the systems-failure approach deriving from evolutionary economics theory (Arrow 1962; Nelson 1959 cited in Oyelaran-Oyeyinka, 2006). According to the former, the key source of technological advance, which is research and development (R&D), suffers from the twin failures of uncertainty and low appropriability. Firms will under invest in knowledge generation because social rates of return from R&D supersede private returns. Therefore, a firm will place a low premium on a potentially socially useful innovation that, from the judgement of the firm, might be costly, risky, and promise low future returns. The outcome is underinvestment in socially useful innovation.

A system failure occurs when market and non-market organizations interact in suboptimal ways or do not interact at all. According to Mytelka and Oyelaran-Oyeyinka (2003) in developing countries, the systemic failure found in the innovation system is, in part, a result of the

fundamental weakness of political-policy institutions and processes. The instruments employed to rectify systemic failure will equally have both market and non-market elements. The former include patents, tax incentives, and subsidies; whereas, the latter includes all actions to promote the generation, validation, and sharing of knowledge within a collaborative learning environment.There are institutional inadequacies that manifest themselves as lack of rules of the game, poor enforcement of contractual laws, and inadequate intellectual property laws, which may constitute disincentives to innovation and technological learning. These lead to inefficiencies in the functioning of innovation systems.

The uncertainty and less appropriability arguments therefore point to a set of policy actions that have to guide decisions about the role of government in designing and maintaining effective innovation policy. Beside, the existence of systemic failure provides an economic justification for policy to intervene to correct for system failure (see box 2.1)

Box 2.1: Innovation Policy Instruments

Supply Side: (1) Support for knowledge infrastructure particularly R&D in public and private domains, promote research and professional associations, use of competitive research grants; (2) general and technical education, support university research, apprenticeship programs; and (3) Information networks, library and database services.

Macroeconomic Conditions: (1) Loans, subsidies to private provision of innovation, financial services, export credits; (2) taxation: company, personal, indirect and payroll taxation and tax allowances; (3) Legal regulatory: patents, health and environmental regulations and monopoly regulations and competition policy.

Demand Conditions: (1) Procurement policy**:** central and municipal government purchases and contracts, R&D contracts, purchases; and (2) Commercial instruments: trade agreements, tariffs, currency regulation.

Source: Oyelaran-Oyeyinka, 2006

2.3.3 Activities and Functions within a National Innovation System

A fundamental problem confronting analysts of national innovation systems is the danger of expanding the concept to the point where it includes virtually all aspects of a country's social,

economic, political, and cultural activities. As some have pointed out, since "the whole socio-economic system can, of course, not be considered to be included in the SI (system of innovation)... The question is then which parts should be included?" Edquist, 2002). One way of approximating an answer to this question is to identify the "functional boundaries" of an NIS, beyond the "overall function of producing, diffusing and using innovations".

According to Johnson and Jacobson (2000) cited in Feinson outline five primary functions:

- Create 'new' knowledge;
- Guide the direction of the search process;
- Supply resources, i.e. capital and competence;
- Facilitate the creation of positive external economies (in the form of an exchange of information, knowledge, and visions); and
- Facilitate the formation of markets.

2.4. Intellectual Property Rights

2.4.1 Intellectual Property Rights: Concepts and Definitions

With the increasing importance of knowledge as a driving force of innovation and economic growth worldwide, intellectual property rights are becoming central to the modern economy. This is particularly true in the context of current global challenges which include economic recession, the challenges of climate change, and public policy issues such as health and food security. In all these cases, human creativity and inventiveness will be essential to finding solutions for a sustainable future, and IP rights are an important tool for stimulating and rewarding that creativity (WIPO, 2009)

The term "intellectual property rights" (IPRs) refers to those legal rules, norms and regulations that prevent the unauthorized use of intellectual products. IPRs cover a broad range of subjects, patents, copyrights, trademarks, geographical indications, industrial designs and trade secrets. Intellectual Property (IP) essentially consists of two domains: one deal with industrial products (which include patents, trademarks, industrial designs and geographical indications of source) and the other with artistic products (which are covered by copyright and related rights). Once

IPRs are established, their owner enjoys certain specified rights in terms of its duration i.e. 20 years for patents and life of the author plus not less than 50 years after his death for copyrights [WIPO, Publication No. 909(E)].

In addition, intellectual property systems are more than just pieces of legislation, and may best be viewed as public policy regulatory institutions. As such, they consist of the relevant statutes, rules and regulations plus the government agencies, courts and professional people involved in interpretation, implementation, enforcement and reform. Institutions are not static but evolve over time, and they operate in different ways according to the context (UNCTAD, 2007)

However, the "market failure" argument should not be carried to logical absurdities and countries should not accept that it is necessary to allocate property rights on *every* intellectual output of the creator. Not everything created under the sun must be awarded intellectual property protection. Limits have to be placed on the exact breadth of patent protection of innovations, and countries should take note as to the effects of widening the current patent regime. In some instances, intellectual property rights can reach untenable levels whereby the intellectual property owner becomes a monopolist of discoveries or ideas, as opposed to "inventions". (UNCTAD-ICTSD Project on IPRs and Sustainable Development, 2006)

2.4.2 Utility Model and Patent

There is no global acceptance of the term "utility model" due to there being fundamentally different concepts from one country to another. If one examines national laws, one finds that utility model protection is referred to in Australia as "innovation patent", in Malaysia as "utility innovation", in France as "utility certificate", and in Belgium as "short-term patent" (UNCTAD-ICTSD Project on IPRs and Sustainable Development, 2006)

Utility models are a form of patent-like protection for minor or incremental innovations. They tend to protect the functional aspect of a product (UNCTAD, 2007). Utility models have been implemented in a number of developed and developing countries. According to WIPO [Publication No. 450(E)] a patent is an exclusive right granted for an invention, which is a product or a process that provides a new way of doing something, or offers a new technical

solution to a problem. A patent provides protection for the invention to the owner of the patent. The protection is granted for a limited period generally 20 years. Patent protection means that the invention cannot be commercially made, used, distributed or sold without the patent owner's consent [WIPO Publication No. 450(E)]. Feldman and Stewart (2007) revealed that while patenting measures invention, commercialization requires the additional steps of translating inventions into consumer needs and product markets. Box 2.2 summarizes the difference between utility models and patents.

The patent system was basically conceived as an important tool to stimulate indigenous technological development, promote domestic inventive activity and enhance the exploitation of patented invention. Patents also provide incentives to individuals by offering them recognition for their creativity and material reward for their marketable inventions. These incentives encourage innovation, which assures that the quality of human life is continuously enhanced and inspiration for future generations of researchers and inventors [Getachew, 2009; WIPO, Publication No. 450(E)].

One of the rights of a patent owner is the right to decide who may –or may not- use the patented invention for the period in which the invention is protected. The patent owner may give permission to, or license, other parties to use the invention on mutually agreed terms. The owner may also sell the right to the invention to someone else, who will then become the new owner of the patent. Once the patent expires, the protection ends, and an invention enters the public domain, that is, the owner no longer holds exclusive right to the invention, which becomes available to commercial exploitation by others [WIPO, Publication No. 450(E)].

Box 2.2: Summary of the difference between utility models and patents.

- The requirements for acquiring a utility model are less stringent than for patents. While the requirement of "novelty" has always to be met that of "inventive step" or non-obviousness" may be much lower or absent altogether. In practice, protection for utility models is often sought for innovations of a rather incremental character which may not meet the patentability criteria.
- The term of protection for utility models is shorter than for patents and varies from country to country (usually between 7 and 10 years without the possibility of extension or renewal).
- In most countries where utility model protection is available, patent offices do not examine applications as to substance prior to registration. This means that the registration process is often significantly simpler and faster, taking, on average, six months.
- Utility models are much cheaper to obtain and to maintain.
- In some countries, utility model protection can be obtained only for certain fields of technology, and for products but not processes.

Source: WIPO at www.wipo.org/sme/en/ip_business/utility_models/

2.4.3 Theoretical and Policy-related Justifications for Utility Models

Ideas are among the most complex creation of human endeavor. Because producing new ideas involves the commitment of time and money (often in the form of specialized assets) with an uncertain outcome, it tends to be a high-fixed-cost activity vulnerable to copying by competitors. However, unlike in the case of a public good, it is possible for the creator of an idea to exclude others from using it, although this may damage social welfare by stopping the flow of ideas from reaching those who could use it most effectively. By implication, managing this knowledge trade-off needs non market (social) mechanisms, of which intellectual property rights (IRP) are seen as the most compatible with the working of market forces (WIPO,2009)

Such rights can be converted into market monopolies if the invention so protected results in a commercial product and depending on certain factors such as the relationship between the invention and the product, which may actually be protected by more than one patent. The public goods explanation for patents suggests that the possibility of acquiring such rights encourages both investment in invention and the research and development needed to turn inventions into marketable innovations. Information about the invention as revealed in the patent and by the

invention itself is diffused throughout the economy. In this context, it is helpful to conceive of a patent as a contract between the holder and the government on behalf of the citizenry. The holder receives an exclusive right over his or her invention in exchange for the payment of fees and – which is much more important – for disclosing the invention for others to learn. Without a patent, the inventor would have no incentive to disclose it. This would be a loss for the society if such lack of protection left the inventor with no alternative but to keep it secret. Such an alternative is a feasible option in several technological fields including biotechnology. But it is also true that many kinds of product would upon examination readily betray the invention that brought it into (ESTC, 2002)

Most of the developing countries have no utility model protection. As a result, a large number of useful technologies are excluded from protection mainly due to the stringent requirements of patentability i.e. novelty, inventive step and industrial applicability (Getachew, 2009). In countries where little inventive activity takes place, free access to technical information may well do more to foster technological capacity building than providing strong private rights over such information. In fact, technological capacity building may at certain stages of national development be best achieved by requiring foreign technology holders to transfer their technologies on generous terms rather than by trying to encourage domestic innovation by making strong legal rights available to all. This suggests that developing countries should be careful not to make the rights too strong until their economies are more advanced. Historical evidence indicates that several present-day developed countries, rightly or wrongly, took such a policy decision in the past (UNCTAD-ICTSD Project on IPRs and Sustainable Development, 2006).

Utility models can thus be justified on both theoretical and practical grounds and these are closely related. The theoretical rationale for utility models derives from the facts that most social welfare-enhancing inventions are cumulative in nature and that a great deal of them are sub patentable in the sense that the novelty and inventive step requirements are too high for the patent system to accommodate them. Moreover, many inventions which originate in SMEs have a lower standard of inventiveness, and are prime candidates for free riding activities by competitors. Consequently, utility models may be highly pro-innovation and consequently good for the national economy (ESTC, 2003).

UNCTAD (2007) and ESTC (2003) stated the reason why utility models may be good for SMEs is that the cost factor may inhibit them from using the patent system as much as they would desire since utility models are much cheaper to obtain and to maintain than patent. According to UNCTAD and ICTSD Project (2006) utility models may serve as a useful tool for promoting the type of innovation generated in developing countries. These include: (i) enabling artisans to secure protection for types of innovation that do not meet the stricter novelty and inventive step requirements of patent law; (ii) making it possible to increase the role of traditional innovators and artisans in economic development; (iii) acting as a catalyst to enhanced levels of innovation; (iv) the fact that they are cheaper to acquire than patents; and (v) that they may become a source of data on innovative activity and experience in technological management.

2.5 Commercialization

Writing on commercialization highlights a number of aspects to what it means to be commercialized. Commercialization refers to the series of activities undertaken by a firm to transform knowledge and technology into new product in response to marketing opportunities. Some view it to mean turning an idea or invention into marketable products that will return a profit (Rosa and Rose, 2007). Zahra and Nielsen (2002) viewed [...] commercialization as the process of acquiring ideas augmenting them with complementary knowledge, developing and manufacturing saleable goods, and selling the goods in a market. Similarly, U.S. Congress, Office of Technology Assessment, (2005) stated that commercialization is an attempt to profit from innovation by incorporating new technologies into products, processes, and services and selling them in the marketplace. For many new technologies, commercialization implies scaling up from prototype to volume manufacturing and committing greater resources to marketing and sales activities

Feldman and Stewart (2007) also stated that commercialization is the process that turns an invention into an innovation and involves defining a concept around who is willing to pay for the new idea, what attributes they value and how much they are willing to pay for the added value. The ability to legally protect an invention therefore forms the basis for commercialization activities, as it precludes others from copying the invention and entering in the market and competing for a share of the economic profit. More importantly, if firms did not have the ability

to protect their discoveries, they would have no incentive to invest in many important research and development (R&D) activities. As such, IP creation is a fundamental ingredient of the commercialization process and an important vehicle for knowledge transfer between legal entities and the public (Feldman and Stewart, 2007)

It begins by identifying potential market then starts with invention and/or analytical design for a new process or product that is to fill the market need. Next, the actual development of the innovation (design and testing) and redesign and eventually enters full-scale production follows. Lastly, the innovations are brought onto the market, initiating marketing and distribution efforts (Palmberg, 2006; Zahra and Nielsen, 2002). Commercialization is an important linkage measure as it is the creation of market value from knowledge. It can result from the sale of intellectual property, or it's licensing to the private sector, or the spinning off a new firm to bring the new knowledge to market, or a combination of these (Gault, 2008).

