ADDIS ABABA UNIVERSITY

College of Business and Economics

Department of Public Administration and Development Management

The contribution of FDI firms for technology transfer in the case of "Bole Lemi Industry Park" and "Eastern Industry Zone"

BY: MULUALEM BARKLIGNE

October, 2018

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A Thesis is submitted to the department of public administration and development management of Addis Ababa University in Partial Fulfilment of the Requirements for the Degree of Master in Public Management and Policy (MPMP)

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This is to certify that the thesis prepared by Mulualem Barkligne entitled "**The contribution of FDI firms for technology transfer in the case of "Bole Lemi Industry Park" and "Eastern Industry Zone"**" which is submitted in partial fulfillment of the requirements for the degree of master's in public management and policy (MPMP), complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

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October, 2018

Addis Ababa

Declaration

I, the undersigned, hereby declare that this thesis work entitled, "**The contribution of FDI firms for technology transfer in the case of "Bole Lemi Industry Park" and "Eastern Industry Zone""** is the original work and it hasn't been presented for the award of any other Degree, Diploma and other titles of any other University or institution and that all source material used for the thesis has been duly acknowledged and hence adheres to the regulations of the university.

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The contribution of FDI firms for technology transfer in the case of "Bole Lemi Industry Park" and "Eastern Industry Zone"

By: MulalemBarkligne

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MulualemBarkligne

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List of Acronyms

FDI *Foreign Direct Investment*

EIC *Ethiopian Investment Commission*

IPDC *Industrial Parks Development Corporation*

IM *Industry Minister*

MNC *Multi-National Companies*

FDRE *Federal Democratic Republic of Ethiopia*

WB *World Bank*

UNDP *United Nations Development Program*

UNCTAD *United Nation Conference on Trade and Development*

NIS *National Innovation System*

LDC *Least Developed Countries*

R&D *Research and Development*

IPRS *Intellectual Property Rights*

IMF *International Monetary Fund*

MOFEC *Ministry of Finance & Economy Cooperation*

FOEs *Foreign Owned Enterprises*

DOEs *Domestic Owned Enterprises*

GDP *Gross Domestic Product*

IZ *Industry Zone*

IP *Industry Park*

Abstract

Transfer of technology is the key element of the industrialization, growth and economic development of the countries. The transfer of technology through foreign firms would be effective if and only if when there is a high level of local participation and if there is a clear policy and binding law in which these foreign firms in the industry park and zone will engage in the capacity building activity for local firms.

This study aims at exploring the level of linkage between foreign firms in the industry park and zone Vs local firms and how foreign firms in the industry park and zone engage in the technology capacity building activity of local firms and local personnel's directly or indirectly and also reviews the policies and laws in this specific topic.The quantitative and qualitative models have been significantly utilized in analyzing the contributing factors of technology transfer process.

The main focus of this study is to evaluate the level of contribution of foreign firms specific in industry zone and parks for technology transfer by considering the foreign firms technological level and potential for technology flow.Majority of these foreign firms in industry park and zone export their products for European & American market.So to satisfy the end product consumers' needs, these firms used modern machineries and technologies to produce standard product.

The conducted survey analysis shows that foreign firms found in industrial park & zone have a big potential for technology transfer for local firms and employees. But, it needs extra work to benefit from these firms as a means of least expensive technology transfer mechanism.

The designed policies and laws regarding technology transfer from these firms need to review to encourage the firms through incentives or pre-arrangedinvestment agreements. To address the problem, the researcher proposes policy implications by putting the contributing factors to effectively transfer technologies from FDI firms.

Keywords: ***Technology Transfer, Industry park, foreign firms.***

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

Foreign direct investment (FDI) is one of the primary engines of growth and development specially for developing countries' economies. Foreign Direct Investment (FDI) plays an important role as an engine of technological development, productivity enhancement, economic intensification, and more importantly, as an instrument of technology transfer.

Its effectiveness rests on strong complementarities with other elements in the growth process, most notably technological progress, skill acquisition and the development of innovative capacity. These elements make investment a natural departure for Governments seeking to formulate a robust development strategy. The link between investment and the other determinants of growth however is not an automatic process. It requires among other things a favorable macro policy environment and specific policies and institutions aimed at encouraging saving and attracting and directing investment to key sectors in the economy thereby enhancing the contributions of investment to skills formation, technological change, competitiveness and economic growth. A clear understanding of how such a link between investment policies on the one hand and technological progress on the other can be taken as an essential prerequisite for designing an effective national investment policy and investment promotion strategy.

Ethiopia implemented numerous macroeconomic reforms with the objective of achieving macroeconomic stabilization and growth since 1991. The macroeconomic reforms include privatization of state owned enterprises, liberalization of trade policy, reduction of import tariff rates, elimination of non-tariff barriers, devaluation and deregulation of price & exchange rate controls (UNCTAD, 2002). These reforms have also been implemented with the aim of attracting foreign direct investment to the ultimate goal of poverty reduction thereby enhancing a better standard of life. The contribution of FDI to the economy of one country will be effective

if and only if when there is a local capability to absorb the technology owned by the foreign company to other similar industries which potentially dictates a large scale participation of local personnel's in the FDI companies at a critical level. Currently the government is aggressively promoting foreign direct investment with the intension of development of the country. The development of the country is depending on the development of the industry sector which is fully depending on technology and innovation. In this regard the number of foreign investors currently destined to our country might not be small, but most of them are attracted towards labor intensive sectors mainly the textile & garment. The main objective of the study is to go through to understand the level and conditions of contribution of foreign firms to the transfer of technology to local firms and personnel's.

1.2. Statement of the Problem

Ethiopia is promoting FDI and accepting various foreign investors by providing encouraging policies and availing infrastructure. The country has been demonstrating significant commitment in expanding industrial parks& zones that would facilitate proper environment for Foreign Direct Investment. These parks & zones are key elements of the infrastructure supporting the growth the country has been pursuing. The construction of the parks& zones is the continuation of nation's commitment to alleviate poverty and ensure sustainable economic growth.

The expected benefits of Industrial Park& zone development in Ethiopia includes technology transfer. Realizing this benefit can ensure accelerated and sustained industrial growth that enables to achieve industrial structural transformation.

The transfer of technology through foreign firms would be effective if and only if when there is a high level of local participation and if there is a clear policy and binding law in which these foreign firms in the industry park and zone will engage in the capacity building activity for local firms.

Thus, this study aims at exploring the level of linkage between foreign firms in the industry park and zone with local firms/institutionsand how foreign firms in the industry park and zone

contribute for the technology capacity building activity of local firms& personnel's directly or indirectly and also reviews the policies and laws in this specific topic.

Research Questions

1. What role does these firms in the industry park and zone play in the transfer of technology?
2. What are the interaction methods between foreign firms in the industry park and zone with local firms?
3. What are the challenges of the firms in the industry park and zone in terms of technology transfer enabling activities?
4. How investment policies influence foreign firms for technology transfer for local firms & local employees? (specific in the industry park and zone)

1.3. Objective of the Study

1.3.1. General Objective

The general objective of the study is to investigate the level of contribution of foreign firms in the industry park and zone for technology transfer by identifying the basic technology transfer enabling activities and proposing recommendations for the findings for policy makers as an additional input.

1.3.2. Specific Objectives

- ✓ To investigate influence of policies with regard to technology transfer.
- ✓ To investigate the linkage between foreign firms in the industry park and local firms;
- ✓ To investigate the practices of transfer of technology in Industrial Parks and zone
- ✓ To identify the technology transfer enabling activities in the industry park and zone.

1.4. Significance of the Study

Technology development through own financial and technical source for developing countries is a very expensive task. Due to this reason many developing countries tries to increase the volume of inward flow of FDI. This implies that the availability of technology often is connected with foreign firms for developing countries like Ethiopia. It is evident that foreign direct investment plays an important role in the development effort among developing world as a source of technology and capital.

The end result from this particular research shows possible ways to cultivate technology transfer enabling activities from foreign firms in the industry park and zone to local firms and to give policy and regulation guideline for the government on FDI in a way to assist the local firms to build up their technological capacity. It can also be used as a background for other researchers who are interested in doing research related with technology transfer.

1.5. Scope & Limitation of the Study

The research work has been conducted with in a short period of time and under a limited financial and human capability and as a result, the survey includes only some selected foreign firms in the industry park and zone. For this reason, the conclusion of this study might not strictly extend to all foreign firms in the industry park and zones found in the country.

1.6. Organization of the Study

The paper is organized in five chapters. Chapter one presents the introduction part. The second chapter shows the critical review of the related literatures relevant to understand the topic of the study deeply. The third chapter deals with the research methodology, which includes the research design and approach used, methods adopted, population & samples, questionnaire design, research stages and data analysis techniques used. Chapter four contains results, discussions and analysis and the fifth chapter summarizes the main results of the study and gives some recommendations.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Theoretical Literature Review

2.1.1. What is Technology

Technology may be defined as the information necessary to achieve a certain production outcome from a particular means of combining or processing selected inputs. Many technologies may generate the same outcome but they may differ in terms of their efficiency. (Kadah Mohamed 2008) A technology may be quite specific or it may encompass several sub-processes, such as producing intermediate inputs within an overall value chain. Technologies may be particular production processes, intra-firm organizational structures, management techniques, and means of finance, marketing methods, or any combination of these. All contribute to the productivity with which outputs are generated from inputs and to the market value of those outputs. (Kumar Nagesh, 2003)

The crucial role played by the technological progress in the economic growth is now widely accepted (Romer, 1994). Technology can stimulate economic development and industrialization. It can take two forms, both of which are valuable. Technology can be incorporated in a production process (e.g., the technology for discovering, extracting and refining oil) or it can be incorporated in a product (e.g., personal computers) (Hill, 2000). However, many countries lack the research and development resources and skills required to develop their own native product and process technology. This is particularly true of the world less developed nations. Evidence provides that the vast majority of economic studies dealing with the relationship between FDI on the one hand and productivity and/or economic growth on the other hand, have found that technology transfer via FDIhas contributed positively to productivity and economic growth in host countries (OECD,1991).Technologies that are transferred to developing countries in connection with foreign direct investment tend to be more modern, and environmentally 'cleaner', than what is locally available. Moreover, positive externalities have been observed

where local imitation, employment turnover and supply-chain requirements led to more general environmental improvements in the host economy.