Decisions to commercialize new technology are made by individual firms, but are closely linked to characteristics of the innovation system in which the firm operates. Manufacturers must assess the likelihood of securing funding from internal and external sources, their ability to develop or gain access to manufacturing equipment and supplies, and the size of potential markets. Without the proper infrastructure to support their efforts, firms cannot be assured of winning returns from their investment, and competitors with a better support infrastructure may be able to capture the market. Pioneers in a new market often lose out to imitators with better financing, infrastructure, and strategy (U.S. Congress, Office of Technology Assessment, 2005)

The Canadian Expert Panel (quoted in Rosa and Rose2007) identified elements on commercialization. These are: financial; skills and human resources; the global perspective; intellectual property; regulatory environment and partnering. Further the panel stated that commercialization affects outcomes for example, economic growth, productivity, market success to mention a few. The transformation of an innovation success to a market success is determined at the level of the firm. Palmberg (2006) identified success, at firm level, is usually measured in terms of rising market share, productivity growth or profitability. Further, he stated successful innovation ranging from the technical novelty, commercial success, or commercialization and break-even of innovation. This performance is the result of firm capability, human resource,

incentive structure, human capital of top management team, and the environment in which firms operate (Nerkar and Shane, 2007)

2.5.1 Models of Commercialization

2.5.1.1 Chronological and linear approach

2.5.1.1.1 Model of H. Randall Goldsmith

Most commercialization models begin by taking an idea through some sort of stage-gate product development process (Prebble et al., 2008). Randall Goldsmith's commercialization model is a road map of strategies and actions for the commercialization of advanced technologies. The model breaks down into twelve activities that describe the process to maximize the chances for success. Each sequence has a technical stage, a market stage and a business stage. The model is a framework for measuring progress in the different stages, namely identification of information and technical assistance needs, project development costs and the forecasting of financing requirements. It follows a quite specific, ordered process. A deficiency of the Goldsmith model is its lack of flexibility regarding feedback, since it is linear by nature (Rosa and Rose, 2007).

2.5.1.1.2 Model of Rothwell and Zegveld

According to this model, commercialization is an integral component of the innovation process. Diagrammatically, innovation and commercialization model of Rothwell and Zegveld (1985) is sequential, but it allows feedback between components. This model combines market needs (market pull) and technological opportunities (market push) that give rise to innovation. Development and commercialization components interact to create technology opportunities and satisfy the demands of the market (Rosa and Rose, 2007; Dereje, 1988).

2.5.1.2. Functional approach

From the standpoint of the firm, commercialization is an integral part of the innovation process and may be described as putting in place a set of conditions and elements or activities that the firm must necessarily fulfill in order to generate income from goods or services innovations introduced respectively in the marketplace and in the production system. In this model ideas are central to the commercialization process. These ideas are conveyed by all the participants in the process, including the customer and the supplier, who may at any time interact and incorporate

new elements. New ideas that generate innovation can arise at any stage in the commercialization process, be it the development (R&D) stage or after the product is brought onto the market. Goods and services that reach the market are subject to the law of supply and demand, and they therefore adapt and continue to evolve. The evolution of the product once it is on the market is thus an element in the commercialization process where, for example, the service and customer support function comes into play(Rosa and Rose, 2007)..

According to WIPO (1999) it is also important to evaluate the commercial potential and risks of the invention. It may include following stages:

- Marketability, market potential and competitiveness;
- Novelty, inventiveness, patentability;
- Level of technology involved;
- Manufacturing viability;
- Operational issues;
- Business potential and environment; and
- Commitment and skills of the inventor, entrepreneur and management.

2.5.2. Elements and Activities of Commercialization Process

According to Rosa and Rose (2007) there are four categories of elements and activities of commercialization process:

1. Transfer and creation of knowledge
    - Knowledge of scientific principles behind the invention/idea
    - Knowledge of market conditions for inputs and outputs
    - Knowledge of legal and legislative framework for finances and management

2 Skills acquisition, development and training

- To go from the scientific discovery stage to the concept
- To manage intellectual property.
- To control the growth process
- To develop access to the market.

3. Financial and physical resources

- Identify and find the financial capital required for the commercialization process
- Identify and find human resources, physical capital, inputs required

4. Organizational management

- Identify potential customers and suppliers
- Identify and apply own business management model to manage the commercialization process effectively
- Choose the strategy or strategic combination for technology acquisition
- Identify obstacles to commercialization

Successful commercialization allows the firm to satisfy its customers' needs in terms of the cost, speed, quality, and newness attributes of their technologies (Zahra and Nielsen, 2002). In addition, successful commercialization is crucial for the survival of the firm in light of quick changes in the business environment. Business rise or fall depending on whether or not they can discipline their commercialization efforts and government policies can help or hinder firm's success. Government affects standard of setting and the nature and scope of property rights, and can empower commercialization by financial support of local innovation (Caerteling, J. S et al., 2008).

While patenting measures invention, commercialization requires the additional steps of translating inventions into consumer needs and product markets. At its earliest stages, before applications are easily described or generally appreciated, realizing the potential of an invention requires a sophisticated understanding of consumer needs, existing markets for product innovation and factor inputs. Commercialization, even when ideas are abundant, may not be completed because outcomes are highly uncertain, risk aversion may cause projects to be delayed or abandoned or the relevant organizations may not be able to collaborate.

2.6 Invention and Commercialization in Ethiopia

2. 6. 1. Science and Technology Policy in Ethiopia

The Ethiopian Government issued the National Science and Technology Policy in 1993 in response to the realization of the country's weak science and technology capacity and recognition

of the role of science and technology for development. The major objectives of the policy include building capability to generate, select, import, develop, disseminate and apply appropriate technologies; and improving the knowledge, culture and the scientific and technological awareness of the peoples of Ethiopia. Currently Ethiopia is in the process of formulating a new national science, technology and innovation policy since the existence of huge gap between the policy and its implementation. Concerning the institution, the Ethiopia Science and Technology Commission was established in December 1975. Following the change in government in 1991 the commission was re-established in March 1994. The commission went into its third phase of re-institution on 1995 following the establishment of Federal Democratic Republic of Ethiopia as an Agency. At present it established as Ministry of Science and Technology by proclamation no.603/2008. Some of the powers and duties of the ministry (see for the detail Proclamation no. 603/2008) are the following:

- Prepare science, technology and innovation master plans,
- Direct, coordinate and support science, technology and innovation activities,
- Collect and organize information on science, technology and innovation
- Establish and implement a system for granting awards and incentive to individuals and institutions
- Assist and encourage the establishment of association that contribute to the development of science , technology and innovation

2.6.2. Barrier of Invention in Ethiopia

Ethiopia is a country that is endowed with good resource potential for development. However, it is generally classified as a least developed country that faces a wide range of socio-economic problems such as poverty, unemployment, low level of agricultural productivity and severe public health problems. In addition, the process of carrying through ideas from internal to some practical results and value is extremely difficult due to a number of constraints

Mulugeta (2004) observed three main innovation constraints in Ethiopia. First, there seems to be an acute cultural difficulty. According to him, we belong to a culture which generates many ideas but is not capacitated to see them through development and fruition. This antipathy manifests itself both economically and managerially in such things as lack of government policy support,

lack of venture capital, lack of supportive organization structures, and lack of incentives. Second, the innovation process itself is often not very well understood and ideas are not generated in any conscious or systematic way within organization. Third, there is a critical limitation of capacity to manage the process of innovation (Ibid)

A wide set of indicators can be applied to measure the competitiveness of the national innovation system in terms of what it produces. Some of the more common include (i) the share of high-technology products in exports, as a measure of the ability to compete internationally in technology; (ii) registered patents, as a measure of the output of possible marketable new innovations; and (iii) scientific publications, as a measure of how competitive the academic community is. A common problem with these indicators is that they are more appropriate for more developed countries with modern economic structures and institutions (IKED, 2004)

Of course, Ethiopia's exports have no high-technology content. In this regard, Ethiopia is not different from other African low-income countries. Other more traditional indicators like patents and scientific articles similarly indicate very little effectiveness of Ethiopia's innovation system (Ibid)

According to IKED (2004) a complementary approach in order to gauge the potential of the innovation system is therefore to examine its inputs and the linkage. Surveys of the private sector indicate that the perception in the Ethiopian business community is that there is very little spending on research and development taking place. Human capital is a key driver of innovation and economic growth. However, in Ethiopia, education outcomes are low and limited skilled workforce has greater difficulties in the path of economic development (Mulugeta, 2004). Further, the quality of science and math education, as measured by scores in international tests, is inferior. At the same time, the government has limited access to experts and skilled officials that can service strategic functions in development projects (IKED, 2004).

Another key feature of the innovation system is access and reliability of physical infrastructure. How can entrepreneurs access new ideas, if they are not exposed to them, and how can they implement and produce them, if there is no electricity to run machines and computers, roads to

transport products and perform services, or phone lines to talk to customers and suppliers? Infrastructure access and effectiveness appear to be critical deficiencies in Ethiopia (Ibid).

Besides, the Ethiopian market is characterized by low buying power that provides very limited space for development and expansion of innovation activities. Similarly, the treatment of research and development spending in the financial account and the existing bank lending regime, the monitory policy and credit market are making it difficult to raise venture capital to transform proven ideas to marketable goods (Mulugeta, 2004). The formal banking system is also focused on short-term credit based on collateral only which needs to reach over 100 per cent of a typical loan's value. The demands on collateral are a problem for small innovative firms who may have the potential to grow but whose main assets may be intangible. This in effect discourages the development of innovation activities of enterprise.

The same study stated that collaboration between firms and universities appears also to be weak. A numbers of studies have underlined the potential importance for local development of establishing local exchanges of information and joint efforts in knowledge upgrading. The so-called cluster literature points to various ways forward, but also to the presence of pitfalls and what tends to be required for supporting success, including that various local players are able to specialize and combine incentives for cooperation and competition (Andersson et al., 2004 cited in IKED, 2004). Survey-data indicate that there is very little cluster development in Ethiopia, compared to the average for the African, South Asian, and East Asian regions. And, importantly, local universities and private companies do not collaborate in research and development to any great extent (Ibid).

Besides, higher learning institutions, research and development organization as well as business entities in Ethiopia are less aware of the importance of protection of intellectual property assets and the resulting economic benefits albeit intellectual property rights were not available in Ethiopia until recently(Getachew, 2006). In addition, strong cultural values to the status quo and extreme caution and fear to change inhibit innovation (Mulugeta, 2004).

2.6.3. Intellectual Property in Ethiopia

2.6.3.1 Intellectual Property Institutional Framework in Ethiopia

The Federal Democratic Republic of Ethiopia Constitution (1994) article 44 stated that every one has the right to own property; property includes both tangible and intangible property owned by individuals, organizations and communities and the federal government shall patent inventions and protect copyrights. In Ethiopia, intellectual property administration had been fragmented. For example, the then Ethiopia Science and Technology Commission was responsible for the administration and management of matters related to patent, utility models and industrial designs; The Ministry of Youth , Sport and Culture was also handling copyright related matters and the management and handling of trademarks was made by the Ministry of Trade and Industry (Getachew, 2006).

Recognizing such fragmentation had a number of adverse effects and realizing the need for and advantages of bringing the administration of different component of intellectual property under one umbrella, the government established the Ethiopian Intellectual Property Office as an autonomous government body on April 8, 2003 by the Proclamation No 320/2003 and currently the office is accountable to the Ministry of Science and Technology. According to Proclamation no.320/2003, the objectives of the office are:

1) To facilitate the provision of adequate legal protection for and exploitation of intellectual property in the country
2) To collect, organize and disseminate technological information contained in patent document and encourage its utilization
3) To study, analyze and recommend polices and legislation on intellectual property to the government, and
4) To promote knowledge and understanding of intellectual property among the general public

In addition, the same proclamation outlined the powers and duties of the office. The following are some of the powers and duties of the office:

- ✓ To follow up the exploitation of legally protected foreign and local invention and issues compulsory licenses when necessary

- ✓ To popularization of intellectual property among the general public and potential users
- ✓ To promote the commercialization of intellectual property assets protected by intellectual property titles
- ✓ To facilitate the establishment of support and strength inventions, authors and musician associations as well as similar societies
- ✓ To facilitate conditions that will help to create linkage between intellectual property owners and entrepreneurs who wish to exploit their creative works

2.6.3.2 Patents and Utility Models in Ethiopia

Inventions have played much to economic, social, political, cultural and others development of the society. From primitive era to the present world, man is effectively utilizing what is in his hands through inventions. Inventions could be of many kinds and subject for protections. However, there was no specific legislation that dealt with patents, utility models and industrial designs until May 1995. This legal gap had a number of adverse effects on the county. It hindered the promotion of indigenous inventive and innovative activities as well as the transfers of foreign technology (Getachew, 2006). Cognizant of the problems and the importance of such law, the Government enacted the proclamation concerning Inventions, Minor Inventions and Industrial Designs by Proclamation No.123/1995.