Today, technology has become the most important source of economic growth, competitiveness, wealth, power, prestige, and even independence. For a long time, capital and labor were considered the principal factors of production. With the increasing globalization of business activities, knowledge and information have been gaining importance as vital elements of any firm's success in today's global economy. In fact, we are moving from an industrial age to an information age, in which technology has become the most decisive factor of competitiveness. Factors such as technological leads and lags, product differentiation, and economies of scale and scope play an ever-increasing role in comparative advantage building. In addition, rapid advances in science and technology and increasing accessibility to the fruits of new knowledge both lead to rapid obsolescence, and thus to enhancing the role technology plays in every day's life of the business world. (World Bank,, 1999)Technology can be classified as embodied or disembodied. Technology is a physical embodiment of an idea that is helpful for accomplishing a task. Technology can be tools, techniques, or materials. Information may be embodied in the form of particular products, which might be reverse engineered to discover the underlying processes. It may be disembodied as codified technology or as know-how. There is a wide variation in the degree of embodiment across products and services. Technologies have utility if they are used in tasks that someone believes facilitates living a good life and the metrics measuring better utility can be performance and ease-of-use. Performance is a measure of functionality. It addresses how the end-user actually completes the task with the aid of this technology. Ease-of-use is a measure of the difficulty an end user will experience when using the technology to attain the promised performance. It is usually measured in ordinal or cardinal scales using characteristics and features of the technology. (Speser L. et al2006) For any production process or provision of a service, technology is an important input. Without the help of technology, no organization or individual could produce a product or provide a service. Moreover, the quality of the product or service would substantially depend upon the quality of technology employed. The profitability of an organization is linked not only to the resource

availability and its optimum utilization but also to the technological content of its products and services. (Kumar Vinay,2005)

2.1.2. The Development of Technology Transfer

Technology transfer is not a new thing. Researchers have traced back technology transfer process to the prehistory of the human species: where technology transfer largely involved tacit knowledge which is evolutionary prior to explicit knowledge. (Donald, 1991) As there were no written languages until 3000 BC, technology transfer had mainly occurred through language; which were supplemented by equations and diagrams which constitute as the major means of explicit transfer of technological knowledge. The spoken language and gestures have explicitly transferred technological knowledge in friendly encounters. However, much of prehistoric technology transfer between people occurred when people with superior agricultural technology assimilated or eliminated those who could not reproduce as rapidly. (DimondJ. 1997)

Segman (1989), who conducted a historical review of technology transfer, traced the technology transfer process from the Neolithic times, the role of Arabs played in transferring technologies from East to West and the transfer of English textile expertise to the American textile industry in the 18th and 19th Centuries. In the 18th Century, despite the English law preventing knowledge migration, France eventually managed to obtain 'specialized steelmaking know-how' by importing English workers and through industrial espionage. (CameronE.H. 1960) The success of the American textile industry in 18th and 19th Century was due to the transfer of knowledge and expertise by the English textile industry. Previous studies have shown that certain industries collapsed, for example the English clock and watch industry, due to the industry resistance to the opportunities of technology transfer. (Irwin H.et al 1998)

The concept of technology transfer originated in 1945. In "Science: The Endless Frontier," an influential report prepared for President Franklin D. Roosevelt, Vannevar Bush emphasized the importance of basic research to a strong economy. Before 1940, little thought was given to the importance of technology. However, the value of technological advances to a strong military

defense was recognized during World War II. The emerging needs of the U.S. military resulted in a large increase in government-sponsored research. Government facilities could not accommodate all the R&D projects needed to fulfill U.S. military needs. The government began to contract with qualified companies, universities, and nonprofit organizations, but with no overall plan for handling the intellectual property that would be developed. (Industrial Partnership office, 2005.) Indeed, different approaches to shape and govern the technology transfer efforts have been seen. Technology transfer as a domain covers all activities around technological development. Few technologies transfer models were developed after the World War II to govern the implementation of technology transfer activities and their application to marketplace.(UNCTAD, 1996)

2.1.3. Benefit and Challenges of Technology Transfer

The challenges of technology and knowledge transfer have over the years been a great concern to researchers. Because of the closeness between these two elements, their challenges are almost similar. Samli (1985), model the pattern of technology transfer into six dimensions: geography, culture, economy, business, people and government, while Egbu (2000), looked at knowledge transfer in six dimensional ways; people, content, culture, process, infrastructure and technology. These shows that the challenges and benefits of technology and knowledge transfer are similar and that one cannot do without the other. One of the benefits of technology transfer is globalization of industries. Technology transfer brings the world together as one large market place. When technology transfer is properly transfer around the world from developed nation to less developed nation, economic vibrancy will be seen and nation will draw closer to one another making the world look like a large global market place. Internationalization of domestic market is also a benefit to technology transfer. Product produced by domestic market could compete with large international industry if proper technology is transfer to the domestic market. This will increase production and also economic growth. Some of the barriers of technology transfer to developing countries are also great. These includes; loss of intellectual property, exploitation of indigenous employees, lack of infrastructure, employee's attitudes, government policy/legal protection, geographical location, environment, etc.

2.1.4. Key Factors that Influence Technological Transfer

There are several factors that influence the success of the technology transfer process. The literature often refers to these factors as 'barriers' or 'constraints'. This paper refers to them as influencing factors, as the other terms have negative connotations which may not be true of all the factors.

Successful technology transfer involves careful manipulation of this complex system of factors to take full advantage of potential synergy within the system. The factors include those that can be controlled such as technical competence, and those that are more difficult to control suchas socio-political conditions. Examples of the latter are:

- ✓ Economic structure: global trade, job creation, supply and demand, state funding, trade agreements
- ✓ Social legacy: illiteracy, values, culture, previous exposure to new technology
- ✓ Political framework: political stability, protection of monopolies
- ✓ Industry standards and regulations: performance requirements, applications, bureaucracy, formalized procedures, institutional policies
- ✓ Legal aspects: intellectual property rights, transfer agreements, licensing, patent rights, royalties.

The paper will focus on those factors that can be controlled.

2.1.4.1.Organizational/Institutional Factors

The following factors that are related to the receiver organizations to which technology is transferred should be considered carefully

- ✓ The pace of technological change is usually faster than the rate at which organizational changes can be assimilated and institutionalized. This poses a problem as employees have to

be sensitized and prepared for change, and organizational systems and procedures have to be modified to deal with the changes

- ✓ A receiver organization's capacity or ability to absorb new technology is influenced by the level of prior, related knowledge and expertise (i.e. basic skills, shared language, technological acumen, functional specialists) in the receiver organization
- ✓ A culture of action orientation, risk taking, receptiveness to internal and external breakthroughs, and a high tolerance for failure should be present.

In the industry Parks& zones this issue is complicated by the often short tenure of senior management on the mines who may be unwilling to support long-term technology development when they will not be in the position to enjoy the benefits. The case study on impact ripping clearly highlights the importance of educating the workforce on the need for the new technology as well as the importance of follow-up actions by management.

2.1.4.2.Human Factors

People are the key to successful technology transfer, as people and not papers transfer technology. This implies that the people in the transfer process have to be:

- ✓ Informed about the process
- ✓ Consulted about their needs, concerns, perceptions, attitudes and expectations
- ✓ Trained/mentored to understand and utilize the technology to its fullest extent.

What this means is that, when new technology is imposed on receiver organizations without ensuring internal receptivity, it is bound to fail. A very real factor influencing technology transfer is employee attitudes or resistance to change, also referred to as the 'not invented here syndrome'.

Once again, the case study on impact ripping emphasized the need for both educating the workforce to 'sell' a new technology to them, and then training them in the use of the new technology.

2.1.4.3.Integration Process Factors

Integration of technology with the rest of the system is essential for maximum benefit. Integration requires effort and resources going well beyond technology acquisition and training. The optimum performance of technology is obtained by redesigning and restructuring the entire system in which it is utilized.

The case study on impact ripping illustrates that throughout the history of the development of mechanized mining, the technique that proved most successful in the mining application was that one which was more easily integrated into the mining cycle.

2.1.4.4.Technology Push Vs Demand Pull

Allowing the researcher or developer to set the research agenda unilaterally so that the dominant relationship consists of either the researchers pushing their results onto product developers or product developers pulling work out of researchers creates an unhealthy situation.

However, most technology-based interaction between the technology source and the user organization makes use of market-pull mechanisms. This market- or technology-pull is more likely to result in successful interaction because the technical problem or opportunity is located within the user organization.

Despite the advantages of market-pull technology transfer, one should not lose sight of the fact that new technologies, particularly breakthroughs, have emerged through technology push, e.g. the use of nuclear energy. Balance between technology-push and market-pull is therefore important.

2.1.4.5.Communication Factors

A significant number of technology transfer problems can be attributed to ineffective information exchange among technology sources, potential users and intermediaries. Considerable amount of attention should be given to reducing communication barriers.

2.1.4.6.The Nature of New Technology

The most important aspect of technology transfer is the nature of the technology. The more concrete the technology, i.e. the extent to which the technology is understandable, demonstrable and unambiguous, the greater the probability of success. People-embodied technologies are therefore more difficult to transfer than product-embodied technologies.

The relevance of the project to the receiver organization's needs, interest in the subject matter, project goals and demonstrated usefulness of research results will have a huge impact on the transfer process.

2.1.5. Nature of Technology Transfer in Developing Countries

The technology and knowledge transfer has been a great challenge in developing countries because of lack of infrastructure and educational development of the people. For developing countries to achieve technology transfer certain factors as to be in place, such as good investment policy, basic infrastructures, attitude of people, good communication networks, etc. Over the years, developing nations have tried to encourage foreign investment participation in their countries, but these have been very difficult especially because of the political un-settlement in these countries. Developing countries that have succeeded in attracting few foreign investments still lack the successful transfer of technology from foreign companies to indigenous companies, mainly because of competitive advantage. The lack of government participation and partnership with universities and research & development project (R&D) has been a great draw-back to the progress in knowledge transfer. University and R&D project are not well funded by government of the developing countries. There is no close relationship between companies and universities in developing countries. This has caused lack of knowledge transfer in these countries. Also, when

the issues of knowledge and technology transfer are being discussed, most developing countries believe in adoption of technology instead of the transfer. This is because, developing countries want a quicker way of gaining technology instead of going through the process of transfer which takes longer time to achieve.

Knowledge transfer is an important issue when taking about technology transfer. Technology transfer will only be achievable in developing countries if academic, policy makers and companies are involved in the process of knowledge transfer. Although, it has been proven difficult to measure the level of knowledge/technology transfer from foreign companies to local companies, but the measurement of transfer between foreign companies and local companies involves the observation of human communication/interactions, attitude, interest and motivation of all participant of transfer. Developing countries universities have always beeninvolving in the tradition way of lecturing/teaching without more involvement with companies for research and innovations. Developing countries should be involving in the development of knowledge-based economy and increase demand for innovation which has brought about new challenges for universities to move beyond their traditional role of educational institution and develop more outreach activities in partnership with company's (Etzkowitz and Leydesdorff, 1997; Etzkowitz and Leydesdorff, 2001; Etzkowitz and De Mello, 2003).

The process of technology transfer/acquisition by developing countries is one of learning and improving their technological capability (Barbosa and Vaidya, 1997). This is a complex, long-term process with various levels of technological competence such as the ability to use the technology, adopt it, stretch it, and eventually to become more independent by developing, designing and selling it.

2.1.6. The Methods of Technology Transfer Flow

For technology to be transferred, policy maker/government has to provide implemental policy that will enable joint ventures, FDI, co-production, company acquisition and transfer of ownership by multinational companies. If a country/company is thinking about adopting or borrowing technology, they have to provide good policy for the buying and selling of

technology, licensing and franchising. If technology has to be transferred the level of communication must be high, the altitude of both the transferor and transferee has to be positive. The transferee must be willing to learn new ideas and the transferor must also be willing to teach or give out the idea that they have. Technology transfer is achievable if it is genuine, practicable, acceptable, high knowledge base of the transferee and infrastructure availability. Knowledge transfer could be achievable if academics, policy maker and industries are involved in the process.

2.1.6.1.Foreign Direct Investment (FDI)

FDI have been a channel for technology transfer approved by many authors because of its direct impact on economy development and low cost of transfer. But the choice of choosing what method to channel technology depends on the countries market size, market growth, the threat of imitation, and the IPR. For developing countries to acquire technology through foreign direct investment there should be abundance of skilled and semi-skilled workers and also a strong IPR protection to attract investors, these will increase the level of tacit knowledge (know-how) absorption. The multinational cooperation (MNC) is media for the transfer of knowledge and technology. Expatriates are used for the transfer of knowledge and technology by the MNC. According to Dana &Snejina (2004), the more MNC uses expatriate for temporary assignments (Assignment less than a year), the greater the expatriates‟ ability to transfer knowledge while the more the MNC uses expatriate for long-term assignment s, the greater the willingness to transfer knowledge.

Haris (2002) argued that, expatriates‟ with long-term assignment remain critical for skill transfer, management control and management developments while expatriate with temporary assignment are used mainly for skill transfer.

2.1.6.2.Joint Venture

Joint Venture typically involves less risk than strategic alliances, acquisitions or financing subsidiaries, they tend to be more common, as skills, attributes and resources are sought through mutual business objectives (Czinkota et al, 1994). With joint ventures companies can pursue

common business-related purposes, use harmonizing technology or research techniques, increase capital and bargaining power, extend the risk of scale; and surmount entry barriers gaining market share and therefore power (Boyett and Boyett, 2001; Linklater and Paines, 1990). The expansion of joint venture in any economy leads to Multinational Corporation; therefore, encourage technology and knowledge transfer. Mowery et al (1996) argued that joint venture is superior means to enhance a firm's positioning through capability learning and knowledge transfer.