The main objectives of the proclamation are:

- ➢ To fulfill the nation's multidimensional demand for a harmonious scientific and technological progress, to be used for the public benefits, shall be most effectively served when there exists an appropriate legal framework
- ➢ To create favorable conditions in order to encourage local inventive and related activities thereby building up national technological capability, and
- ➢ To encourage the transfer and adaptation of foreign technology by creating a conducive environment to assist the national development efforts of the country

To achieve these objectives a number of provisions (Proc No.123/1995 and Council of Ministers Regulations No. 12/1997) have been incorporated for patents, patent of introduction and utility models.

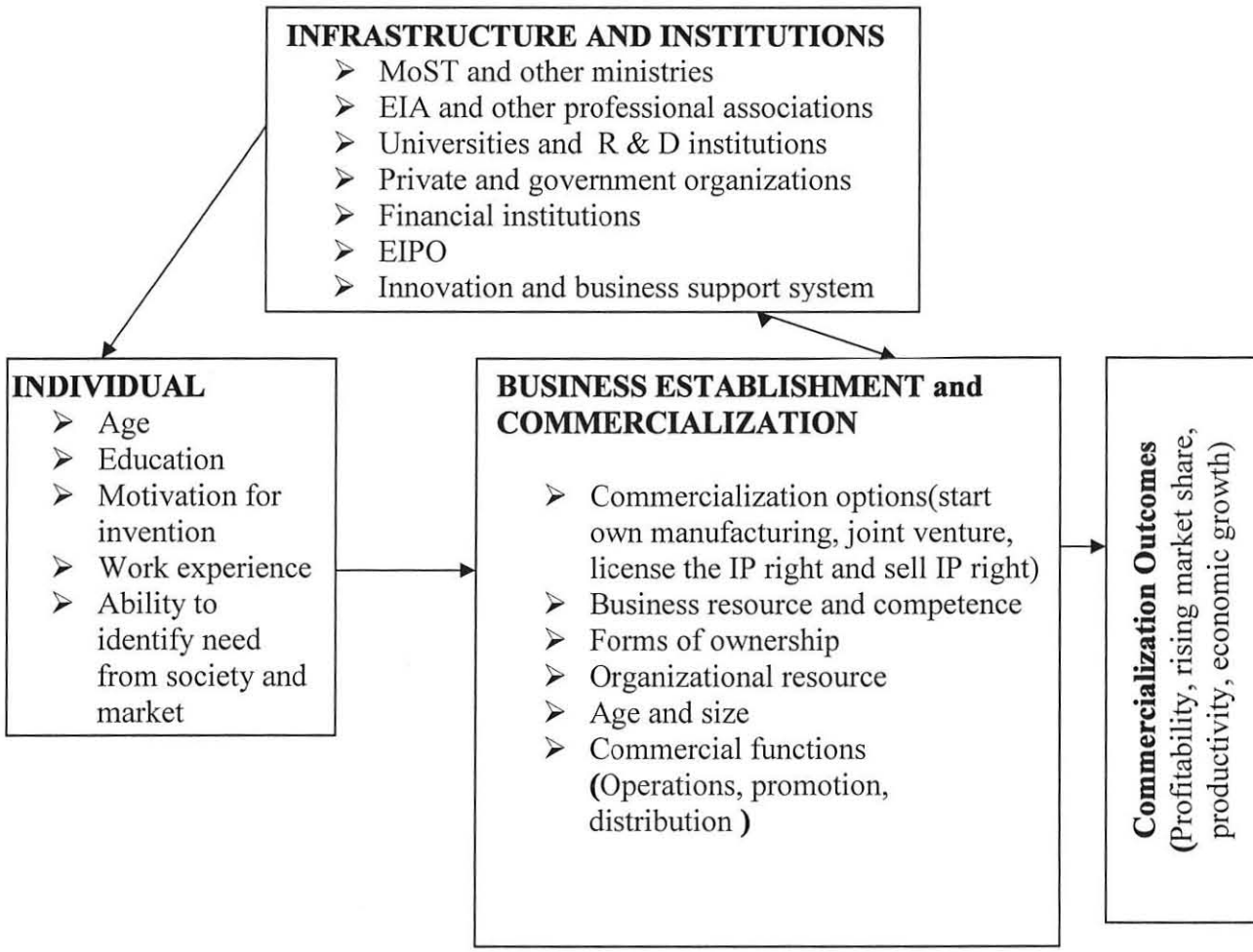
According to Proc No.123/1995 Art.2 (5) and Art.3, a patent is granted to a product or process invention which is new, involves an inventive step and is industrially applicable. The fact that the three criteria of patentable are met is not enough for the granting of a patent. The invention must not also fall into the category of excluded subject matters (See Art 4(1) for detail). The same proclamation also stated when an invention is found to meet the requirement of the law, a patent will be granted for an initial period of fifteen years. The duration of the patent may be extended for an additional five years if it is proved that the invention has been utilized in Ethiopia.

Utility model in Ethiopia is described in sub-art. 1 of art. 38 begin by saying "a minor invention...." Hence one is at liberty to define utility model for a minor invention. In this proclamation definition, utility model is protections of minor inventions which is fit for practical use or possess novelty and industrial applicability which do not strictly qualify to be patentable. Such right is protected by utility model certificates [Art. 38(2)].

The issue following is, therefore, that what does the word "minor" stands for? From this definition, it is clear that the word" minor" signifies a thing which has lesser significance, comparatively speaking. It means that whether an invention is minor is to be determined via comparisons as it is very difficult to set objective standards. However, unlike a patentable invention, the requirements for utility model protection are less stringent. A lower degree of novelty is required and the inventive step requirement is not considered in the case of utility models. ESTC (2001) identified that most of invention in Ethiopia involve small adaptations of existing technologies that can have a positive impact on the socio-economic development efforts of the country. Therefore, it is logical to have s system of protecting such activity through a utility model system. The utility model protection is thus believed to be considered promotional force to the innovative efforts which small and medium sized enterprises are currently making in the country (ESTC, 2001). As a result the number of applications filled for utility model certifications constantly growing (See table 2.1). According to Getachew (2006) the total numbers of applications granted up to July 6, 2005 were 136 filed and 65 under process. Currently there are more than 200 utility models granted in Ethiopia.

This study gives due emphasis on the factors and issues of local minor inventions commercialization. It assesses, for instance, personal characteristics of minor inventors or utility model holders or firm ability on its technical capacity, organizational ability and knowledge of the market taking into account its intellectual property protection. On top of this, it also assess their ability to harness necessary complementary assets or support needed to make their minor invention more useful, capabilities in manufacturing, marketing activities, and distribution needed for success, and operational issues. Diagrammatically, the conceptual framework that guides the study can be summarized as follows.

Figure 2.2 Conceptual Framework



Source: Developed by the researcher, 2010

Chapter Three

Methodologies and Study Area Description

3.1 Methodologies of the Study

3.1.1 Study Design

The study is an exploratory and descriptive type as it tries to explore and at the same time to describe the factors and issues of local minor invention commercialization in Addis Ababa. Study design may vary depending on the purpose, objective and nature of the research. Survey design which is mostly used in social research was applied under this study. Particularly cross-sectional survey is used instead of longitudinal approach owing to the study's constraint of finance and the limitation data. Unlike the longitudinal approach, cross-sectional survey method is efficient for one time data collection and analysis which make the researcher keen to use it to undertake the study.

The researcher made an initial contact with EIPO personnel so that they enabled him to get names, telephone number and other data regarding minor inventors who are granted utility model and to identify the appropriate classification of minor inventors. Once the researcher has identified who to embrace in the study, initial contacts through telephone for arranging meeting had been undertaken. Key informant discussions with the experts and officials had been undertaken.

3.1.2 Population and Sample

According to Ethiopian Intellectual Property Office total number of local minor inventors or utility model certification granted numbered 209 as of December 1, 2009. Of which 163 (78%) are found in Addis Ababa. These are categorized as follows (Table 3.1)

Table 3.1 Category of Local Minor Invention

No.	Sectors	Number of Minor Invention
1	Basic metal and engineering	71
2	Food and Beverage	9
3	Energy	13
4	Water	10
6	Health	4
7	Environment	5
8	Transport and communication	7
9	Chemicals	6
10	Auto	8
11	Telecommunication	5
12	woodwork	5
13	Construction	7
14	Others	13
	Total	**163**

Source: Own classification based on EIPO, 2009

Since there is high diversity of minor invention it was categorized sector wise in consultation with pertinent bodies of the Ethiopia Intellectual Property Office. To reach valid conclusion about factors and issues of minor invention commercialization in Addis Ababa a purposive sampling was used. Since effective commercialization strategies seem to differ across industrial sectors (Gans, 2003). The research is reliant on data acquired from respondents pertaining basic metal and engineering sub sector because majority of minor invention fall under this category. According to National Industrial Science and Technology Policy of Ethiopia (http://.clictoconver.com) basic metal and engineering sub sector includes the designing and manufacturing agricultural tools, machinery, spare parts, components, hand tools and equipment for the industrial sectors. The total number of utility model holders in this sub sector in the periods between 1986 and 1999 EC are 54. A total number of 43 minor inventors or utility model holders were interviewed from basic metal and engineering sub sector in Addis Ababa. The total numbers of respondents are about 79.62% of the total number of the sub sector.

3.1.3 Data Collection

3.1.3.1 Data source

The study deployed both primary and secondary sources. The primary data sources were minor inventors, experts and officers at EIPO and MoST and members of EIA. The diversification of respondents was believed to triangulate the information obtained and to increase the validity and reliability of the data Moreover, secondary data were collected from relevant documents such as books, articles, magazines, news papers, statistical reports and above all from documentary records of EIPO and MoST.

3.1.3.2 Data Type

The study makes use of both qualitative and quantitative data types. The former were data collected from key informant interviews and response from structured questionnaires which could not be quantified numerically.

3.1.3.3 Data Collection Techniques

This study has employed selected data collection techniques such as structured questionnaires, and key informant discussions. Close-ended structured questionnaires were used to collect information that does not need further explanation where as semi-structured questionnaires were used to collect information that needs further probing. Key informant discussions are chosen to collect general information from EIPO, MoST and EIA.

i. Questionnaires

The questionnaire consists of both open and close ended questions. Before the actual data collection process, the questionnaires were pre-tested and subsequent necessary modification was taken.

ii. Key informant Discussion

In addition to the above instrument, key informant interview were used to gather information from relevant offices. Semi structures checklist were also used to guide key informant interview. In this approach, patent search expert and patent administration head, patent director directorate, EIPO general director in EIPO and key personnel in MoST and members of EIA were included.

iii. Personal Observation

In order to triangulate, the accuracy of information gathered using the preceding instruments, personal observation of the researcher on invented products and business establishments were made

3.1.3. 4 Method of Data Analysis

Initially, the data cleaning process was conducted to identify any missing value and to take corrective measures by cross-checking the corresponding questionnaires. To make the analysis simple, response gathered from closed and open-ended questions were edited and categorized. The coded responses were fed in to computer and were analyzed using a soft ware SPSS version 16 (Statistical Package for Social Science) some of which were presented in frequency table. Descriptive statistics such as frequencies, percentages means, and standard deviations were used to describe and analyze quantitative data. In addition, cross tabulation from the descriptive statistics for some key variables of the study were produced to show the existing relationship between these selected variables.

Besides, the researcher was used narration to analyze and present the qualitative data. More specifically, data gathered through key informant interview, personal observation and open-ended questions are analyzed through narration.

3.2 Description the Study Area

3.2.1 History of Addis Ababa

Addis Ababa is the capital city of Ethiopia and it is the commercial, manufacturing, and cultural center. It is situated in central Ethiopia at an elevation of about 2440 m (about 8000 ft) above sea level on a plateau that is crossed by numerous streams and surrounded by hills. The city was founded in 1887 at the site of a hot springs by Emperor Menelik II and his wife Taitu, having 50,000 inhabitants. Most of them were militants with their family and was given the name Addis Ababa; "new flower" in Amharic .it was first established as military base due to its topographic advantage then after continued to grow haphazardly without any planning intervention. It became the national capital in 1889 and currently serving as the official diplomatic capital for African Union (AU), United Nations Economic Commission for Africa (ECA) (Redmond, 2006).As far

as population is concerned, according to Ethiopia Population Census Commission report (2008) Addis Ababa has a total population of 2,738,248, consisting of 1,304,518 men and 1,433,730 women. The city is fully urban, with no rural dwellers within the city's administrative boundaries. Annual average growth rate of the population is 2.1.

3.2.2 Topography and Climate

Addis Ababa has a Subtropical highland climate The city possesses a complex mix of highland climate zones, with temperature differences of up to 10 °C, depending on elevation and prevailing wind patterns. The high elevation moderates temperatures year-round, and the city's position near the equator means that temperatures are very constant from month to month. Addis Ababa lies at an altitude of 7,546 feet (2,300 meters) and is a grassland biome, located at 9°1′48″N 38°44′24″E9.03°N 38.74°E Coordinates: 9°1′48″N 38°44′24″E9.03°N 8.74°E. The city lies at the foot of Mount Entoto. From its lowest point, around Bole International Airport, at 2,326 meters (7,631 ft) above sea level in the southern periphery, the city rises to over 3,000 meters (9,800 ft) in the Entoto Mountains to the north. Its high elevation gives the city a mild, pleasant climate (www.wikipedia).

3.2.3 Administrative Structure

Addis Ababa is a self-government chartered city with its own city own council. The council which is elected every five years is accountable to both the city electoral and the Federal Government. It has also a city manger, who is responsible for municipal activities. Similar organizational set-up exists at the lower level of the city administration. The administration structure is divided into three hierarchical level having 10 sub cities at the intermediate level namely Arad, Addis Ketema, Lideta, Kiros, Bole, Nifas Silk-Lafto, Yeka, Akaki-Kaliti, Kolfe-Keranio and Gullele(see map of Addis Ababa annex 2). And 99 kebeles at the lowest administrative level (WWW.addisaababacity.gov.et). Addis Ababa City Government announced the numbers of kebeles will be increased to 117 starting from 'Hamel'1, 2002 EC.

Chapter Four
Results and Discussion

In the preceding chapters, an attempt has been made to assess the basic theoretical and conceptual frameworks, and basic characteristics of the study area that are supposed to serve as stepping stones for the analysis. In this chapter, the basic socio-economic characteristics of respondents, current condition of minor inventors and characteristics of business establishments are described. Moreover, factors and issues of local minor invention commercialization are analyzed.

4.1 Characteristics of Respondents

In this section, the demographic characteristics are described. Basic demographic variables: age, marital status, sex, level of education and occupation are summarized to offer bird's eye-view to readers on the general characteristics of the studied population.

4.1.1 Demographic Characteristics of Respondents

This study is based on 43 minor inventors. Understanding the demographic of respondents is essential in order to conduct any type of analysis regarding them. As it is indicated in Table 4.1, the sex structure of respondents reveals that all respondents are male. While the researcher review the profile of intellectual property right protected at EIPO finger-counted women are certified in other sectors for instance chemical and construction. Besides, their numbers relative to utility model are large in industrial design particularly traditional cloth design. This indicates that the involvement of women in local inventing and certifying their invention is insignificant. This dominance of men in minor inventing does not help to conclude that gender is an important factor in inventing rather may indicate the factors related to less opportunity in education and employment. In addition, social environment may not encourage women in such creative endeavor.

With regard to marital status and educational level, as it is indicated in Table 4.1, most of respondents (60.5%) are married while the rest 30.2%, 7% and 2.3% are not married, divorced and separated respectively. Education system is one of the components in Arnold and Kuhlman (2001) generic national innovation system. Educational status of minor inventors is one of the

factors that could contribute to their invention. With regard to this, an effort was made to identify the educational status of respondents. The same table shows that 4.7%, 14% and 9.3% had completed grade eight, grade ten and grade 12 respectively. TVET graduates constitute 14 %. Twelve of them which constitute 27.9% are first degree holders followed by some years in university/college and advance diploma holders (25.6%). The rest 4.7 % are masters' degree holders. These figures give no reason to believe that certain kind of education is more likely to induce invention. However, they do lead us to believe that a relatively high level of education is an important asset in inventing.

As far as respondents' age structure is concerned, collected data reveals that 39.5% of them are found in the age category between 26 and 35 years and the category between 36 and 45 year accounts about 9.5%. The rest, 7% and 14 % found between 46 and 55 years and above 55 years respectively. From these data, it is evident that most of the respondents (79%) found in the active work force category, which has an affirmative implication for development assuming that they can invent more economical valuable new products or process or methods in the future. In view of the fact that ways to compete and raise standard of living is to find new and better ways to use natural, human, and capital resources to increase productivity.

Table 4.1 Demographic information of Minor Inventors

Demographic variables	Description	Frequency	Percent
Educational level	Grade 5-8	2	4.70
	Grade 9&10	6	14.0
	Grade 11&12	4	9.30
	Technical and Vocational Training	6	14.0
	First degree	12	27.9
	Masters degree	2	4.70
	Some years in university/college and advance diploma	11	25.6
	Total	**43**	**100**
Marital status	Not married	13	30.20
	Married	26	60.50
	Divorced	3	7.00
	Separated	1	2.30
	Total	**43**	**100**
Sex	Male	43	100
	Female	00	00
	Total	**43**	**100**
Age	26-35 years	17	39.50
	36-45years	17	39.50
	46-55years	3	7.00
	>55years	6	14.00
	Total	**43**	**100**

Source: Field Survey, 2010

4.1.2 Occupation and Research before Inventions

Work experience gives a person the required technical skill and necessary contact. Besides, it gives the opportunity to identify the gap between needs and/or problems and induce individuals

to devise mechanisms to solve the problem of fill the gap. Associated with the occupation before or during inventing Table 4.2 indicated that 90.7 percent of respondents were employed before inventing. About 9.3 percent of them were unemployed. The questionnaire survey also revealed that 76.7 percent, of those who had occupation before invention, their experience contributed significantly to their inventions. This implies that they have learned some skills from their past employment. One can safely suggest that work experience helped to acquire some skills and knowledge to invent. However, the absence of such experience does not preclude a person from inventing, but improve the chance of success in the area of inventing. In addition, business enterprises/employers should create conducive environment for their employees to encourage intrapreneurships (entrepreneurship within an existing business) and exploitation of inventions created within and outside the firm.

In addition, respondents were also asked whether they conducted research before inventing. As it is indicated in Table 4.2 72.1% of them conducted research for identification of needs and wants of the society or market. Among respondents who conducted research, 21(67.75%) of their researches were feasible. While the rest 10(32.25%) did not conducted research at all.

Table 4.2 Occupation and Research before Inventions

Descriptions	**Response**	
	Yes	**No**
Work experience/occupation before/during invention	39(90.7)	4(9.30)
Significance of experience/occupation contribution to inventions(N=39)	30(76.70	9(23.30)
Research before inventing	31(72.10	12(27.90
Feasibility of research(N=31)	21(67.75	10(32.25

Source: Field Survey, 2010 Figures in bracket are percentages

In addition, the respondents were also asked about their most powerful motive for their invention. They mentioned sense of achievement, to own business, curiosity, solving societal problem, technological transfer, environmental protection, and for hard currency saving. It is astonishing to note that most of the minor inventors (39.5 %) are motivated by desire of achievement. The next motivational factor for their inventing is for solving social problem, which accounted about

30.2%. These imply that minor inventors are inventing incremental products in the context of problem solving as in neo-classical theory and individual creativity encouraged by social conditions. Thirdly, to own business as motivational factor constitute about 9.3% implies that very few inventors did inventing effort to establish business by themselves to commercialize. Hence, it leads other options of commercialization are more important. To create a market value from their endeavor or solving societal problems can result from the sale of intellectual property, it's licensing to the private sector, or forming joint venture or selling IP rights or a combination of these should be strengthening (Gault, 2008).

Table 4.3 Minor Inventing Motivation

Most powerful motivation for inventing	Frequency	Percent
Desire of achievement	17	39.5
To own business	4	9.30
Curiosity	3	7.00
Solving societal problem	13	30.20
Curiosity and solving societal problem	1	2.30
To own business and solving societal problem	2	4.70
To own business and curiosity	1	2.30
Technological transfer and hard currency saving	2	4.70
Total	**43**	**100.00**

Source: Field Survey, 2010

4.2 Utility Model

Intellectual property rights in general and utility model in particular hold key significance in the development and commercialization of new products. Therefore, countries should have appropriate police and strategy to creation and promotion of awareness of the importance of the intellectual property system. In this regard, respondents were also asked the source of information about utility model certification availability and why applying for utility model. As Table 4.4 indicated below, most of the respondents (58.13 %) got information about the availability and uses of utility model from their relatives. The rest from newspapers, radios,

televisions and their work experience. These imply that the majority of source of information about utility model is informal. According to key informants' discussion, EIPO has been engaged in the creation and promotion of awareness of the importance of intellectual property system using print and electronic media as well as using different option as workshops, exhibitions and intellectual property day. However, the print media titled 'Intellectual Property Gazette' published quarterly by the office is not circulated among the concerned parities for instance local inventors, entrepreneurs, business community, research institutions, higher learning institution to mention a few. Beside, the contents of the Gazette are not in the desired levels to attract the stakeholders.

Regarding the question for what purpose they applied, most of respondents (55.8%) said that for legal protection and (23.25 %) of them applied for the purpose of legal protection and gain support. These imply majority of minor inventors understand the use of IPR as a legal framework of protection, they can receive sufficient compensation for the time and capital they have invested and thereby inducing them to make new inventions. The recognition and protection of IPRs may help to stimulate the generation, development and commercialization of IP assets only when rights are enforced in the event of their infringements. Beside, significant number of minor inventors also applied for the purpose to gain support. However, utility model certification did not used as a criterion by the Ministry of Science and Technology for National Award for Best Achievement in Science and Technology in the categories of invention award, innovation award, science and technology dissemination and popularization award, institutional award. Reason for this as discussed with key informants revealed that to encourage those enterprises/individuals that had developed minor invention or incremental products and not interested in intellectual property protection through utility model certification but invaluable to the country. On the other hand, this shows that the usefulness of legally protecting IP for support or as criteria for competition for prize is negligible. Therefore, EIPO should work out mechanisms that make use of utility model besides to its legal protection.

In addition, attempt was made to identify the importance of utility model for those who established business enterprise. The survey result revealed that most of respondents who established businesses to commercialize their minor invention (69.23%) did not highly appreciate

the importance of utility model. Lack or inadequate legal enforcement mechanisms make utility model less importance for business success as a competitive tool. As a result, such conditions did not motivate them to pay annual protection fees to EIPO. This implies that the national intellectual system may not help to attain the intended objectives on its own. Therefore, there should be complementary policies that create an enabling environment for the creation, development and exploitation of IP assets.

According to Oyelaran-Oyeyinka (2006) macroeconomic conditions such as loans, subsidies to private provision of innovation, financial services, export credits; taxation: company, personal, indirect and payroll taxation and tax allowances play significantly for the creation, development and exploitation of IP assets. However, such measures are not yet put in place. As discussed with key informants, the current monetary and fiscal polices do not encourage the generation and exploitation of IP assets. There is a need, for instance, to revisit monetary policy to improve access to credit, which could use IPR as collateral to convert IP assets for instance promising innovative ideas into products and service. Moreover, fiscal policy should be revised to give tax incentives to encourage the creation, development, and commercialization of IP assets. Therefore, as key elements of the national infrastructure for long-term industrial, commercial and technological viability, a sound intellectual property system must link the county's innovative and productive energies with technological and commercial activities.

As Table 4.4 shows, number of applicants for utility model increased consistently. This implies that the awareness creation, the less stringent requirement for acquiring utility models and associated smaller costs enabled many Ethiopian minor inventors tried to take advantage of the protection accorded by such mechanism. Moreover, respondents were also asked about time taken for their certification. Majority of them (71%) replied the process took more than six months. This implies that utility model certification process has taken longer period as compared on average in most countries where utility model protection is available (www.wipo.org/sme/en/ip_business/utility_models/). Among the factors that make such longer periods, they pointed out excessive procedure, lack of required information at one time contact, and high application and certifications fee to mention a few.

Table 4.4 Sources of information, Purpose, Year of application, Time taken of Utility Model

Description	Response	Frequency	Percent
Source of information for utility model	News papers	3	7.00
	Radios	5	11.62
	Televisions	6	13.95
	Relatives	25	58.13
	Work experience	4	9.30
	Total	**43**	**100**
Purpose of applying for utility model	Legal protection	24	55.81
	To reserve the right	2	4.65
	To gain support	7	16.27
	Legal protection and to gain support	10	23.25
	Total	**43**	**100**
Year application for utility model	1986 -1890 (E. C)	6	13.95
	1991-1995(E. C)	11	25.58
	1996-1999(E. C)	26	60.46
	Total	**43**	**100**
Time taken for utility model certification	Less than 6 months	12	27.90
	7 to 12 months	14	32.55
	More than12 months	13	30.23
	Not remembered exactly	4	9.93
	Total	**43**	**100**

Source: Field Survey, 2010

To improve the service delivery, EIPO prepared applicant's guides for patent/utility model, industrial design, technological information service which contain about contents and drafting of application, procedure for filing and processing of applications, example of patent application, and fee schedules. However, there were finger-counted copies of such guide available in the office while the researcher collects the required data from the office. Preparation of such guide is appreciable and offering such guides to applicants facilitates certification process. Besides, the office can provide information to minor inventors, users or stakeholders through the office web

site because the advance of internet usage in Ethiopia. However, it is not operational until finalized this study report.

As far as fee is considered, application fee is USD 8.75; grant and publication fee is USD 56.25 and annual fee year 2 to 5 per year is USD 7.5; when the term is extended annual fee for each year USD 12.5. Such fees for those who do not start business and make money and invent using their little amount of saving from their daily income become high. However, key informants explained additional factors that prolong the certification process as majority of applications did not fulfill the requirements for contents of a request among other include description, claims, an abstract and drawings where necessary. This is crucial for examination of application and must be undoubtedly and vividly described. However, coupled with lack of IP agency in the country and fear of disclose information about the new minor invention to some one else who may help them in drawing and preparing application, their application were not as the standard. Applicants may not satisfy these requirements in the short time period. In some cases, they may not come to the office again. Therefore, the office should revisit its fee schedule or reducing significantly or postpone the payments or in some case make them free from fee. Besides, assist them in preparing the required application on time.