2.1.6.3.Licensing Agreement

A License is a contract which authorizes the use or exploitation of the subject matter of the license for a specified purpose and period of time with all other right maintained by the owner of the technology (Thomas, 1998). He also argued that companies wishing to expand into the international arena are finding that licensing or transferring their technology provides a low risk and highly profitable alternative to direct export, establishing a foreign branch, subsidiary or joint venture. These arguments by Thomas can only benefit the transferor and not the transferee at the long run. The reason for technology transfer is to benefit both parties and at the long run, the transferee should be independent of the technology gained.

The motivation for licensing of technology and product could be for the penetration of the international market. Companies are willing to license their technology to countries where they do not have penetration through export or direct investment and also selling of their product.

Technology transfer can be stated as an exchange of expertise and knowledge from possessor to the recipient of technology. Technology transfer occurs because of the existence of buyers (transferees) and the sellers (transferor). Transfer of technology is more than just the moving of high-tech equipment from the developed to the developing world, or within the developing world. Moreover, it encompasses far than equipment and other so-called ―hard‖ technologies, for it also includes total systems and their component parts, including know-how, goods and services, equipment, and organizational and managerial procedures. Thus technology transfer is the suite of processes encompassing all dimensions of the origins, flows and uptake of know-

how, experience and equipment amongst, across and within countries, stakeholder organizations and institutions. Technology transfer occurs through many different avenues-new technology is embodied in imported inputs and goods sold, directly through licensing agreements, or absorbed by exporters who learn about new techniques from their foreign buyers.

In other cases, learning by doing, combined with investment in formal education and on-the-job trainings, is critical. There are two ways of making a transfer: either purchase it or develop it. By definition, a transfer of technology means a definite change in process, in product, in power, in attitude, in want and desires, and also in situations that are political, social, economic, or environmental. In today's world transfer is mostly from developed country to the developing country.

The transfer of technology from advanced countries to emerging economies constitutes one of the fundamental ways to pursue progress towards convergence between the two economies in terms of standards of living. Nevertheless, the level of Research & development (R&D) expenditure that developed countries can afford gives them a clear advantage in the technological field. It therefore seems logical for emerging countries, which have a more limited investment capacity, to try to exploit technological advances with the least possible expenditure.

Undeniably, technology has emerged as a crucial factor in development of markets, which are ever evolving and subject to change at every instant. For any nation/firm to remain competitive in the market and achieve its goals it is necessary to stay in constant touch with the latest technology and latest consumer needs and requirements. The development experiences of developed nation demonstrate that the technology contributes more to production and productivity than physical inputs like labor and capital. Thus the technology transfer has been of great significance in view of bridging technological gaps and enabling underdeveloped countries to accelerate the pace of development at par with developed nations.

Technology transfer is a system that encompasses the social and economic fabric of a country. Where technology has been effectively transferred, there is a visible change –from the person to the production system as well as compatibility with the needs, in the institutional framework,

skills, training, financial capacity, promotion, and active support of endogenous capacity and appreciation of the natural environment of the recipient country.

2.1.7. Role of Foreign Direct Investment for Technology Transfer

Economic growth in developing countries also depends on their ability to adopt and implement new technologies. New technologies may become available in developing countries through various sources such as domestic research and development activities, imports of capital goods and equipment, buying technologies through licensing, franchising, or foreign direct investment. Developing countries, however, faced with many internal and external constraints that are not congenial to local research and development activities, including their usually pronounced institutional backwardness. Equally difficult for developing countries is to procure technologies via external arm's length transactions such as franchising and licensing as industrialized countries are increasingly reluctant to transfer their technology. Thus, developing countries prefer foreign direct investment as a mode of technology transfer to other modes.

Foreign direct investment is in the form of pure transferred technology engenders economic growth. From the perspective of the new growth theories, the transfer of technology through foreign direct investment in developing countries is especially important because most developing countries lack the necessary infrastructure in terms of an educated population, liberalized markets, economic and social stability that are needed for innovation to promote growth (Calvo and Sanchez-Robles, 2002).

Foreign direct investment generally assumed more productive than domestic investment, because foreign direct investment encourages the incorporation of new technologies in to host economy. In this view, foreign direct investment-related technological spillovers offset the effects of diminishing returns to capital and keep the economy on a long-term growth path. Endogenous growth models acknowledging the role of technological progress in the end, propose that introduction of new accumulating factors such as knowledge, human capital, innovation will induce self-maintained economic growth, Promote learning by doing and consequently foreign direct investment stimulates economic growth in host countries. Triggered by Lucas (1988) three

significant sources of growth were highlighted: new knowledge, innovation and public infrastructure.

2.1.8. The Need for Technology Transfer

There are a number of specific strategies to achieve economic development. Among these are increased savings, international trade, foreign direct investment and technology transfer. Increased savings is what is also known as supply side economics. Whether an increase in savings is achieved voluntarily or by force, increased saving methods have not been very popular in developing countries. (Adejumobi, et al. 2007) International trade has been and is a popular development strategy. Newly developed countries such as Hong Kong, Singapore, South Korea and Taiwan in particular have achieved their current economic status through successful international Trade. However, most developing countries have not been successful in this area and, in fact; there is a little possibility for many of them becoming successful in international trade. Foreign aid is logical development strategy. However, because of its political implications and much mismanagement that existed in the allocation and utilization of aid funds the outcome has been near zero.(Adejumobi, et al. 2007) Technology transfer, if successful, implies increased productivity and ability to produce. Regardless whether the newly transferred technology is used to substitute imports, to stimulate exports or just to develop new domestic industries, it plays a profound role in the economic development process. Thus, of all the key strategies, technology transfer is considered to be the most effective alternative in economic development. It is desirable to fill gap, which is widening, between developed and developing countries of the world, it is of the utmost importance that there must be successful transfer of technology to developing countries. (Adejumobi, et al. 2007)

2.1.9 Technology transfer effectiveness

The effectiveness of transfer activity is evaluated in several different ways in the literature (mason 1980, Teece 1981, Schwartz 1982, Madeuf 1984, Mytelka 1985). They measured transfer effectiveness by calculating the transfer cost, the speed, scope and level of internal versus external transfer activity. R&D sufficiency in the local facility, control of imported technology, and whether the technology transferred can assist with the development of new skills and technology that will alter the host country's comparative advantage. They suggested that the imported technology must be assimilated.

A number of factors that influence the effective transfer have been identified and examined by Reddy and Zhao (1990).

The factors include:

- The supplier firm's willingness and ability to transfer technical knowledge
- The supplier firm organizational structure
- The absorptive capacity of the recipient firm
- The mode of transfer used
- The relationship between interacting countries and firms &
- Training.

2.1.10 Technology transfer element (Indicators)

Technology transfer element involves seven major elements including transferor (source), transferee (receiver), technology being transferred, transfer mechanism, transferor environment, transferee environment, and great environment. The entity that possesses the technology is known as the transferor. The entity seeking the technology is the transferee. Technology is combination of technoware, humanware, infoware and orgaware. A technology transfer mechanism is any specific form of interaction between two or more social entities during which technology is transferred. The transfer environment is the set of conditions such as economic status, its technological status, and policies and commitment towards technology transfer

activities, under which the transferor is operating at the individual, organizational, industrial or national level.

The transferee environment is economic status, technological status, infrastructure, skills availability, attitude and commitment towards change. These factors determine the absorptive capacity of the transferee. There are great environments surrounding the transferor and transferee environments such as political relationship between the countries, exchange rates, investment climates, trade negotiations, balance of trade problems, technological levels of the nations, and international competition.

2.2. Empirical Literature Review

One of the most common and least expensive ways by which foreign technology gets diffused in host countries is through labor turnover, as domestic employees (especially employees in higher level positions) move from foreign firms to domestic firms. Bloom (1992)found substantial technological transfer in South Korea when production managers left multinationals to join domestic firms. Indeed, foreign firms sometimes pay higher wages in order to retain their workers, and thereby prevent domestic firms from appropriating their superior technology (Glass aj Saggi, 2002).

Haddad, M, Harrison's A,(1991) study of the FDI effects on the manufacturing industries in Morocco. They suggest that large technology gaps between foreign affiliates and local firms and/or the advanced MNC technology inhibit technology spillovers. Kokko (1994) points out that the occurrence of technology transfer spillovers may be influenced by various host country and industry characteristics. He further suggests that spillovers are negatively related to the complexity of MNC technology, or the technology gap between MNCs and local firms in Sweden. Technology transfer can occur if the technology brought by FDI is compatible with the level of the host country.

In the world economy there is great inequality in technological efforts. An overwhelming proportion of scientific, technology, research and development activities take place in the advanced economies. Almost all patent applications are concentrated in developed countries.

The same holds for scientific publications. Large multinational companies take the lead in innovation. (MaskusE. etal. 2003) The fifty largest multinationals alone account for 26 per cent of all patents in the United States. According to estimates by the World Health Organization, 95 percent of all medical research focuses on the health problems of the advanced countries. Developing countries invest a much lower part of GDP in research and development (around 0.5%) than the advanced countries (around 2.0 to 2.5 per cent). Moreover, there is a wide gap between those who have access to technology and use it effectively and those who do not. The technology gap exists between those who can create and innovate to produce new technologies and those who cannot. It also exists between those who can access, adapt, master and use existing technologies and those who cannot. So harnessing the potential of technology for development goes beyond creating new technologies but also finding ways to access, adapt and use technology that already exists for the benefit of all the population. (World Bank,1999) The technology gap is evident in many areas such as:

- In Japan there are 861 patents granted per million people. In many developing countries the number is 0;
- 84% of articles published in scientific journals are from developed countries;
- In 2002, only 10 countries accounted for 86% of world total investment in Research and Development (R&D) and
- In Finland, 27.3% of university enrollments are in science subjects. In developing countries, this figure is around 0.1%.

The ability of countries to acquire, master, adapts and improve upon scientific and technical knowledge is a major determinant of their capacity to achieve sustainable economic growth. Both mature and new technologies can be applied to address specific local needs. A key area where the technology gap exists is in research and development. R&D capability is essential to develop access, absorb and master new technologies. Low levels of R&D reinforce the existing technology gap making it harder for countries or companies to compete. In any case, closing the technological gap is regarded as a necessary step towards economic development. Technology is

the most important factor of production and its growth is essential to propel a country into self-sustained growth.

2.2.1 Experience of Developing Countries

2.2.1.1Malaysia Experience

In the first phase industrial policy (1960-1985), Malaysia employed both import substitutionand export promotion policies, rather than free market trade policy. Its export promotionpolicy attracted foreign transnational's to invest in processing industries for export. So while import-substituting industries were given protection, generous incentives were devised in the area of export promotion.

However, despite the protection from import competition, locally owned light and primaryprocessing industries were not able to develop their competitive status. They remained technologically backward as they were not linked to MNCs led technologically better advanced export industries. A further set back was the government's political agenda which linked the industrialization program with the improvement of the ethnic Malay's economic status.

Failure to develop the indigenous industries prompted the government to establish state owned large firms, very much in line with the Korean approach. However, such state owned giant industries suffered large losses in the early years of their operation. In addition, many of the other smaller state-owned enterprises also performed poorly as indicated above, Malaysia was successful in its FDI program. A generous fiscal incentive, disciplined and literate labor force, good infrastructure, low wages, efficient administration, favorable regional location, and favorable investment climate helped Malaysia to attract MNCs and launch a successful high-tech export path.

The new industrial policy in the second phase shifted to more selective strategy, i.e. providing critical factors for industrial development (skills and training, technical support, finance, quality improvement, and the like). The government moved to strengthening science and technology institutions and stimulating private R&D enterprises.

Industrial restructuring programs were devised to provide cheap finance for the textile andengineering industries. Infant industry protection continued but has been governed by dynamic notions of comparative advantage, promoting the development of industrial sub sectors that are intended to replace light manufacturing activity as the main exporters. Therestructured public sectors retained a role in industries (such as automotive, petrochemical,iron and steel, etc.) where the required investments were large and long gestation periodsinvolved.

Fresh and more generous incentives were designed to attract FDI. Policy reforms, includingthe introduction of the Investment Incentives Act 1968, the establishment of free trade zones in the early 1970s, and the provision of export incentives alongside the acceleration of open policy in the 1980s, led to a surge of FDI in the late 1980s. To attract a larger inflow of FDI, the government introduced more liberal incentives including allowing a larger percentage offoreign equity ownership in enterprise under the Promotion of Investment Act (PIA), 1986.

Apart from these policy factors, it isgenerally believed that sound macroeconomic management, sustained economic growth, and the presence of a well-functioning financial system have made Malaysia an attractive prospect for FDI. The government moved to more selective policies on export oriented MNCs. It started to use incentives to guide FDI into higher value-added activities and more technology intensive processes.

2.2.1.2 Singapore Experience

Singapore's industrialization journey was successful till the late 1970s with an annualized growth of 8% during this period, bringing its per capita GDP to $6000 in 1980. Its industrialbase was built upon the investments of the then 'Multinationals' who provided jobs in massassembly in the factories and the numbers of multinational companies increased.

Theyprovide sources of technology transfer to upgrade the technology level of Singapore, in many industries including heavy metalworking and electronics. The companies obtain substantial funding from the government to develop required technology and automation systems.

Training centers and technology showrooms were established.

The contribution of FDI firms for technology transfer in the case of "Bole Lemi Industry Park" and "Eastern Industry Zone"

In the 1980s, Japan was emerging as a successful model of industrialization. It was recognized that the quality, productivity and technological models of Japan should be a model for many developing countries. In 1979, Singapore approached the Japanese government for aid in providing training in the industrial technologies of plastic injection, tool and die, mold making, industrial electronics. This aid resulted in the establishment of the 'Japan Singapore Training Centre (JSTC)', which was one of the first instances of a foreign technology aid to Singapore.

Upon completion of the JSTC, the Japanese government generously provided aid to Singapore in its second phase in 1983, resulting in the establishment of the Japan Singapore Technical Institute (JSTI). Moreover, other training institutes are established by joint interaction of the Singaporean government and other foreign countries, these include the German Singapore Institute (GSI), French Singapore Institute (FSI) and Philips Singapore Institute (PSI), in which the most up-to-date equipment are donated by suppliers and used for demonstration, training and development purposes.

The remarkable transformation of Singapore is a powerful testament to the potential benefits of globalization. Quite simply, the city-state could not have achieved its economicmiracle without extensive economic interaction with the rest of the world. In particular, Singapore is heavily dependent on foreign trade and the relative share of foreign trade innational output is consistently among the highest in the world. Due to its limited population and talent pool, the city-state also relies on foreign human resources to relieve shortages in a wide spectrum of skills, from domestic maids to biotech scientists.

In addition to foreign trade and foreign labor, Singapore is exceptionally open to foreigncapital as well. Foreign capital in the form of foreign direct investment has played a pivotalrole in the economic development and growth of Singapore. The rapid growth of an export oriented manufacturing sector which laid the foundation for the city-state's transformationwas powered largely by foreign MNCs. While the Singaporean economy is a powerful testament to the benefits of globalization, it is an even more powerful testament to the benefits of FDI. Perhaps to a larger extent than any other country in the world, Singapore has relied on foreign MNCs to drive its own industrialization and growth.

The overwhelming consensus is that FDI has been highly beneficial for the Singaporean economy and indeed the country's remarkable leap from the Third World to the First Worldwould not have been possible without FDI. More specifically, FDI has accelerated the development of an export-oriented manufacturing sector, which has served as the primaryengine of engine growth, before the economy diversified into financial services and otherservices. FDI made major contributions to exports, employment, skill creation, creation oflocal companies and business opportunities through dynamic linkage effects, and economic growth.

2.2.1.3 Chinese Experience

The government of china encouraged investment in high technology sectors (chemical fibers, micro-electronics, precision machinery, civilian aircraft, biotechnology and energy development) as well as infrastructure and agricultural developments. Investment in thepriority sectors would continue to benefit from tax preferences and foreign invested companies in these sectors would be permitted to sell up to 100% of their output in the domestic market.

In 1998 the State Planning Commission identified eighteen industries, mostly in high technology sectors, where China wished to promote further foreign investment. These sectors would be granted a restoration of duty free status on capital equipment imports. These newly promoted sectors were high-technology industries, new technologies, transport and telecommunications equipment, electric power generation, aviation, oil and petrochemicals, machinery, electronics, pharmaceuticals, medical equipment, textiles, metals and metallurgy, light industry, the service sector, and agriculture. At the same time the State Planning Commission also reaffirmed broad limits to foreign ownership in businesses in areas considered to be key sectors of the economy - such as nuclear power plants, satellites and aviation.

Also in 1998 the government announced that the tax systems for foreign and domestic companies were to be merged by the year 2000, a change that would more than double the tax burden on some foreign-invested enterprises. However, favorable treatment was retained for sectors and areas where China remains keen to attract foreign. This removal of some tax incentives for foreign investors signals a more discriminatory approach to foreign investment and is part of the Chinese government's attempt to redirect growth from basic industries (e.g. shoes and toys) in

favor of higher- technology sectors. In effect, the foreign investment regime is now more closely linked with domestic industrial policy priorities and wider economic and social objectives.

China's supportive policies toward FDI increased the inflow of FDI in the late 1980sand itbecame even more frequent in the early 1990s. Since 1992, when China's central authoritydecided to expand the scale and geographical scope of foreign investment, an increase in the foreign direct investment in China emerged.

2.3 The Development of Technology Transfer in Ethiopia

The idea of modern science and technology in most African countries was introduced in the beginning of the 20th century. Even in the case of Ethiopia, it is believed that the first half of the 20th century is considered as the beginning of application of modern science and technology along with the establishment of higher learning institution although its role to bring about sustainable socioeconomic development of the country has not been to the desirable level. (MoST 2006)

It was during Minilik II era that modern technologies are started and introduced to Ethiopia from the westerns technological advancement. He was fascinated by modernity and had keen ambition to introduce Western technological and administrative advances into Ethiopia.(Gulelat G, 2010)

The notable tries had been performed technology transfer in Ethiopia during EmperorMenelik. It was Emperor Menelik who brought, through foreign engineer, some of the technologies and instruments that we use today. Tap water (1894), electric power and telephone (1897), gramophone (1897), mills (1901), bicycles (1901), automobile (1908), bullet factory (1911) are a few among others. Due to wars and various attitude of religious closed door policies that existed even after the reign of Emperor Menelik, must have limited the country's external political and economic relations. This made the technological transfer very slow. (Adejumobi, et al. 2007) The main obstacle for these innovations was the resistance from the community which held that they were "the work of the Devil" a resistance that stretched all the way from the common people to

the priests around the Emperor who refused to drink tap water. The method that the Emperor used to curb such resistance was by testing the technologies first by himself, his family and his executives. For instance, he himself was the first chauffer, the first to use the grinding mill, the first photographer and the first movie spectator. Then technologies like the airplane and radio were introduced in 1929 and 1936 respectively. (Adejumobi, et al, 2007)

A number of technologies were introduced by Emperor Haile Selassie in and around Addis Ababa. These include the establishment of schools and universities as well as roads, the airline and TV transmissions. It is to be recalled that technological transfer was better particularly during the last days of the Emperor.When the Derg came to power in 1974, the country's diplomatic ties were diverted to the Eastern bloc. And as such, lots of technologies and communications were brought to the country from North Korea, East Germany and the USSR. As the policy discouraged private participation and innovation, and as the economy was under government control, the country was almost alien to new innovations. (MarcusG., et al, 1994)

The post-1991 period began with the coming to power of EPRDF in 1991 and theadoption of the WB/IMF sponsored Structural Adjustment Program soon after. Among the stated objectives of the new government were: reducing macroeconomic imbalances, eliminating structural distortion, improving the country's human capital and infrastructure as well as poverty reduction. The government implemented a series of reform measures in order to change the command economic system that had been in place to a free market economy, to speed up the integration of the economy into the world economy and to encourage the wider participation of the private sector in the development process of the national economy (FDRE MOFED, 2002).

In the present system, the government has been undertaking various activities to expand its economy to alleviate poverty and compete with the global markets. In order to realize this, the nation is striving to be the hub of light manufacturing industries in Africa. The country registered remarkable economic growth in the past two decades, which is expected to be sustained and attributed to many factors mainly to the development prudent policies and strategies of the country that have a clear national vision aiming to achieve middle-income status by 2025.

In connection to this, the nation established appropriate policies and strategies for the manufacturing sector's development which is an integral policy direction to the achievement of a vibrant and competitive industrial sector.Ethiopia has been demonstrating significant commitment in expanding industrial parks that would facilitate proper environment for Foreign Direct Investment. These parks are key elements of the infrastructure supporting the growth the country has been pursuing. The construction of the parks is the continuation of nation's commitment to alleviate poverty and ensure sustainable economic growth over a couple of decades. Although the country mainly concentrated on developing the agricultural sector in those years, it has been exerting efforts to develop the industrial sectors side by side.Through providing a location in which government, private sector and universities cooperate, these parks create environments that foster collaboration and innovation. They also enhance the development, transfer and commercialization of technology and global know-ledge. About 50 years ago, manufacturing industries in the country were dominated by cottage and handcraft industries which met most of the population's needs for manufactured goods such as clothes, ceramics, machine tools and leather goods. And it was impossible for the nation to invest on industry as it had no adequate capital. The only option the country had was to develop the agriculture sector and integrated it with the industrial development. Several factors including lack of basic infrastructure, the absence of private and public investment and the lack of any consistent public policy aimed at promoting industrial development contributed to the stagnation of manufacturing industries.

2.4 Industrial Park & zone Development in Ethiopia

In 2014 the Ethiopian Industrial Parks DevelopmentCorporation (IPDC) was established and since then has been actively developing plans and implementing strategies for the development of a plethora of industrial zones across the country. To date, four industrial parks have been constructed by the government, (Bole Lemi I, Hawassa, Kombolcha andMekelle), with the government spending $650 million. The formation of the IPDC in 2014 signaled somewhat of a change in direction. It gained momentum in 2015 with the Industrial Parks proclamation 886/2015.The IPDC was fully mandated to develop industrial parksin Ethiopia. As a public enterprise, owned and supervised by the government, infrastructure connecting industrial parks

with Ethiopia's core infrastructure is also part of the IPDC mandate. This joined-up strategy is indeed noteworthy. The IPDC aims to provide a one-stop-shop service for those investing in designated industrial parks in collaboration with the Ethiopian Investment Commission (EIC), the Ethiopian Revenues and Customs Authority (ERCA) and others. The Ethiopian government's strategy still acknowledges the role of the private sector as an engine in the industrialization process but within the developmental state framework, efforts to enhance "responsible capitalism" is central.

2.4.1 Industrial Park Proclamation of Ethiopia

The industry park proclamation 886/2015 of Ethiopia proclaim on 9 April 2015 defined the following terms about industry parks and other interlinked terms as follows;

"**Industrial Park**" means an area with distinct boundary designated by the appropriate organ to develop comprehensive, integrated, multiple or selected functions of industries, based on a planned fulfillment of infrastructure and various services such as road, electric power and water,onestopshop and have special incentive schemes, with abroad view to achieving planned and systematic,development of industries, mitigation of impacts of pollution on environment and human being and development of urban centers, and includes special economic zones, technology parks, export processing zones, agro-processing zone, free trade zones and the like designated by the Investment Board;

"**Corporation**" means the Industrial Park Development Corporation established under Council of Ministers Regulation 326/2014.

"Industrial park developer" means any profit making public, public-private or private developer including the Corporation engaged in designing, constructing or developing industrial parks in accordance with Investment Proclamation and Investment Regulations, industrial park developer permits and industrial park developer agreement.