4.3 Status of Minor Inventors

Business enterprises are the major translators of invented products into tangible products and service. Decisions to commercialize inventions made by individuals/firm and closely linked to characteristics of the innovation system in which the firm operates. Manufacturers must assess the likelihood of securing funding from internal and external sources, their ability to develop or gain access to manufacturing equipment and supplies, and the size of potential markets. Among the study population of minor inventors (i.e. 43) only 13 (30.2%) established business for the invented products. The rest 30(69.8%) did not establish business enterprise for their invented products or commercialized using other options described earlier. The collected data also revealed that the establishment of business for invented product is constrained by excessive procedure, shortage of finance, lack of skilled manpower; shortage of land, lack of experience , estimated high cost of production; lack of knowledge of market and others including inventors own personal problems, low commitment, and busy for another job. As it is indicated in Table

4.5, the respondents identified shortage of finance, shortage of land, and lack of experience as the most three constraints.

Table 4.5 Major Constrains to Establish Business

Major constrains to establish business for the invented product	Rank Frequency			Sum of the three rank
	First	Second	Third	
Excessive procedure	3	0	0	3
Lack of skilled manpower	1	0	1	2
Shortage of finance	18	8	3	29
Shortage of land	3	11	5	19
Lack of experience	0	3	10	12
Estimated high cost of production	0	3	7	10
Lack of knowledge of market	0	2	2	4
Personal problems, low commitment, busy for another job	5	3	2	10
Total	**30**	**30**	**30**	

Source: Field Survey, 2010

Intellectual property right in general and minor invention in particular can be commercialized in four options as describe in chapter two. These are starting own manufacturing by inventor or searching joint venture or sell the IP rights and license the IP right or a combination of these. With regard to this effort was made to identify what measure was taken by local minor inventor to commercialize their legally protected inventions. From Table 4.6, one can see that most of the minor inventors (i.e. 70 %) have looked for support to commercialize the invented products. Among supports requested organization/institutions and support areas requested include kebele/sub city administrations for land, production improvement center for technical facilities, ministry of energy and mineral and NGOs for fund. However, the response is not satisfactory. In addition, about 43.3 percent of respondents are also searched partners. Among these respondents

the results of their search, about 70% of them did not found partners while the remaining 30% of them found partners. However, they did not agree on terms and condition for establishing business. Regarding to their attempt to sale utility model only 26.6 % tried to sale but not succeed.

From this discussion, one can conclude majority of local minor inventors if they found support and facilities they will establishes business by themselves than in the form of joint ventures and selling their utility models. This may due to lack of business organizations that purchase utility model or intellectual property right to manufacture products and lack of individual or business to start business as partners for minor invention. Of course, those who invented minor or incremental products are highly responsible for their inventions, other institutions/organization as well. EIPO is the one expected to play its role to commercialize locally invented products since one of the power and responsibility of the office according to Proc No. 320/2003 Art 6 sub Art 15 is to facilitate conditions that will help to create linkage between intellectual property owners and entrepreneurs who wish to exploit their creative works. Besides, the office is also responsible for follow up the exploitation of legally protected invention (Proc No. 320/2003 Art 6). If the office facilitate conditions, there will be satisfactory result since 27 (90%) of respondents who did not establish business are willing to sale their utility model. One possible reason for this is that the same numbers of respondents are currently employed.

Table 4.6 Measure taken to commercialize minor invented products

Description	Response	Frequency	Percent
Searched partners	Yes	13	43.30
	No	17	56.70
	Total	**30**	**100.00**
Looked for support	Yes	21	70.00
	No	9	30.00
	Total	**30**	**100.00**
Tried to sell utility model	Yes	8	26.60
	No	22	73.40
	Total	**30**	**100.00**
Willingness to sell utility model	Yes	27	90.00
	No	3	10.00
	Total	**30**	**100.00**

Source: Field Survey, 2010

4.4 Profile of Business Establishments

As indicated earlier, among 43 minor inventors only 13 established businesses for their invented product. This section discuss the profile of these business establishments including year of establishments, source and start up capital, land acquisition and its area, forms of business ownership, production efficiency and current capital.

Regarding legal forms of business organizations 70% of the established business preferred sole proprietorship. It is a form of business organization in which an individual introduces, his own capital, uses his own skill and intelligence in the management of its affairs and his solely responsible for the result of his operation. Beside, this form of ownership gives the chance for inventors to maintain direct control of their businesses and own all their profits. On the other hand, owners of proprietorships are personally responsible for all business debts and, because

they are constrained by the limits of their personal financial resources, they may find it difficult to expand or increase their profits. For these reasons, sole proprietorships tend to be micro or small business.

As far as land acquiring is concerned, majority of minor inventors business establishments are operating in rented house from individuals and kebele. Besides, the starting capital is concerned, collected data reveals that in Table 4.10 formal credit institutions (micro finances and banks) did not extending much of their service for starting business for minor inventors since majority of them started using their own saving and family help. From this discussion, one can conclude that the majority of minor inventors that established business preferred sole proprietorship and their size is small.

Table 4.7 Forms of business and land acquisition

Business form of Ownership / How land acquired		Business form of Ownership			Total
		Sole Proprietor-ship	Private Limited Company	Cooperative	
How land acquired	Leased from government	1	2	0	3
	Rented from individuals	5	0	0	5
	Rented from kebele	3	0	1	4
	Bought	0	1	0	1
Total		**9**	**3**	**1**	**13**

Source: Field Survey, 2010

The second legal form of ownership is private limited companies owned by family members. This may be because of the desire to limit liability to the firm's assets. The survey data revealed that only one business established in the form of cooperative.

In the Ethiopian context, using the Federal Micro and Small Enterprise Development Agency (FeMSEDA) classification, firms that have a capital amount up to ETB 20,000 are categorized into micro businesses, while firms that have a capital amount between ETB 20,000 and 500,000 are categorized into small business. Moreover, firms that have a capital amount above ETB 500,000 are categorized into medium business enterprises. Based on this parameter, all business established at the starting fall under micro/small category. As indicated in Table 4.8, there is an average of ETB 41,923.08 and 174,615.38. The survey data reveals that the standard deviation for starting capital and current capital is 94,294.50 and 267,063.21 respectively. These imply that the variability of current capitals of business establishments are more than the variability of starting capital. Currently, only one business enterprise progressed into medium sized business.

Table 4.8 Profile of Business Establishments

Description	N	Minimum	Maximum	Mean	Std. Deviation
Area of land owned (m^2)	13	12	3,000	349.08	806.22
Starting capital(ETB)	13	500	350,000	41,923.08	94,294.50
Total no of employees	13	1	26	7.15	6.94
Production system efficiency	13	1	50	26.69	16.66
Current capital (ETB)	13	5,000	1,000,000	174,615.38	267,063.21

Source: Field Survey, 2010

According to Central Statistic Authority (CSA, 1997) numbers of employees are considered as criteria for classifying business enterprise. Firms that have up to 9 employees are categorized in to micro businesses, while firms that have 10 to 49 categorized are into small businesses. Moreover, firms that have 50 to 99 are categorized into medium business while firms that have more than 100 employees are categorized as large. Based on this parameter, all business at the starting and currently fall under micro/small category. As indicated in Table 4.8, there is an average about 7 employees.

With reference to year of invention covered in the study as long as 13 years ago and recently as delimited 3 years ago. As indicated in Table 4.9, majority of the business enterprise established

Therefore, greater efforts are required to persuade financial organization to be more active in assisting development and exploitation of IP. Perhaps, relevant authority can look into the possibility of adopting a new set of criteria used for the valuation of utility model and other type intellectual property rights. Because, intellectual property rights is a form of property, although intangible, different from other physical property like land or house, but is still a very much-valued asset.

Table 4.10 Credit institutions

Descriptions	Response	Frequency	Percent
Source of capital to start business for invented products	Own saving	8	61.15
	Family	2	15.38
	Loan from Addis MFI's	2	15.38
	Banks	1	7.69
	Total	**13**	**100**
Credit after the business was established	Yes	8	61.53
	No	5	38.46
	Total	**13**	**100**
Sources of credit for those who take credit	Addis MFIs	4	50.00
	Banks	2	25.00
	Relatives	2	25.00
	Total	**8**	**100**

Source: Field Survey, 2010

4.5.2 Supporting Institutions

Innovation is not merely an individual act of learning by a firm or entrepreneur, but is situated within a larger system that both enables and draws on the innovative process. This refers to both the nature of the institutions that make up the system, as well as to the linkages and flows that connect them to one another. Examining closely the kind of intuitional support sought and

obtained by both for those who did not establish businesses and for those who established businesses is explained.

In this regard, respondents were asked about institutions that assist them. The survey data identified supporting institutions which include family and relatives, kebele/sub city administrations, Ethiopian Intellectual Property Office, the then Enterprise Ethiopia (now Ethiopian Centre for Competitiveness), Ministry of Energy and Mineral, NGOs and Productivity Improvement Centre, Ministry of Science and Technology and Ethiopian Inventors Association.

As far as social group is concerned, 28 (65.15%) of respondents were encouraged from their families and relatives in form of moral and ideas, and financial supports. The rest 15 (34.85%) of them did not encourage in any form and performed their inventive activities by themselves alone. As indicated Table 4.11, about some of the support institutions such as kebele/sub city administrations support local minor inventors by providing land/renting houses at low price. Regarding this, seven minor inventors requested for support four of them benefited and established business and the remaining are on the process.

Another supporting institution is EIPO. This office in addition to granting utility model, organize exhibition and prize a few of utility model holders covered under this study. Besides, in some cases the office writes letters for cooperation to other government and non government organizations upon the inventors' request. According to key informants' discussions, minor inventors did not understand the mandate of the office and pointed their finger at the office for their lack of support from different government organizations. Moreover, they stated the lack of a policy that bring together all stakeholders for instance among ministries, private firms, higher institutions, research organization, different associations to mention a few.

The third support organization is Enterprise Ethiopia. It is an integrated capacity-building programme to foster entrepreneurial small and medium enterprises and regional business linkages. The programme is a joint initiative of the Government of Ethiopia, the private sector of Ethiopia, and supported by UNCTAD, UNDP, and the Enterprise Africa Regional Programme. It aims at stimulating the growth of new SMEs as well as existing companies from a cross-section

of the small and medium enterprise sector, particularly in the manufacturing and service industries The primary goal of the Programme is to create success stories of Ethiopian entrepreneurs who would act as role models and generate the required demonstration effect for the local private sector. To achieve this goal, the basic strategy is to identify, screen, select and support high growth-oriented companies or potential "winners", especially those with the best chances to succeed and capable of effectively utilizing programme support. In this regard, three of the respondent participated in the competition one won the prize of ETB 120,000 which will release on phases through Dashen Bank.

Only one respondent discussed about his invention at productivity improvement centre and he received no constructive feedback from the center. According to him the centre lack adequate skilled manpower, spare parts, many of the machines and equipment at the centre are not functional or worn-out and leading unable to assist in the improvement of locally invented products. As far as NGOs are concerned, three respondents contacted different NGOs; however, they did not get support in any form.

As discussed in chapter two, incentive scheme by the Ethiopian Science and Technology Ministry provides Local Research Grant and National Award for Best Achievement in Science and Technology to researchers or inventors in the private and public sectors based on the merit of the proposed research and innovative work. Since utility model certification is not used as a criterion by the Ministry only one respondent won the prize. Besides, one respondent was selected as a winner for the year 2001 but the Ministry cancelled 2001 year award. Currently, the awards completely go to best students and teachers in science and technology.

As far as the Ethiopian Inventors Association is concerned, it was initiated and established by few inventors with objectives: to encourage creative thinking and the spirit of inventions, to promote and enhance the development and utilization of invention, and to provide advice and guidance to inventors in their work. However, the association is very weak. It does not have the necessary facilities as well as resources to meaningfully contribute to the administration and promotion of intellectual property in the country in general and in Addis Ababa in particular. Currently, the association does not have even permanent or part time employees. Consequently,

the office which is located at Productivity Improvement Center around Lideta however closed for long period. As a result almost all respondents did not receive support in any form. Only two respondents indicated that they received support from the association in the form of money and advice. The remaining significant number of respondents did not aware of its existence.

As indicated in chapter two, one of the power and duties of EIPO is to facilitate the establishment of support and strengthening of inventors, authors and musician associations as well as similar societies. As key informants' discussion, however, the office support to the association is negligible since there is a shortage of budget and turn over of leaders at the office. By strengthening the association, EIPO would discharge its responsibility and assist inventors' to interact among themselves and share experience on research and development as well as on how to commercialize their inventions. Moreover, MoST powers and duties in assist and encourage the establishments of association that contribute to the development of science, technology and innovation did not implement particular to EIA.

Table 4.11 Some of the Support Institutions and Their Supports

Some of the Support Institutions	**Support Requested**	**Number of Enterprises Who Requested support**	**Results**	
			Granted	**Not granted**
Kebele/sub city administrations	Land/low renting house	7	4	3 (on process)
Enterprise Ethiopia (now Ethiopian Centre for Competitiveness)	Competition for fund	2	1	1
Different NGOs	Fund	3	0	3
Productivity Improvement Centre	Technical	1	0	1
Total		**13**	**5**	**8**

Source: Field Survey, 2010

4.6 Organization Resource and Competency

Organizational resources are the financial, physical, human, technological, and organizational endowments that allow a company to create value for the customers. In this section, tangible and intangible resources of business establishments will be discussed using five points scale (i.e1=strongly agree, 2= agree, 3= neutral, 4=disagree and 5= strongly disagree) as depicted below.

Financial resources and physical assets act as the life blood of new venture. As shown in Table 4.12, to all business establishments the majority of respondents replied neutral about for their adequacy of physical resources. This implies that they have satisfactory physical resources. However, in the dichotomous type of questions for their adequacy of storage facilities, 85 % inventors who established business enterprise stated that it was inadequate. As seen from the same table, their financial resources are also not adequate. As discussed earlier, these two are the major constraints for those inventors who did not establish business and they are also the major constrain for those inventors who established business. For instance, as indicated in Table 4. 8, their average production efficiency is 26.69%. This implies that their production system is extremely under capacity. Consequently, it decreases the likelihood of commercial success by increasing cost of production and decreasing quality of products.

Intangible resources are non-physical entities including brand name and intellectual property. As described earlier, intellectual property rights can facilitate the development of new products and protect them from new competitor's imitation while brand names are helpful for new venture to promote their new products by establishing positions in geographical space as quickly as possible. Regarding the question on popularity of brand name, the collected data shows the inconclusiveness since almost equal numbers of respondents indicated all options. As far as knowledge to prevent the invented products from imitation is concerned, most of respondents did not have sound mechanisms to prevent their invented products from imitation. This implies other individuals or businesses can easily imitate their invention and can lower their competitive advantage. This could be worsening since there are lacks of effective legal enforcement mechanism for the imitation of protected minor inventions. All these imply business enterprise established based on protected minor invention could not gain competitive advantage over their

competitors by reducing costs, improving quality, absorbing new technologies, and thus improve their performance (Chen, 2007).

In light of this reasoning, three questions were asked. Majority (11 or 84.61%) of respondents agreed to the positive statement regarding competence to launch the product to the market in a timely manner. With regard to technical competence to acquire the technologies to improve products, majority (10 or 76.92%) of respondents agreed to the positive statement. Concerning to competence to integrate the technologies to improve products, most of respondents (9 or 69.23%) are agreed. The responses to all of these three questions imply the importance of assembling and deploying strong capabilities to introduce products to the market in a timely manner, competency to improve products and ways of producing products, thus leading to a more satisfied outcome for the new venture.

Table 4.12 Business Resource and Competence (N=13)

Description	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Adequacy of physical resource	0	0	9	1	3
Adequacy of financial resource	0	0	4	3	6
Know how to prevent product from imitation	1	2	4	3	3
Popularity of brand	4	3	2	1	3
Competence to launch the product to the market in a timely manner	6	5	1	0	1
Technical competence to acquire the technologies to improve products	6	4	1	1	1
Competence to integrate the technologies to improve products	5	4	2	1	1

Source: Field Survey, 2010

as buyer for the business products. This implies that government role in stimulating locally invented products is negligible. By acting as a launch customer, the government need to provide manufacturers with the early revenues; scale economies, experience, and user feedback they need to improve their products and make them affordable for commercial users. Early government use may also demonstrate the performance of these businesses for potential commercial users, stimulating future demand.

Table 4.14 Outlets and Types of Customers

Types of outlets and customers	**Response**	**Frequency**	**Percent**
Type of outlets	Production site	7	53.84
	Business owned outlets	1	7.69
	Door to door selling	4	30.76
	Intermediaries	1	7.69
	Total	13	**100**
Types of customers	Individual consumers	5	38.46
	Intermediaries	1	7.69
	Private business	6	46.15
	Government	1	7.69
	Total	**13**	**100**

Source: Field Survey, 2010

Key informants from MoST were asked about the implementation of the 1993 national science and technology policy. The result of discussion identified major directions of the present national science and technology policy and the attempts to implement it are focused mainly on the supply measures of scientific and technological knowledge generation with inadequate attention to innovative activities at firm level and had not recognized the role of business enterprise, particularly SMEs. To fill this gap the government of Ethiopia is taking measure to formulate effective system to encourage and support technology transfer, creation, development and exploitation of intellectual property. One of the steps taken is revising the 1993 national science and technology policy. The revision of the policy should therefore take into consideration all the

stakeholders of the national system of innovation and pay adequate attention to the demand side interventions including the use of the government purchasing power and competitive incentives to create, develop and exploit of locally invented products (Oyelaran-Oyeyinka, 2006).

4.7.2 Marketing Promotion, Sales and Profit

Success of invention could be manifested in different forms. At the firm level, it is usually measured in term of rising market share, productivity growth, or profitability (Palmberg, 2006). The overall profitability of an innovation is largely determined by the size and nature of potential markets. These markets should be communicated about the availability and benefits of locally invented products using appropriate media. With this regard, respondents were asked about their promotional practices. All of those who established business promoted their products using variety of media. As Table 14.15 indicated, most of business establishments used words of mouth to promote invented products followed by trade fair and exhibitions organized by Addis Ababa Micro and Small Enterprise Development Bureau, and EIPO. At this point, it is important to mention that government and private owned media had involved in promoting locally invented products for the public freely.

Table 4.15 Promotion Media

Types of Media	Frequency	Percent
Words of mouth	5	38.46
Trade fairs and shows	3	23. 07
Television	1	7.69
Flyers	1	7.69
Publicity(newspapers, radios, television)	3	23.07
Total	**13**	**100.00**

Source: Field Survey, 2010

Besides, the mass media, newspapers, radio and television had tried its role to promote public awareness about of inventions and its role on economic development and personal wealth. They also publicized success stories of inventors so as to spur further interest on inventions and to create model to follow. Hopefully, the mass media would treat the above as a regular activity and integrate it into their corporate program.

To measure the success of inventions in terms of profitability, respondents were also asked about their number of customers, volume of sales and profitability. The respondents in the sample survey indicated that there are growths in terms of number of customers, sales volume and profit over the last three years. As indicate in Table 4.16, 53.84 % of the respondents said their profit has increased while 23.07 % of them replied their profit remained the same. The remaining indicated that their profit has declined and not known. Besides, respondents were also asked about why customers buy their products. Survey results shows that majority of them replied their products are low price and high quality. These are source of success in new products commercialization (Zahra and Nielsen, 2002). Consumers demand and buy new products and industries require better and more efficient equipment to keep up with domestic and international competition.

Table 4.16 Number of customers and sales/profit (N=13)

Description	Increasing	Continues on the same	Declining	I don't Know
Numbers of customers	9	3	1	0
Sales volume	6	2	2	3
Profit	7	3	2	1

Source: Field Survey, 2010

4.7.3. Commercialization Success

Many factors enter into a firm's decision to commercialize an invention. An invention cannot be successfully commercialized without adequate manufacturing capacity and skill, suitable marketing and distribution channels, and after-sales support.

Among the options to commercialize inventions, starting own manufacturing by minor inventor is the most common practice observed in the study. As discussed earlier, only 13 individuals started their business for legally protected minor inventions. As indicated earlier commercialization success at firm level measured in terms of rising market share, productivity growth or profitability. However, this study was made an effort to identify whether they succeed or not considering profitability of the new venture. Almost half of the respondents who established business indicated that they succeed for their minor invention commercialization effort. The remaining did not successful. Further for those who replied about their unsuccessfulness story of their commercialization effort, were also asked the obstacles. As indicated in Table 4.16, almost half of respondents who did not successful in commercialization of minor invented products stated that the lack of sales location and shortage of finances and resistance attitudes by potential customers are the major obstacles for them.

Table 4.17 Obstacles for Commercial Success

Obstacles for Commercial Success	**Frequency**	**Percent**
Lack of sales locations	3	42.85
Shortage of finances	2	28.57
Resistance attitudes by potential customers	2	28.57
Total	**7**	**100.00**

Source: Field Survey, 2010

Besides, they were also asked what measure taken to enhance the commercialization success. From Table 4.17, one can see that almost half of them looked partnership and support as mechanisms to enhance commercialize success. However, their attempts did not get positive response. Among supports requested organization/institutions and support areas requested include kebele/sub city administrations for sale locations. All of their efforts did not lead satisfactory result. In addition, none of them tried to sale their utility model although willing to sell their utility model. Of course, those who invented minor or incremental products and establish businesses are highly responsible for their inventions commercialization, other stakeholders as well. For instance in Arnold and Kuhlman (2001) generic national innovation system, industrial system is one component that can enhance the commercialization of minor

invention by buying IPRs and then producing products for sell. Besides, EIPO is the one expected to play its role to commercialize locally invented products since one of the power and duties of the office according to Proc No. 320/2003 Art 6 sub Art 15 is to facilitate conditions that will help to create linkage between intellectual property owners and entrepreneurs who wish to exploit their creative works. Besides, the office is also responsible for follow up the exploitation of legally protected invention (Proc No. 320/2003 Art 6). If the office facilitates conditions, there will be satisfactory result since all of respondents who did not successful in their commercialization effort due to lack of sales location , shortage of finances and resistance attitudes by potential customers are willing to sale their IPRs.

Table 4.18 Measure Taken to Enhance Commercialization Success

Measure Taken to Enhance Commercialization	**Response**	**Frequency**	**Percent**
Searched partners	Yes	3	42.57
	No	4	57.43
	Total	**7**	**100**
Looked for support	Yes	5	71.42
	No	2	28.58
	Total	**7**	**100**
Tried to sell utility model	Yes	0	00
	No	7	100
	Total	7	100
Willingness to sell utility model	Yes	6	85.71
	No	1	14.29
	Total	**7**	**100.00**

Source: Field Survey, 2010

Chapter Five

Summary, Conclusions and Recommendations

This final chapter of the study has two sections. First, summary and conclusions are highlighted. Second, recommendations are put in order based on the analysis and finding of the study.

5.1 Summary and Conclusion

The study aimed to explore and examine factors and issues of local minor invention commercialization in Addis Ababa. Appropriate methods and tools of data collection and analysis were combined and employed to achieve the study objectives. In this regards, pertinent policy and legal documents as well as related literatures were reviewed to generate data that complemented the information obtained from primary source including minor inventors and key informants. The data were collected directly from structured and semi- structured questionnaires, key informants discussion and researcher observation. Based on the analysis of finding as well as in light of the objective and scope of the study, the major finding and conclusions summarized as follows.

- The total number of respondents covered in this study is 43 minor inventors. The most powerful motivations for minor invention are sense of achievement (39.5%), to solve societal problems (30.2%) and to own business (9.3%). Moreover, only 13 of them out of 43 established business based on their legally protected intellectual right. Almost all business establishments are SMEs. In addition, most of the business establishments preferred sole proprietorship form of business ownership and the starting capital came from owners own saving. Since Credit service is near absent as seed capital and seems to be catering relatively well on the growth phase rather than the start up phase. About half of those who established business did not succeed in commercialization activities. The most cited obstacles for commercial success are shortage of sales locations, lack of financial support and resistance attitude by potential customers.

- Those who did not establish business (i.e. 30) to commercialize their legally protected minor invention mentioned shortage of finance, lack of working premise and lack of the required experience as the major constraints to commercialize minor inventions. In

alleviating these constraints, they looked for other options such as searching partners (43%), looking support (70%) and trying to sell utility model (27%). However, their effort to commercialize failed due to lack of private/government partners, lack of integration and coordination among the institutions, and lack of orientation about intellectual property rights and its benefits.

- Improvement is witnessed in the development of legal and institutional framework for the protection of intellectual property in Ethiopia since last decade. Furthermore, there are encouraging developments in the use of system to protect intellectual property in general and minor invention protection in particular and generating new ones. The majority of applicants' were informed about utility model by their relatives and applied for legal protection purpose. However, its importance for those who established business enterprises is open to doubt merely for inadequacy of enforcement of laws.

- Available support institutions for minor inventors include: family and relatives, kebele/sub city administrations, Ethiopian Intellectual Property Office, the then Enterprise Ethiopia (now Ethiopian Centre for Competitiveness), Ministry of Energy and Mineral, NGOs and Productivity Improvement Centre, Ministry of Science and Technology and Ethiopian Inventors Association.

- Lack of a strong support innovations system and institutional arrangement has created a vacuum in the commercialization of locally invented products and impeding the potential of actors to meaningfully contribute to create an enabling environment for creation, development and exploitation of intellectual property in general and utility model in particular. The role of government in buying/using or creating linkage for product market is negligible and intermediaries' involvement in distributing products is minimal as well. In addition, pervasive capacity gap observed among components of innovation coupled with problem of perception that commercialization is the sole responsibility of the inventors deter efforts to advance cooperation among stakeholders to create, development and exploitation of IP assets.

5.2 Recommendations

In light of the study findings and conclusions, the following recommendations are forwarded.