"Industrial park operator" means any profit making enterprise that operates, maintains or promotes industrial park in accordance with the Investment Proclamation and Investment

Regulation, the industrial park operator permits and industrial park operator agreement and, includes the Corporation.

Key Statements in the Proclamation about Technology Transfer & Skill Development Obligations of an Industrial ParkDeveloper: Replace expatriate personnel or professional by Ethiopian nationals by transferring required knowledge and skills through specialized trainings. In this respect, the Ministry of Industry shall organize technical and vocational training program in collaboration with the concerned government entities and Industrial Park Developer (operator) whenever necessary. The Ministry of Industry shall facilitate technology transfer and skills development in general and domestic manufacturing sector capacity building in particular mainly through clustering and other best practice approaches. The Ministry of Industry shall ensure and supervise that the industrial park enterprises are provided with assistance such as extension services, technology, inputs and marketing and method of manufacturing.

Obligations of an Industrial Park Operator: Link domestic manufacturing enterprises with industrial park enterprises in order to develop their technological capacities and to benefit them from international market.

Obligations of an Industrial Park Enterprise: Allow entrepreneurship trainings of the technical and vocational education and trainings, collaboration trainings and that of higher education.

2.4.2 Existing Industrial Parks & industrial zone in Ethiopia

There are a few industrial parks that already started operation, and many more are under-construction and in the planning stage. Industrial parks in Ethiopia can be developed and owned by the government, foreign private developers or jointly by both (see Table 2.1).

Table 2.1: List of existing and planned industrial parks &zones in Ethiopia

Industrial zone	Developer	Location	Size	Status
Bole Lemi I	Government/IPDC	15km SE of AA center, about 30 min. drive	156ha; 20 factory sheds	Fully operational
Bole Lemi II	Government/IPDC	Adjacent to Bole Lemi I	186ha; 15 sheds and parcels of land planned	Under-construction
Kilinto	Government/IPDC	20km S of AA center	308ha with possibility of expansion	Under construction
Hawassa	Government	175km S of AA, half day drive	270ha	Phase I - Fully Operational
Dire Dawa	Government/IPDC	E of AA, 300km from Djibouti border	1,500ha	Under construction
Kombolcha	Government/IPDC	N of AA near Dessie	1,000ha	Completed but has not started production yet
Mekelle	Government/IPDC	Mekelle	1000ha	Completed but has not started production yet
Adama	Government/IPDC	Adama	675	Planned
Jimma Industrial Park	Government/IPDC	Jimma	350	Planned
Bahir Dar Industrial Park	Government/IPDC	Bahirdar	350	Planned
Air Lines Logistics Park	Government/IPDC	Addis Ababa	200	Planned

AwshArba Industrial Park	Government/IPDC	Awash area	225	Planned
Andido Industrial Park	Government/IPDC	Andido	425	Planned
Bishoftu Industrial Park	Government/IPDC	Bishoftu	180	Planned
AsaytaSemera Industrial Park	Government/IPDC	Asayta	274	Planned
Eastern Industry Zone	Jiang Su Qi Yuan Group (China)	S of AA; about 2 hour drive	500ha in total; 11 sheds of 10,000ha each	Fully operational
Huajian Shoe City	Huajian	Jemo area inside AA	138ha	Under construction
Gaizo	JV of Ayka& Government	Jemo&Gulale areas inside AA	3 factory Apartments, 4-5 stories high	Planned
Kingdom Linen	Kingdom Group (Hong Kong)	South end of AA	30ha	Planned
Ethio-Turk International Industrial City	Akgun Group (Turkey)	Sandafa, 35km N of AA	1,300ha in total, 100 ha for phase 1	Planned
George Shoe City	George Shoe (Taiwan)	Mojo; S of AA, about 2 hour drive	50ha	Under construction

Source: Industrial Parks Development Corporation, 2017

2.5**Summary of the Review**

In summary, the results of this study, which reflects our theoretical and empirical background, give us the following pre-understanding on the technological transfer in industrial Park & zone. The basis for technological knowledge transfer is the knowledge itself. It is understood that knowledge iscomplex, absorbed, coded information which is interpreted and internalized by a person, and organizations, it can be identified in almost everything connected to its business.

This comprises people, products, coded information or the work itself. In order to complete the process of technology transfer successfully both parties should have the same understanding of the topic in order to accomplish a successful sense-making process. Thus, the knowledge generation from available information to internalized knowledge is a complex and individual process, which is strongly dependent on the personal characteristics of the knowledge receiver.

In order to manage the technology knowledge gained in the industrial parks effectively, different strategies are possible, depending on the environment and the type of technology knowledge. In technological knowledge based industrial parks an appropriate management strategy would be the one which connects the advantages of codification, like the longevity of the stored information and the personalization, like the important influence of tacit knowledge and personal skills. Furthermore, this study concentrates on role of FDI firms on technology transfer in industrial Park& zone and on the conditions which support and enhance the knowledge transfer activities and their success. During this, certain barriers to technological knowledge transfer have to be taken into consideration and it is assumed to be possible to recognize the absence of some common barriers in the industrial Parks which, as a consequence enhance the technological knowledge transfer.

CHAPTER THREE

3 RESEARCH METHODOLOGY

3.1 Introduction

In this section of the paper, the research approachutilized in the course of the study, the research design, the population and sample size covered by the study, the types and sources of data used, the procedures followed during data collection, data analysistechniques applied and ethical considerations of the study are presented.

3.2 Research Design

This research evaluates the contribution of FDI firms for technology transfer in bole lemi industry park &Eastern industry zone. In this regard the descriptive type of research design was used. A descriptive study enables to explore new issues and to describe the characteristics of the variables of interest in a situation. Explanatory research is defined as an attempt to connect ideas to understand cause and effect, i.e. researcher wants to explain what is going on and how things come together and interact (Sekaran, 2003).

This thesis applies the explanatory research design method when designing the research question and the descriptive research design method for the different sub questions. Likewise, this study seeks to provide an accurate description of observation about the methods and ways which enables efficient technology transferring activities in the selected firms found in the industry park &zone. Given that the aim of this research was to evaluate and to understand the relationship between different variables in order to assess the level of contribution of foreign firms found in the industry park & zone for technology transfer, thus, explanatory and descriptive research design fit this purpose.

3.3Data Sources and Types

Both primary and secondary sources of data were used to conduct this research paper. The primary data were obtained through distributed and collected questionnaire and conducted interviews with different parties who have believed direct relationship with the research subject. During the process of gathering primary data **72** questionnaires were distributed and **67** respondentsreturn the questionnaire. Beyond this six interviews were made with government officials and company head of foreign firms.

Secondary data were collected from different available sources (published and unpublished) documents, the existing literature also used for theoretical study from all resources such as academic and scholarly journals, newspapers and magazines.

3.4Data Collection Procedures

The researcher uses mixed method both (qualitative & quantitative). In quantitative approach the pre designed questions are prepared for the purpose to address the research questions. In qualitative approach the interview questions are unstructured or semi-structured in pattern not closed questions like quantitative approach. In semi-structured interviews the researcher has an opportunity to check out various areas and to raise specific queries during the semi-structured interviews. The researcher prepared semi-structured questions that are helpful to take maximum information from interviewees and reaching to key persons because in closed questions it is possible that some important information will be ignored.

3.5Sampling Techniques and Sample Size Determinations

The study considered a sample frame of Bole Lemi Industry Park& Eastern Industry Zone based on the launching and duration of operation. The researcher employed stratified sampling followed by random sampling technique for the selection of foreign firmsamples in the industry park. It is hereby importantto mention that the present study adopt the stratified simple random sampling technique in order to collect the survey responses, which involves dividing the population into homogeneous non-overlapping groups (i.e., strata), selecting a sample from each

group, and conducting a simple random sample in each stratum. [Cochran, 1977] [Trochim, 2005]

The samples used for analysis were selected from the total population of 88 foreign firms out of which 12 firms foundin Bole Lemi industrial park& 76 firms found in Eastern industry zonewhich are currently under business operation, since there are similarities among foreign firms in the same sector stratified random sampling was carried out toselect samples from each sector.

strata were formed based on the sector of foreign firms in the IP& IZ then the sample was selected from each stratum. In the selected industry park& industry zone (Bole Lemi &Eastern) there are 88 foreign firms in the form of FDI that took investment license to operate in different sectors&startedfull operation. The investments are of different types which are apparel, textile, electronic, construction, cosmetics, metal, automobile assembly, spare part, packaging, plastic recycling, printing, food processing and cable manufacturing.

The target populations of the study were all foreign firms currently operating in Bole Lemi Industry park & Eastern industry Zone. According to Yemane (1967) for population whose size is known, sample size can be determined using the following formula.

$n = N/1+N (e^2)$,

where, n= sample size,

N= Population size, and

e= the margin of error.

Then at 5% significance level, the total sample size $n = (88/1+ 88 (0.05^2)$ is approximately equal to 72 units. The source indicated that most survey researches use a 95% confidence level and a±5% precision level.

Thus to carry out this research **72** foreign firms operating in the IP &IZ were considered to serve as a representative sample.

For the satisfaction of this research, the researcher carried out six in-depth interviews with six different groups who were believed to be appropriate persons to provide reliable information such as the government organs: Industrial parks development corporation (IPDC), Ethiopian Investment commission (EIC) and industry minister (IM), the administrators of foreign firms with in the industrial parks. The interviews are based on fundamentals of technology transfer& difficulties and challenges in the way of transferring technology.

3.6Data Collection Instrument

The researcher used personal interview and self-design questioner through open-ended and closed-ended questionnaires. Regarding to survey questioner the researcher developed based on Likert-Scale as the main mode of data collection. The uses of questionnaires were justified because it is affordable and effective way of collecting information from a population in a short period of time and at a reduced cost. The survey questionnaires also facilitate easier coding and analysis of data collections method. The closed ended questions ensure that the respondents are restricted to certain categories in their responses.

3.7Methods of Data Analysis

The response collected from the respondents with the questionnaire instrument was tested by using SPSS (version 22). The interview process was created a large amount of data. The immediate challenge, which were begin after the dictation of the very first interview, is to reduce the mass of text to something manageable and meaningful. For more practical purposes, delaying data analysis could create an unmanageable workload for the researcher (Glaser, 1992, p.39). The analysis of data in this study was done in three steps in the first step raw data are sorted and placed into conceptual categories. In the second step were make connections between the categories of raw data identified in relation with research questions. On the third and the last step a core category is identified and responses on the identified category are described.

Quantitative: All questions were individually analyzed, taking into considerations all the available factors and supported with descriptive statistics and an illustrative test was conductedto examine the relationship between selected variables, though the later was not the focused of this analytical study.

Qualitative: Qualitative data obtained from the open-ended questions through self-administered questionnaires, from the survey were analyzed by the researcher and the findings were presented and discussed under the various themes.

3.8 Ethical Issues

Ethical clearance and permission was obtained from each stakeholder respondents before the actual data collection process start.

Respondents were informed about the purpose of the study and the importance of their participation in the study. Participants were informed as they could skip question/s that they don't want to answer partially or fully and also to stop at any time if they want to do so. After assuring the confidentiality of the information was given for each respondent to obtaining informed consent from the participant, data collection was started with strict privacy.

CHAPTER FOUR

4 DATA PRESENTATIONS, DISCUSSIONS AND ANALYSIS

4.1 Introduction

This chapter presents the findings and results of the study on FDI firms role on technological transfer in Industrial Park & zone. Bygathering official information throughdistributed survey questioners and interviews with government officials and heads of the companies involved in this study the researcher draws conclusions concerning the research questions discussed above.

4.2 Response Rate of the Respondents

Table 4.1 reveals the general response rate and total share rate from total sampled (returned questioner) respondents in the study of Bole Lemi I industry park and Eastern Industry Zone. A total of 72 among them10 and 62 questionnaires were administered from Bole Lemi I industry park and Eastern Industry Zone respectively. While, 67 were collected and analyzed 8 and 59 from total sampled respondents of Bole Lemi I industry park and Eastern Industry Zone respectively. Five of the questionnaire were left with the respondent to fill but it is not returned. In another case the respondent was unavailable during collection of the questionnaire. As result, response rate of Bole Lemi I industry park and Eastern Industry Zone were 80% & 95.2% respectively. To sum up, the total response rate of the respondents is 93.1% and it is acceptable.

Table 4.1: Descriptive summary of respondents from selected Industry park & Zone.

Industrial Zone	Distributed questionnaire	Returned questionnaire	Response rate (%)	**Total sampled population (%)**
Bole Lemi I IP	10	8	80%	**11.9%**
Eastern IZ	62	59	95.2%	**88.1%**

Total	72	67	93.1%	**100.00%**

Source; own survey, 2018

Furthermore, Table 4.1 reveals share of the total sampled population held by the respondent within Industrial Park & Zone, for which the research was conducted on, 59 who represent (88.1%) of the total respondents work in Eastern Industry Zone, 8 respondents (11.9%) are in Bole Lemi I industry park. The sample taken from each industrial park & zone is computed by considering the total number of foreign companies operating in the industry park & zone

4.2.1 Background Profile of the Respondents

This section contains the general demographic profile of the employees (respondents) in terms of gender, education qualifications as well as working experience in the firm.

4.2.2 Educational qualification status of the respondents

Regarding to education qualification, 4.5% (3) of the respondents are Diploma holders working in Eastern Industry zone. Whereas 85.1% (57) of the respondents are Degree graduates and the remaining 10.4 % (7) of the respondents held Masters and above.This shows that there is good ground and readiness of the management and supervisors to coordinate and facilitate transfer of skill and technology.

Table 4.2: Descriptive summary of respondents Education Qualification status

Educational Qualifications	Diploma	3	4.5
	Degree	57	85.1
	Masters or above	7	10.4
	Total	67	100

Source: own survey 2018

4.2.3 Working Experiences of the Respondents

Table 4.3 below shows that 4.5 % (3) of the respondents have experience less than 2years and 23.9% (16) of the respondent's experience between 2 to 4 years, and 71.6 % (48) of respondents have experience above 4 years.

Table 4.3: Descriptive summary of respondents working experience

Relevant working experience (Years) in this firm	Less than 2Yrs	3	4.5
	between 2-4Yrs	16	23.9
	>4Yrs	48	71.6
	Total	67	100

Source; own survey, 2018

4.2.4 Types of Sectorial Investment

The samples used for analysis were selected from the total population of 67 foreign firms in Bole Lemi IP & Eastern IZ which are currently under business operation. The investments are of different types which are textile, electronic, garment, construction, cosmetics, metal, automobile assembly, spare part, packaging, plastic recycling, printing, food processing and cable manufacturing etc. In this study, the researcher could observe data from seven investment sectors describes in the table below.

As the Table 4.4 below shows most of (68.7%) the company invested in textile industry. 14.92 percent of firms invested in garment industry. The interview data also shows that, the knowhow and skill transfer in Industrial Parks are carried out massively in different fields especially in textile and garment sector. Unlike other sectors in bole lemi industry park and Eastern industry zone currently the sector is fully operated by local employees. It is one indicator of how these firms contribute for the improvement of know-how and knowledge of local employees.

Table 4.4: Sample foreign firms' types of investment category

Investment category	**Type of the Industry Zone**		**Total**
	Eastern	Bole Lemi I	
Textile	38(56.7%)	8(5.41%)	**46 (68.7%)**

Electronic	2(2.98%)	-	**2 (2.98%)**
Garment	10(14.92%)	-	**10 (14.92%)**
Cosmetics	1(1.5%)	-	**1 (1.49%)**
Spare part	1(1.5%)	-	**1 (1.49%)**
Packaging	3(4.45%)	-	**3 (4.45%)**
Construction materials	2(2.98)	-	**2 (2.98%)**
Cable manufacturing	2(2.98%)	-	**2 (2.98%)**
Total	59(88.1%)	8(11.9%)	**67 (100%)**

Source; own survey, 2018

4.3 Elements of data analysis

The data analysis is done in five sub headings with which the survey has been conducted targeting on the research aims and objectives. In each category major problems and achievements are discussed based on the findings from the interviews and questionnaires.

4.3.1 Foreign firms Technology Equipment's modernity status

The most important aspect of technology transfer is the nature of the technology. The more concrete the technology, i.e. the extent to which the technology is understandable, demonstrable and unambiguous, the greater the probability of success. Table 4.5 below describes about the firm's production equipment modernity and how firms timely update their equipment's and production process with the available latest technology and processes. Most of the respondents (92.5%) agreed that their firm's production equipment's and production processes are modern *(Mean=4.6, St. deviation=0.836)* in comparison with available processes and technologies in

the developed world. In addition to this (80.1%) of firms agreed that they timely replace/update their existing production equipment's by importing new technology *(Mean=4.22, St. deviation=1.098).*

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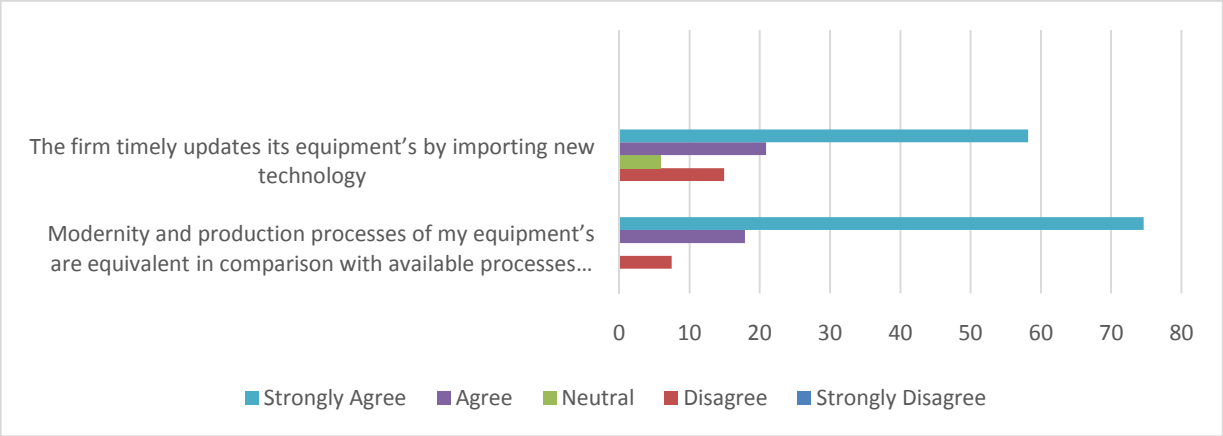

Regarding the production capacity of the firms in connection with systematic production process and technological equipment based on the questionnaire response 91% disagree and 9% strongly disagree reveals that no any firm underutilized its production capacity due to lack of necessary and available modern equipment under normal circumstance *(Mean=1.91, St. deviation=0.288).*

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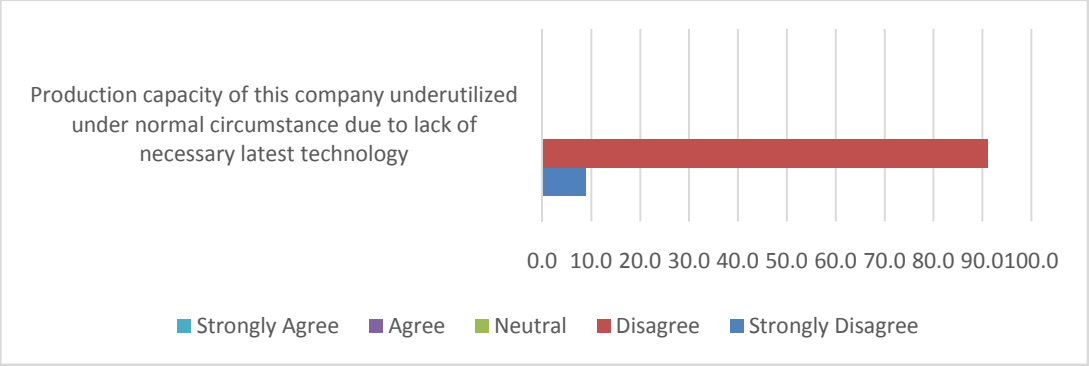

This issue is witnessed by the interview data. The interview data reveals that, majority of the firms operated in industry park and zones produce for export market. The export market by its nature needs more standard and quality products to be competent. Thus, to produce more standard and quality products the firms used modern production system and modern technological production equipment's. The problem in connection with importing of high tech machineries is lack of skilled and well trained local professional/technician. When this kind of problem occurs foreign firms hire foreigner professional for a maximum period of three years and replace the foreign personnel by local personnel after delivering required proficiency skill. The EIC controls the replacement of repatriate employee by local professional by denying residence and work permit longer than three years. From the above analysis it is noted that foreign firms in industry park and zone serve as a potential source for technology transfer by availing latest and modern technological production equipment and production process.

Table 4.5: Modernity status of production equipment's

Items Related to Status of Technology Equipment		**Response of participants**	
		Frequency	**Percent**
Modernity and production processes of my equipment's are equivalent in comparison with available processes and technologies in the developed world	Disagree	5	7.5
	Agree	12	17.9
	Strongly Agree	50	74.6
	Total	67	100
The firm timely updates its equipment's by importing new technology	Disagree	10	14.9
	Neutral	4	6.0
	Agree	14	20.9
	Strongly Agree	39	58.2
	Total	67	100
Production capacity of this company underutilized under normal circumstance due to lack of necessary latest technology	Strongly Disagree	6	9.0
	Disagree	61	91.0
	Total	67	100

Source; own survey, 2018

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Dev.
The modernity and production processes of my equipment's are equivalent in comparison with available processes and technologies in the developed world?	67	2	5	4.60	.836

The firm timely updates its equipment's by importing new technology	67	2	5	4.22	1.098
The production capacity of this company underutilized under normal circumstance due to lack of necessary latest technology	67	1	2	1.91	.288

4.3.2 Policies and Incentives

On table 4.6below, the influence of policies, technical and economic incentives available in particular to firms that have the potential to make critical and major contributions to technology transfer has been assessed. Policies and laws influence firms to contribute for technology transfer to create conducive conditions. Foreign firms included in this research found in bole lemi industry park and Eastern industry zone were asked about, how their firm be influenced by policies and laws for technology transfer. Among the respondents 74.1 of respondents agreed that they are influenced by policies and laws to transfer technology for local personnel's *(Mean=4.95, St. deviation=0.990)*while all (100%) of the respondents disagree that they are not influenced by policies and lows to transfer technology to local firms *(Mean=2.54, St. deviation=0.893)*.

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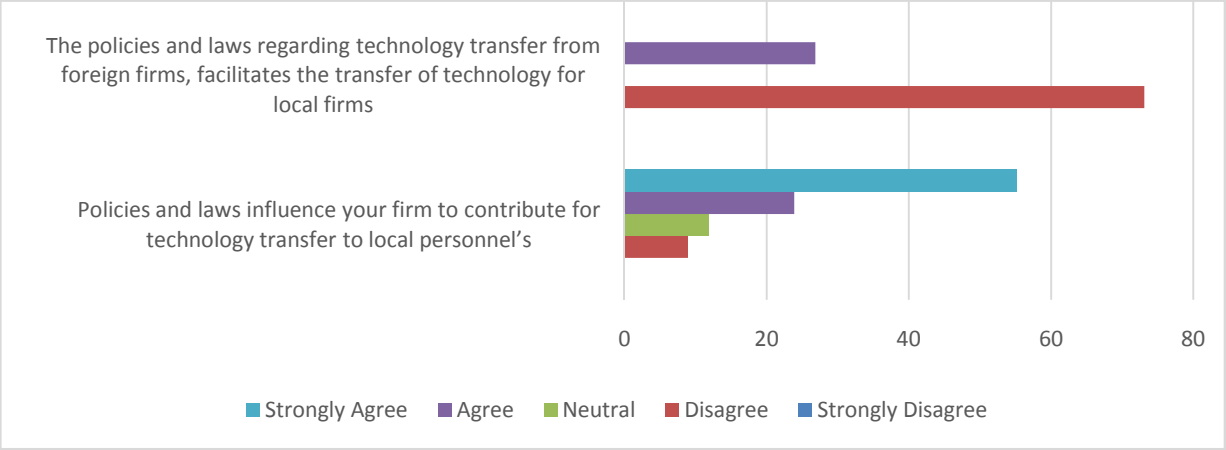

From the above questionnaire response, it is noted that policies and laws influence foreign firms to transfer technology for local employees. Technology transfer at employee level is mandatory, at the same time technology transfer from foreign firms to local firms is critical, in this regard the survey analysis shows that the technology policies and laws should have to incorporate firm to firm technology transfer agreement.