- MoST and/or EIPO need to prepare consortium, seminar, workshops, and meetings. Such meeting are an excellent opportunity for the exchange of ideas, experience and contacts between inventors, researchers, and managers and other professional groups and development institution involved in inventive and innovation activities, namely governmental authority , research and development institutions, industries, businesses, universities, relevant associations (for instance Ethiopian Inventors Association and Chamber of Commerce) at least once every year(probably at world intellectual day(April,26) or at the end of the budget year)

- On top of this, EIPO should create linkage with other public bodies such as finance and tax authority and institutions whose responsibilities affect IP assets development, protection and exploitation. Alongside, the office should also maintain contact and develop cooperation with other federal and regional institutions. It is also advisable to maintain and promote a webpage on EIPO IP issues as a tool for better communication with stakeholders countrywide. In addition, the office should classify minor inventions by sub-sectors, regions and years so that further research can be made. Moreover, EIPO should strengthen its capacity in terms of man powers; facilities and budget to enable it to provide competitive legal and technical support service and play a leading role in the protection and promotion of the exploitation on intellectual property assets in the county.

- In addition, EIPO recommended to create a commercialization department/unit with sufficient fund or commercialization fund to address key commercialization challenges and expand program that support seed and start-up firms to exploit intellectual property by themselves or to use other options of commercialization (licensing and transferring IPR) before protection periods expires

- Further, MoST and/or EIPO must refine and enhance how to support commercialization and innovation infrastructure making it more adaptable and flexible to allow the private sector, government, academic institution and other group to be better able to react to changing condition, moving aggressively and seizing new opportunities. By providing effective incentives at least to potentially viable minor invention and creating an institutional environment that encourages entrepreneurship, innovation rewards, and fosters start-ups. MoST and/or EIPO need to devise effective mechanisms to creating links between knowledge generation and enterprise development.

- On the other hand, minor inventors/business enterprises (utility model holders) should be aware of the policy, the rule and regulation of IPR in Ethiopia. Besides, they should be strengthening their association and demand support from MoST/EIPO and request support from WIPO and International Federation of Inventors' Association (IFIA). For the inventors themselves, the creation of active inventors' association means pooling their own resources together so that their needs and requirements can be better represented. They can also interact among themselves and share experience on research and development as well as on how to commercialize their inventions.

- In addition, local minor inventors should recognize about their invention from the following earmarks: their invention should be market driven, functional, capable of being produced and economical, and can be launched quickly. This will have an important implication for selling their IPRs and enhance the commercialization of minor inventions.

- Finally, to achieve all these, government, businesses community, educational and research community, inventors, relevant associations must work together unlike previous experiences, united in a common cause to define Ethiopia as one innovation country with products, service and process that can compete and win in global markets.

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Annex I: Questionnaire Designed for the Survey

Addis Ababa University

College of Development Studies

Institute of Regional and Local Development Studies

Research Questionnaire

Dear respondent:

The purpose of this questionnaire is to gather pertinent and relevant data that will be used as an input to conduct educational research at master's level which is entitled *"Factors and Issues of Local Minor Invention Commercialization in Addis Ababa"*. Hence, your genuine responses and cooperation is highly valuable to get the necessary data. Your responses are confidential and only used by the researcher to pursue the intended research. Thank you in advance for your willingness.

Part 1: Background of Local Minor Inventor (Utility Model Holders)

1. Sex of the respondent: 1. Male ☐ 2. Female ☐
2. Age of the respondent: _____
3. Marital status of the respondent: 1. Single ☐ 2. Married ☐ 3. Divorced ☐ 4. Widowed ☐ 5. Separated ☐
4. Educational background of the respondent:
   1. Illiterate ☐
   2. Read and write ☐
   3. Elementary school (Grade 1-4) ☐
   4. Junior secondary school (Grade 5-8) ☐
   5. Senior secondary school (Grade 9-10) ☐
   6. Preparatory school (Grade 11 and 12)
   7. TVET graduate ☐
   8. First Degree ☐
   9. Masters ☐
   10. Others (specify) _____
5. Do you have occupation before invention? 1. Yes ☐ 2. No ☐ **(If no skip to 8)**
6. If your response for Q 5 'yes' what was your occupation?_____
7. Did the experience significantly contributed to your invention? 1. Yes ☐ 2. No ☐
8. Is there a tradition in your family to run own business? 1. Yes ☐ 2. No ☐

Part II: Minor Invention and Utility Model Certification

9. Which was the most powerful motive for you to invent?
   1. To gain prestige ☐ 2. Sense of achievement ☐ 3. To owned business ☐
   4. Curiosity ☐ 5. To solve societal problem ☐ 6. Other (specify)_____
10. Did you conduct research (scanned the environment) on the needs and wants of potential buyers before inventing? 1. Yes ☐ 2. No ☐
11. If your response for Q 10 is 'yes' was it feasible? 1. Yes ☐ 2. No ☐

12. Did you get any encouragement at the time of inventing from your close social group?

1. Yes ☐ 2. No ☐

13. If your response for Q 12 is 'yes' who? Tick more than one if necessary.

1. Wife/husband ☐ 2. Parent's ☐ 3.Friends/relatives ☐

4. Other (Specify) _____

14. When was the minor invention created? _____(Ethiopian calendar)

15. When did you applying for utility model certification for your minor invention? _____ (Ethiopian calendar)

16. What was the main purpose of applying for utility model certification?

1. Legal protection ☐ 2. To reserve right ☐ 3. To gain support ☐

4. Recognition ☐ 5. Other (specify)_____

17. How long did it take you to set the certificate after you applied?

1. Less than three months ☐ 4. Ten months to twelve months ☐

2. Three months to six months ☐ 5. More than twelve ☐

3. Seven months to nine months ☐

18. If your response for Q 17 is 'more than six months', what was the main reason?

1. Lack of money to pay fees for certification ☐ 3. Excessive procedures ☐

2. Lack of information about the requirements ☐ 4.Other (specify_____

19. What was your source(s) of information about utility model and its benefits? (Multiple answers possible)

1. News papers ☐ 2. Radio ☐ 3. Television ☐ 4. Friends/relatives ☐

5. Others (Specify)_____

Part III: Current Condition of Minor Inventor

20. Have you established business to produce products based on your minor inventions for sale?

1. Yes ☐ 2. No ☐ **(If your response is 'yes' skip to Part IV)**

21. If you response for Q 20 is 'no', why? Rank the three major reasons.

Factors	Rank
Excessive procedure to obtain authorization	
Lack of skilled manpower	
Shortage of finance	
Fear of competition	
Lack of experience	
Estimated high cost of production	
Lack of knowledge of market	
Uncertainties related to demand for products	
Shortage of land	
Other(Specify) _____	

22. What measure have you taken to solve the above problems? Yes No

1. Have searched partner(s) ☐ ☐
2. Have looked for support ☐ ☐
3. Have tried to sale right of minor invention ☐ ☐
4. Other (Specify)_____ ☐ ☐

23. If your response for Q 22(1) is 'yes' what was the result?

1. Not found ☐ 2. Found but not agreed ☐
3. Found and agreed but not trusted each other ☐ 4. On the process ☐
5. Other (Specify)_____

24. If your response for Q22 (2) is 'yes' where and what were the results?

Institutions	Support requested areas	Results
☐Kebele administration		
☐Sub city administration		
☐Addis Ababa City Administrations		
☐Enterprise Ethiopia		
☐Ethiopian Intellectual Property Office		
☐Ministry of Science and Technology		
☐Federal Micro/Small Business Development Agency		
☐Ethiopian Inventors Association		
☐Productivity Improvement Centre		
☐Quality and Standard Authority of Ethiopia		
☐Microfinance institution(Specify)_____		
☐ Banks(Specify)_____		
☐Other(Specify)_____		

25. Are you willing to sale the right of utility model before lapsed its duration? Yes ☐ 2. No ☐

26. Are you currently salaried or self employed? Yes ☐ 2. No ☐

27. What three priority measure do you suggest to improve commercialization of local invention?

1._____
2. ._____
3. ._____

Part IV: General Characteristics of Business

28. Forms of business ownership: 1. Sole proprietorship ☐ 2. Partnership ☐
3. Private Limited Company (PLC) 4. Corporation ☐
5. Other (specify)_____

29. Kind/sector of the business: _____

30 What is the size (m^2) of land you owned for the business?_____

31. How did you acquire the building/ premise on which you started this business?

1. Leased ☐ 2. Rented it from individual ☐ 3. Rented it from kebele ☐

4. Bought ☐ 5. Others (specify) _____

32. Which was the most powerful motive for you to go in your own business based on your invention?

1. Social satisfaction ☐ 2. Sense of independence ☐ 3. Maximizing Profit. ☐

5. Sense of achievement ☐ 6. Previous job dissatisfaction ☐

7. Other (specify)_____

33. When was the business established? _____(Ethiopian calendar)

34. How much was the starting capital of the business? _____(Ethiopian Birr)

35. What was source of capital for your business? (Multiple responses possible)

1. Own saving ☐ 2. Loan from friends/ relatives ☐

3. Family help ☐ 4. Loan from saving and credit association ☐

5. From 'Iqqub' ☐ 6. Others (specify) _____

36. Do you business have a defined organizational structure? 1. Yes ☐ 2. No ☐

37. How many employees you have employed? Male _____ Female_____

38. The highest employees level of education for your key business functions?_____

39. Total number of employees for response Q 38: Male _____ Female_____

40. Your firm own adequate physical assets for operating the business:

1=Strongly agree ☐ 2= Agree ☐ 3= Neutral ☐

4=Disagree ☐ 5= Strongly disagree ☐

41. Your firm possessed popular brand name(s) in the market:

1=Strongly agree ☐ 2= Agree ☐ 3= Neutral ☐

4=Disagree ☐ 5= Strongly disagree ☐

42. Your firm possessed know-how to prevent the products from imitation:

1=Strongly agree ☐ 2= Agree ☐ 3= Neutral ☐

4=Disagree ☐ 5= Strongly disagree ☐

43. Your firm owned adequate financial assets for operating the business:?

1=Strongly agree ☐ 2= Agree ☐ 3= Neutral ☐

4=Disagree ☐ 5= Strongly disagree ☐

44. If your response for Q 43 is 'strongly disagree' or 'disagree' in which area did cash shortage limit your operations?

1. To buy inputs ☐ 2. Promotion ☐ 3. Large scale production ☐

4. Distribution ☐ 5. To improve the invented products ☐

7. Other (specify)_____

45. Are the following tasks performed in your business?

	Yes	No
Bookkeeping	☐	☐
Cost calculation before production	☐	☐
Marketing-Promotion	☐	☐
Periodic financial review	☐	☐
Forecasting of demand	☐	☐
Employee training	☐	☐
Profitability analysis	☐	☐
Quality control	☐	☐
Continuous improvement of products	☐	☐

46. Do you have defined plan to expand your business in the next three year? 1. Yes☐ 2. No ☐

Part V: Institutional Factors

47. Have you ever taken credit? 1. Yes ☐ 2. No ☐

48. If your response for Q 47 'yes', rank major three source of credit.

Source of credit	Rank
Family	
Relatives	
Informal sources :'Iqqub',' Ider'	
Micro finance institutions	
Banks	
Other(specify)_____	

49. If you have taken credit from micro finance institutions, was it easily accessible?

1. Yes ☐ 2. No ☐ **(If 'yes' skip to 50)**

50. If your response to Q 49 is 'no', what were the three most important problems; rank.

Reason(s)	Rank
Short repayment period	
Lengthy bureaucracy	
High collateral requirement	
High interest rate	
Small amount(Principal)	
Other, specify _____	

51. If you have taken credit from banks, was it easily accessible?

1. Yes ☐ 2. No ☐ **(If yes skip to 53)**

52. If your response to Q 51 is 'no', why? Rank the three most reasons.

Reason(s)	Rank
Short repayment period	
Lengthy bureaucracy	
High collateral requirement	
High interest rate	
Small amount(Principal)	
Other, specify _____	

53. Have you received support from any institution so far? 1. Yes ☐ 2. No ☐

(If 'no' skip go to Q 55)

54. If your response to Q 53 'yes' where and support areas?

Support Institutions	**Support types/ areas**
☐Kebele administration	
☐Sub city administration	
☐Addis Ababa City Administrations	
☐Enterprise Ethiopia	
☐Ethiopian Intellectual Property Office	
☐Ministry of Science and Technology	
☐Federal Micro/Small Business Development Agency	
☐Ethiopian Inventors Association	
☐Productivity Improvement Centre	
☐Quality and Standard Authority of Ethiopia	
☐Other(Specify)_____	

55. Did the support significantly improve your business commercialization activities?

1. Yes ☐ 2. No ☐

56. If your response for Q 55 is no, why? _____

57. Do support providers deal with you before providing the support in order to investigate your needs? 1. Yes ☐ 2. No ☐

58. Have you improved techniques/technologies since started production? 1. Yes ☐ 2. No ☐

Part VI: Production

59. Quantity of products, on average, does your business produce daily/weekly/monthly/yearly? ___

60. Maximum capacity of production per day/weekly/month/year?_____

61. If you are not producing to the business capacity why? Rank major three.

Factors	Rank
Lack of capital	
Inappropriate production location	
Poor market linkage	
Lack of production space	
Lack of training towards business management	
Lack skilled manpower	
High production cost	
Others (specify) _____	