Regarding incentives 73.1% of the respondent argued that the technical and economic incentives are not encouraging *(Mean=2.18, St. deviation=0.869)*; 10.4% respond the incentive is encouraging.

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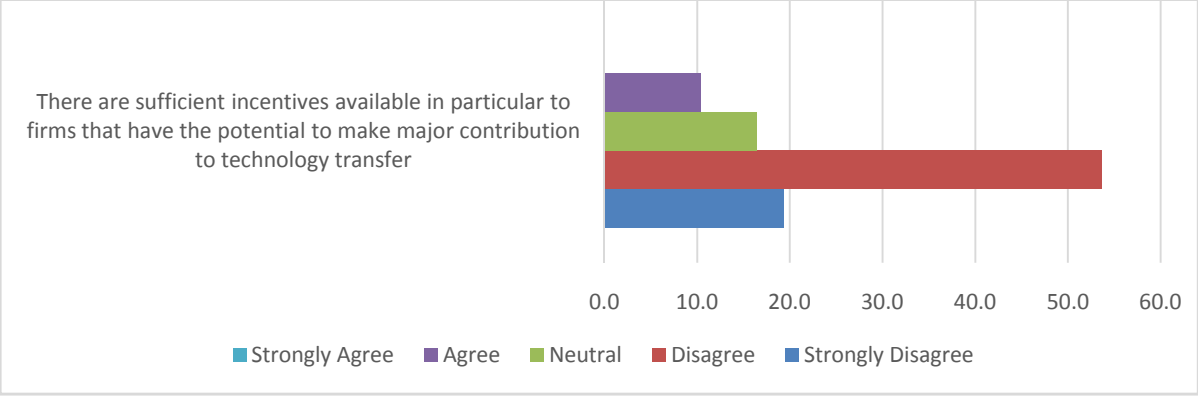

The result shows that the incentives are not that much encouraging for foreign firms to make critical and major contributions to transfer technology to the country. Most of the respondents argue that the government should focus and give incentives for high technology investments rather than less technological intensive sectors like agriculture and food processing industries.

Table 4.6: Influence of policies and incentives for Technology Transfer

Items related with Policies and Incentives		**Response of participants**	
		Frequency	Percent
Policies and laws influence your firm to contribute for technology transfer to local personnel's	Disagree	6	9.0
	Neutral	8	11.9
	Agree	16	23.9
	Strongly Agree	37	55.2
	Total	67	100
The policies and laws regarding technology transfer from foreign firms, facilitates the transfer of technology for local firms	Disagree	49	73.1
	Agree	18	26.9
	Total	67	100
There are sufficient incentives available in	Strongly Disagree	13	19.4

particular to firms that have the potential to make major contribution to technology transfer	Disagree	36	53.7
	Neutral	11	16.4
	Agree	7	10.4
	Total	67	100

Source; own survey, 2018

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Dev.
Policies and laws influence my firm to contribute for technology transfer to local personnel's	67	2	5	4.25	.990
Policies and laws regarding technology transfer from foreign firms, facilitates the transfer of technology for local firms	67	2	4	2.54	.893
There are sufficient incentives available in particular to firms that have the potential to make major contribution to technology transfer	67	1	4	2.18	.869

4.3.3 Level of foreign firm's cooperation, linkage and collaboration with local firms &institutions

(A)Cooperation Agreement

Foreign firms can diffuse technology to domestic firms, suppliers, vendors, customers and entities with whom they have direct and indirect relation. In particular, backward linkages between foreign firms and domestic firms are important for enhancing technology dissemination. Table 4.7 describes the level of collaboration of foreign firms in bole lemi industry park and eastern industry zone. From the survey response 38% of the respondents have a detail technology transfer cooperation agreement *(Mean=2.85, St. deviation=1.145)* while 52.3% of the respondents responded that they have not a detail cooperation agreement. From the above survey questionnaire response, it is noted that more than half of foreign firms have not signed a binding cooperation agreement.

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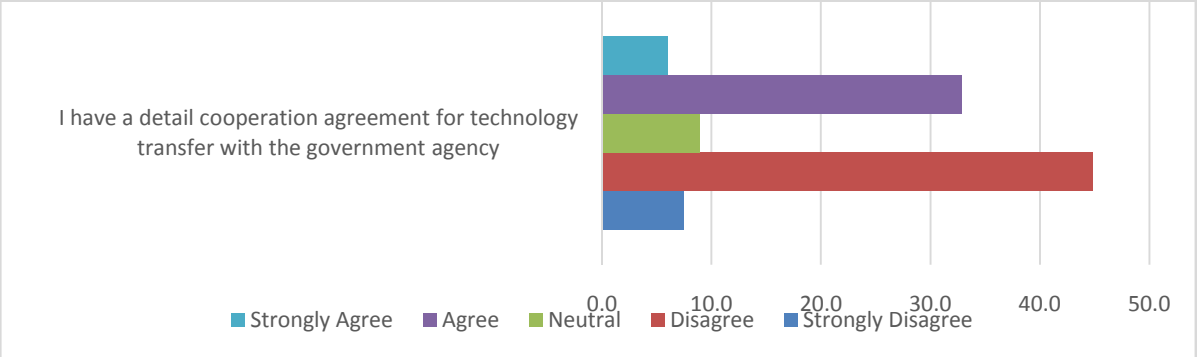

Detail technology transfer agreement that binds foreign firms especially high-tech foreign firms is basic and mandatory that constitutes in detail about technology transfer conditions & how, where, when issues should be defined in detail. Without detail cooperation agreement it is very difficult to evaluate and control the level of contribution of foreign firms impact for technology transfer.

(B) Linkage of firms through supply and procurement

Among different technology transfer mechanisms, Linking and associating local firms with foreign firms through supply of raw materials and production inputs by local firms is one method which potentially contributes for technology transfer activity. In this regard the conducted survey analysis shows that 53.7% of the respondents agreed that they procure production inputs and raw materials from local manufacturers and suppliers *(Mean=3.40, St. deviation=1.360)*. On the other hand, 46.3% of the respondents argued that their production input and raw materials is not procuring from local suppliers.

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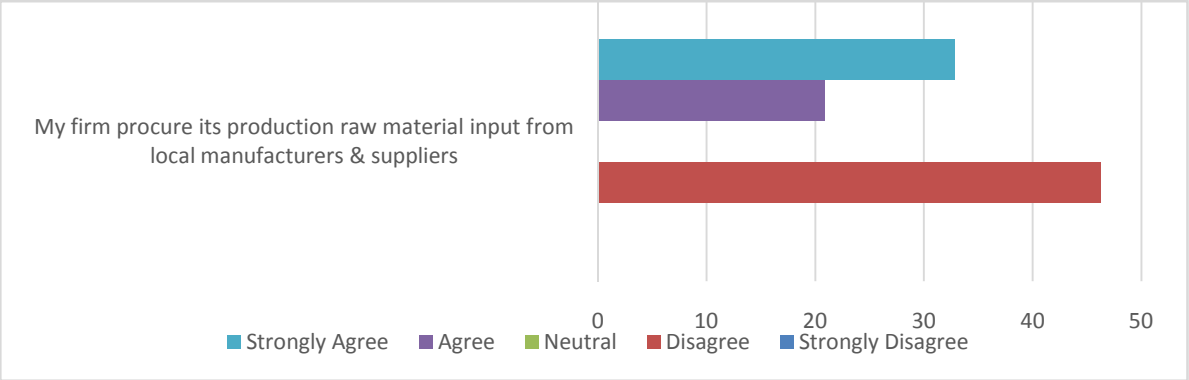

The response rate of respondents shows that almost half of foreign firms operated in the selected industrial park and zone procure their production inputs and raw materials from local suppliers. This topic is witnessed by the interview response from heads of foreign firms operated in the industry park and zone. Linking and associating foreign and local firms through procurement and supply, potentially contributes for technology transfer, because foreign firms demand of raw material and production is supplied as per their specification and quality standard. To meet their standard and quality raw material and production input demand these firms can train, and provide technical support to local supplier firms. 43.3% of respondents agreed that they support local suppliers with the intention of helping them to improve their operation by the transfer of technology through design and process know-how *(Mean=3.30, St. deviation=0.697)*.

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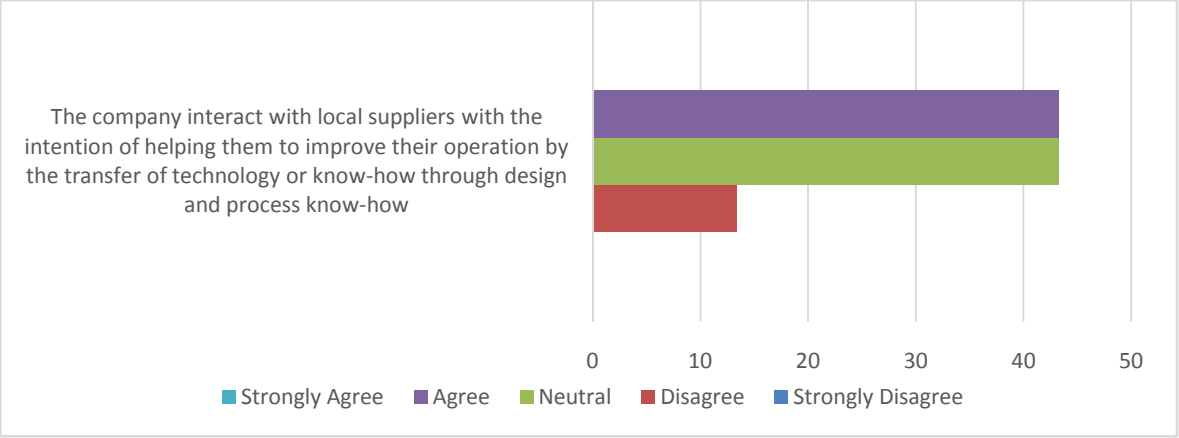
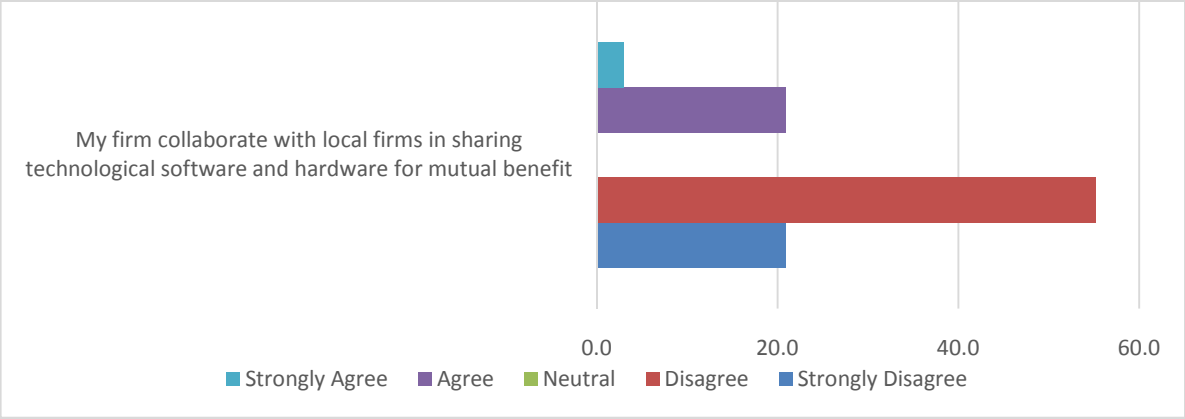


Collaboration of foreign firms with local firm's on sharing technological software and hardware is very limited. The survey result shows that only 23.9% of respondents are agreed that they share technological hardware and software *(Mean=2.30, St. deviation=1.115)* while majority 76.1% of the respondents are argued that they are not sharing technological hardware and software.