62. Do you have adequate storage facilities? 1. Yes ☐ 2. No ☐

63. Your firm produced the ordered product mostly on time:

1=Strongly agree ☐ 2= Agree ☐ 3= Neutral ☐

4=Disagree ☐ 5= Strongly disagree ☐

64. Your firm possessed financial competence to acquire the technologies to improve existing products:

1=Strongly agree ☐ 2= Agree ☐ 3= Neutral ☐

4=Disagree ☐ 5= Strongly disagree ☐

65. Your firm possessed technical competence to acquire the technologies to improve existing products:

1=Strongly agree ☐ 2= Agree ☐ 3= Neutral ☐

4=Disagree ☐ 5= Strongly disagree ☐

66. Your firm possessed the competence to integrate the technologies to improve existing products:

1=Strongly agree ☐ 2= Agree ☐ 3= Neutral ☐

4=Disagree ☐ 5= Strongly disagree ☐

Part VII: Commercialization

67. How many units on average does your business sell daily/weekly/monthly/yearly? _____

68. Is there growth in your business operation? 1. Yes ☐ 2. No ☐

69. If your response for Q 68 is 'yes' in terms of what?

	Yes	No
Opening new production/ operation site	☐	☐
Increasing production/ operation capacity of an existing system	☐	☐

70. How do you describe the responsiveness of your business to the existing opportunities?

1. Highly responsive ☐ 2. Responsive ☐ 3. Less responsive ☐ 4. Unresponsive ☐

71. Is there any threat that can affect the sustainability of your business production? 1. Yes ☐ 2. No ☐

72. If your answer to Q 71 is "yes" please list the most important threats in their order of sensitivity:

1st _____ ,2nd _____

73. Where do you sell your product?

1. Production site ☐ 2. Business owned outlets ☐ 3. Door to door selling ☐
4. Consignment sales ☐ 5. Rented outlets ☐ 6. Other (specify)_____

74. Who are your major customers?

1. Consumers ☐ 2. Government business enterprise ☐ 3. Government public
4. Traders ☐ 5. Other private business ☐ 6. Institutions ☐
7. Others (specify)_____

75. Have the numbers of customers over the last three years:

1. Increasing at increasing rate ☐ 4. Declining ☐
2. Increasing at a decreasing rate ☐ 5. I don't know ☐
3. Continues on the same rate ☐

76. Your firm possessed the competence to launch the product to the market in a timely manner:

1=Strongly agree ☐ 2= Agree ☐ 3= Neutral ☐
4=Disagree ☐ 5= Strongly disagree ☐

77. Do you know why customers buy products from your business? 1. Yes ☐ 2. No ☐

78. If your response for Q 77 is 'yes' what is the most powerful reason?

1. Low cost ☐ 2. High product quality ☐ 3. Guarantee ☐
4. Maintenance service ☐ 5. Other (Specify)_____

79. How do you rate the performance of your business in terms of sales volume?

1. Increasing at increasing rate ☐ 4. Declining ☐
2. Increasing at a decreasing rate ☐ 5. I don't know ☐
3. Continues on the same rate ☐

80. Does your business diversify to related business activity (sector)? 1. Yes ☐ 2. No ☐

81. Does your business diversify to unrelated business activity (sector)? 1. Yes ☐ 2. No ☐

82. What sorts of opportunities currently exist in your business environment?

	Yes	No
1. The presence of large market	☐	☐
2. Policy support provided by government/government agencies	☐	☐
3. Provision of credit services by micro financing institutions	☐	☐
4. Provision of credit services by commercial banks	☐	☐
5. Others (specify) _____	☐	☐

83. How do you rate the performance of your business in terms of profit?

1. Increasing at increasing rate ☐ 4. Declining ☐
2. Increasing at a decreasing rate ☐ 5. I don't know ☐
3. Continues on the same rate ☐

84. If your answer to Q 83is 'increasing at increasing rate' what could be the deriving factor(s) to it?

Deriving factor(s)	Rank(major three)
1. Prevalence of high market demand	
2. Lack of competition	
3. Provision of quality products/ services to the market	
4. Provision of products/ services at a lower price than competitors	
5. Strong marketing effort	
6. Strong marketing linkage	
7. Protection of illegal imitation	
7. Others (specify) _____	

85. How do you rate your level of satisfaction with the return of your invention?

1. Completely satisfaction ☐ 2 Very satisfied ☐ 3. Fairly well satisfied ☐
4. Somewhat dissatisfied ☐ 5.Very dissatisfied ☐

86. Have you ever promoted products? 1. Yes☐ 2. No ☐

87. If your response for Q no. 86 is 'yes', what are the major three methods/tools used?

Methods of promotion	Rank(Major three)
Words of mouth	
Personal selling	
Sale promotions- incentives	
Trade fairs and shows	
Radio	
Television	
Newspaper	
Magazine	
Other (Specify)_____	

88. What is the current capita of the business? _____

89. Utility model certification for your business success:

1. Critical importance☐ 2. Very importance ☐ 3. Somewhat importance☐
4. Little importance ☐ 5. Not at all importance☐

90. Does your business commercially succeed for invented product? 1. Yes ☐ 2. No ☐

91. If your response for Q 90 is 'no' what are the obstacles to commercial success?

Constraints to commercialize	Rank
Shortage of sales locations	
Lack of skilled sales persons	
Shortage of finance	
Resistant attitudes by potential customers	
Lack of experience	
Lack of knowledge of market	
Weak distributions system	
Lack of market standards/regulations	
Other(Specify) _____	

92. What measure have you taken to solve the above problems? Yes No

1. Have searched partner(s) ☐ ☐
2. Have looked for support ☐ ☐
3. Have tried to sale right of minor invention ☐ ☐
4. Other (Specify)_____ ☐ ☐

93. If your response for Q 91(1) is 'yes' what was the result?

1. Not found ☐ 2. Found but not agreed ☐
3. Found and agreed but not trusted each other ☐ 4. On the process ☐
5. Other (Specify)_____

94. If your response for Q91 (2) is 'yes' where and what were the results?

Institutions	Support requested areas	Results
☐Kebele administration		
☐Sub city administration		
☐Addis Ababa City Administrations		
☐Ethiopian Intellectual Property Office		
☐Ministry of Science and Technology		
☐Federal Micro/Small Business Development Agency		
☐Ethiopian Inventors Association		
☐Quality and Standard Authority of Ethiopia		
☐Other(Specify)_____		

95. Are you willing to sale the right of utility model before lapsed its duration? Yes ☐ 2. No ☐

96. What three priority measure do you suggest for commercial success of local minor invention?

1._____
2. ._____
3. ._____

Thank You

Annex II: Interview Guideline for Key Informant (EIPO)

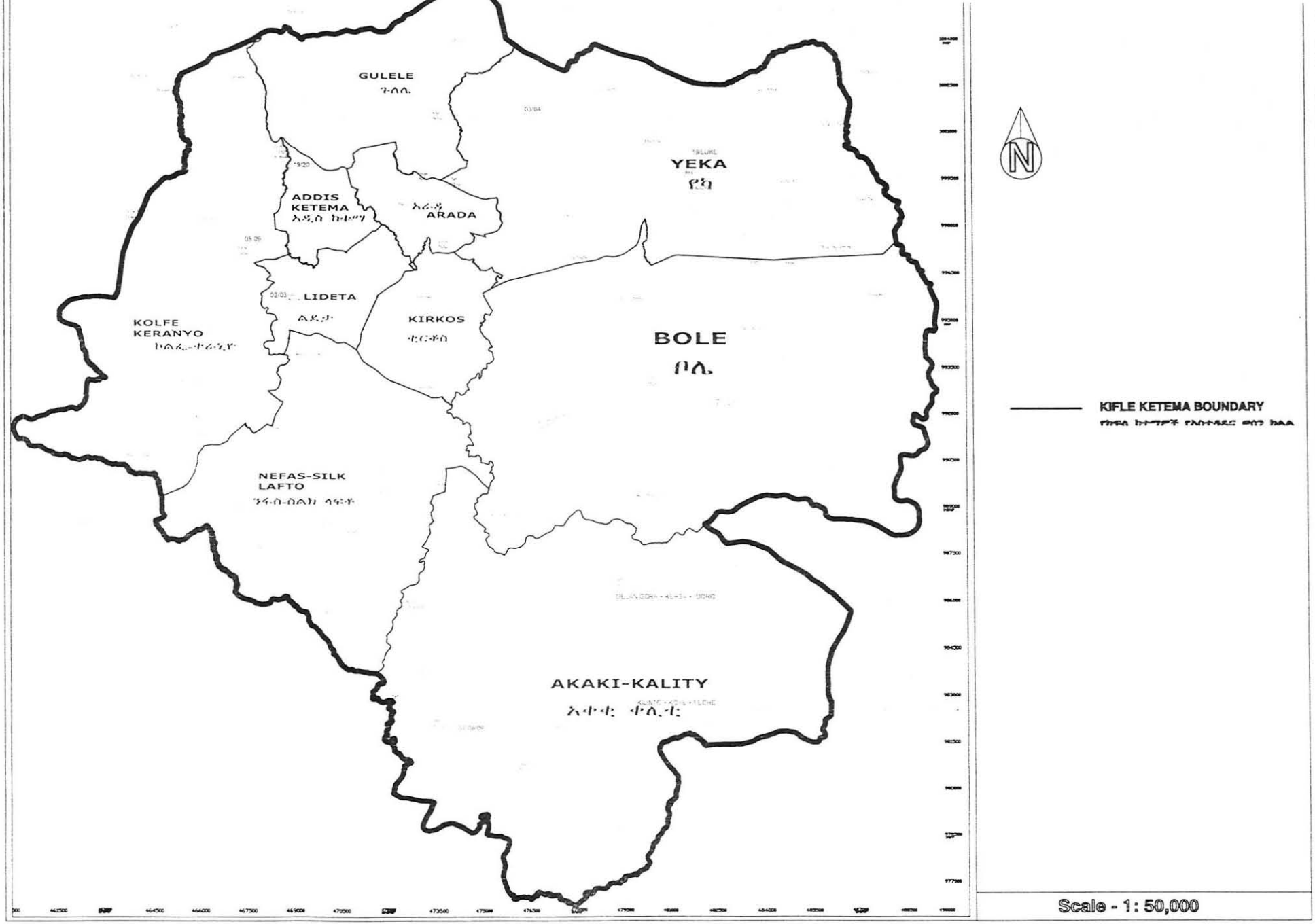
1. How do you explain the situation of minor inventors in Ethiopia?
2. What are the main challenges of minor inventors to register for utility model certification?
3. Does EIPO institutionally capable to discharge its powers and duties?
4. How EIPO promote IP creation, development and exploitation?
5. What are the assistances provided by EIPO to enhance commercialization of minor inventors?
6. Is there strong relationship between the office and EIA? If no why?
7. Is there strong relationship between the office and other relevant organization/institutions for IP creation, development and exploitation? If no why?
8. Are there any opportunities created by EIPO to minor inventors to enhance their invention commercialization?
9. What change and improvement in the policy domain are needed to enhance minor invention commercialization?

Annex III: Interview Guideline for Key Informant (MoST)

1. Does MoST institutionally capable to discharge its powers and duties?
2. How MoST encourage the practical application of local minor inventions?
3. How MoST assist and encourage the establishment of association particularly EIA that contribute to the development of science, technology and innovation?
4. What are the criteria for granting awards and incentive to individuals and institutions that have contributed to the development of science, technology and innovation?
5. What are the assistances provided by MoST to enhance commercialization of minor inventors?
6. Is there strong relationship between the minister and other relevant organization/institutions for IP creation, development and exploitation? If no why?
7. Are there any opportunities created by MoST to minor inventors to enhance their minor invention commercialization?
8. What change and improvement in the policy domain are needed to enhance minor invention commercialization?

Annex IV: Interview Guideline for Key Informant (EIA)

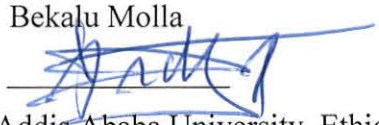
1. How EIA is organized? What are the criteria to be included in the association?
2. What are the main purpose of EIA and source of finance?
3. How do you explain the current condition of EIA?
4. What form does the collaborative working culture take in the association? Relationship between members in the associations, member's attitude toward responsibility sharing and commitment?
5. How the association assists minor inventors?
6. What are the major challenges faces in operating this association?
7. Does EIA institutionally capable to fulfill its purpose?
8. How EIA promote IP creation, development and exploitation?
9. Is there strong relationship between the association and EIPO? If no why?
10. Is there strong relationship between the association and other relevant organization/institutions for IP creation, development and exploitation? If no why?
11. Are there any opportunities created by association to minor inventors to enhance their invention commercialization?
12. Do the government's polices and strategies support such initiatives, what is the practicability?



Source: Addis Ababa City Administration: Land Development and Urban Rehabilitation Project office

DECLARATION

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

Name	Bekalu Molla
Signature	
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