In general, the level of collaboration between foreign and local firms in sharingtechnological software and hardware is limited*(Mean=2.30, St. deviation=1.115)*.From the respondent most of the reasons for these are:

- **Lack of trust between firms**

  Companies involved with the same product production compete for market share. To win the market one of the strategy is making confidential the product design, production system and technology as much as possible.

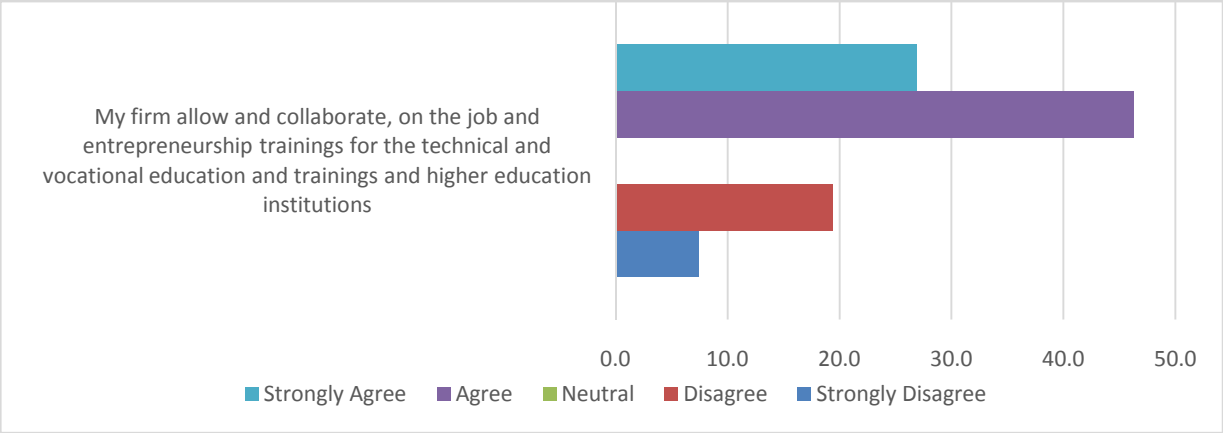
- **Cultural difference between foreign and local investors**

  Investment habit, risk acceptance level, mode of production, international competitiveness, level of knowledge, technology & other issues are differences between local and foreign investors.

(C) Linkage of foreign firms with higher learning institutions

The other most important and critical factor for technology transfer is associating and linking these foreign firms with higher learning institutions through research & development, apprenticeship and on the job training. With this regard the conducted survey analysis shows that 73.1% of the respondents are willing to accept apprenticeship and on the job training from higher

institutions *(Mean=3.66, St. deviation=1.274)*while 26.9% of the respondents argued that they are not ready and willing to accept learners from higher institutions.



From the above collected survey data majority of the firms are willing to accept entrepreneurship and on the job training while some few firms are not interested. The main reason for them is:

- Nature of the firm's production system flow
- Fear of loss of damage

Table 4.7: Level of collaboration of foreign firms with local entities

Items Related to Level of linkage and collaboration		**Response of participants**	
		Frequency	Percent
I have a detail cooperation agreement for technology transfer with the government agency	Strongly Disagree	5	7.5
	Disagree	30	44.8
	Neutral	6	9.0
	Agree	22	32.8
	Strongly Agree	4	6.0
	Total	67	100
My firm procure its production raw material input from local manufacturers & suppliers	Disagree	31	46.3
	Agree	14	20.9
	Strongly Agree	22	32.8
	Total	67	100
The company interact with local suppliers with the intention of helping them to improve their operation by the transfer of technology or know-how through design and process know-how	Disagree	9	13.4
	Neutral	29	43.3
	Agree	29	43.3
	Total	67	100

My firm collaborate with local firms in sharing technological software and hardware for mutual benefit	Strongly Disagree	14	20.9
	Disagree	37	55.2
	Agree	14	20.9
	Strongly Agree	2	3.0
	Total	67	100
My firm allow and collaborate, on the job and entrepreneurship trainings for the technical and vocational education and trainings and higher education institutions	Strongly Disagree	5	7.5
	Disagree	13	19.4
	Agree	31	46.3
	Strongly Agree	18	26.9
	Total	67	100

Source; own survey, 2018

Descriptive Statistics

	N	Min.	Max.	Mean	Std. Dev.
I have a detail cooperation agreement for technology transfer with the government agency	67	1	5	2.85	1.145
My firm procure its production raw material input from local manufacturers & suppliers	67	2	5	3.40	1.360
The company interact with local suppliers with the intention of helping them to improve their operation by the transfer of technology or know-how through design and process know-how	67	2	4	3.30	.697
My firm collaborate with local firms in sharing technological software and hardware for mutual benefit	67	1	5	2.30	1.115
My firm allow and collaborate, on the job and entrepreneurship trainings for the technical and vocational education and trainings and higher education institutions	67	1	5	3.66	1.274

4.3.4 Local Technological Status

(A) Local capability to improve imported technology

Technological capability of a firm is the capacity to deploy resources, usually incombination, using organizational processes, to achieve a desired end. Thetransfer and diffusion of technology

is crucial to build domestic technological capabilities; and the role of Government in supporting this process, as well as in building on it to develop and enhance national innovation system is fundamental. Different researchers argued that even if the number and technological capability of the foreign industries are high; the local personnel should have technological capability to adopt and diffuse technology from these firms. In this regard the conducted survey analysis about local technological capability to absorb, improve and emit the once transferred technology shows that 35.9% of the respondents are agreed that there is local technological capability to absorb and improve the transferred technology while 55.2% of the respondents argued that the local technological capability to absorb and improve the transferred technology is Weak *(Mean=2.67, St. deviation=1.330).*

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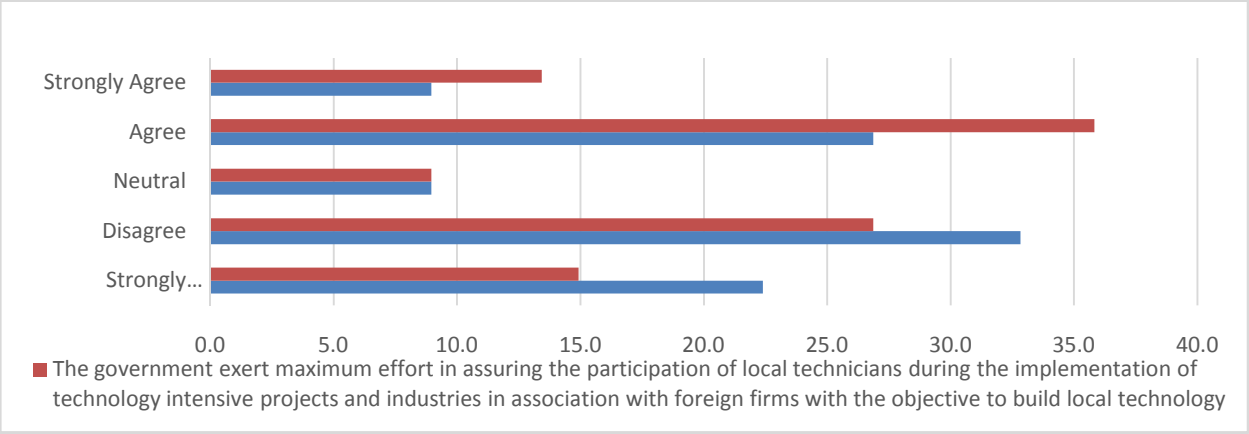

The result indicates that local companies have the capability to use imported technology but the effort of improvement of the technology is very weak. Thus to transfer a given technology local firms must adopt, absorb and improve technologies from abroad which fills the technological gap between foreign and localcompanies.

(B) Participation of local professionals during high-tech project implementation

The government is an important contributor in transfer of technology to local companies. In this regard the government's effort in assuring participation of local technicians during implementation of technology intensive projects and industries in association with foreign firms has been assessed.

The response from the conducted survey analysis indicates 49.2% of respondents agreed that there is government participation through local technicians during implementation stage. while

41.8% of respondents argued that there is no local technician's participation during implementation stage *(Mean=3.06, St. deviation=1.336).*

The result reveals that the local technician's participation during project implementation by foreign firms is weak. The interview data shows the reason for this is the government does not provide information about the implemented projects touniversities and other institutions and also after awarding an investment thegovernment does notfollow the implementation process closely.

Table 4.8: Level of local technological capability

		Frequency	Percent
There is local's technological capability to absorb, improve and emit the once transferred technology	Strongly Disagree	15	22.4
	Disagree	22	32.8
	Neutral	6	9.0
	Agree	18	26.9
	Strongly Agree	6	9.0
	Total	67	100
The government exert maximum effort in assuring the participation of local technicians during the implementation of technology intensive projects and industries in association with foreign firms with the objective to build local technology	Strongly Disagree	10	14.9
	Disagree	18	26.9
	Neutral	6	9.0
	Agree	24	35.8
	Strongly Agree	9	13.4
	Total	67	100

Source; own survey, 2018

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Dev.
There is local's technological capability to absorb, improve and emit the once transferred technology	67	1	5	2.67	1.330
The government exert maximum effort in assuring the participation of local technicians during the implementation of technology intensive projects and industries in association with foreign firms with the objective to build local technology	67	1	5	3.06	1.336

4.3.5 Personnel development

(A) Replacement of foreign personnel by local professionals

Foreign firms allowed to hire foreign citizen for jobs which require special skill, technical proficiency and higher qualification that didn't filled by local professionals for a maximum of three years, unless approval is obtained to extend contract of employment from E.I.C. The firm should replace expatriate personnel or professional by Ethiopian nationals after transferring required knowledge and skills through specialized trainings. With regard to this the conducted survey analysis shows that 91% of respondents agree that they timely replace expatriate personnel's by transferring required skill and trainings to local employees*(Mean=4.46, St. deviation=0.893)*while 9% of respondents agreed that they are not timely replace expatriate employees by Ethiopians.

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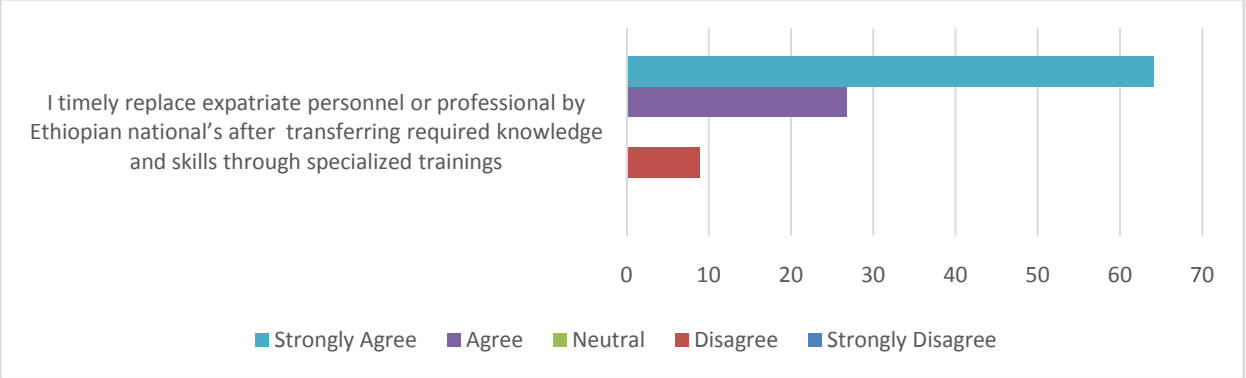
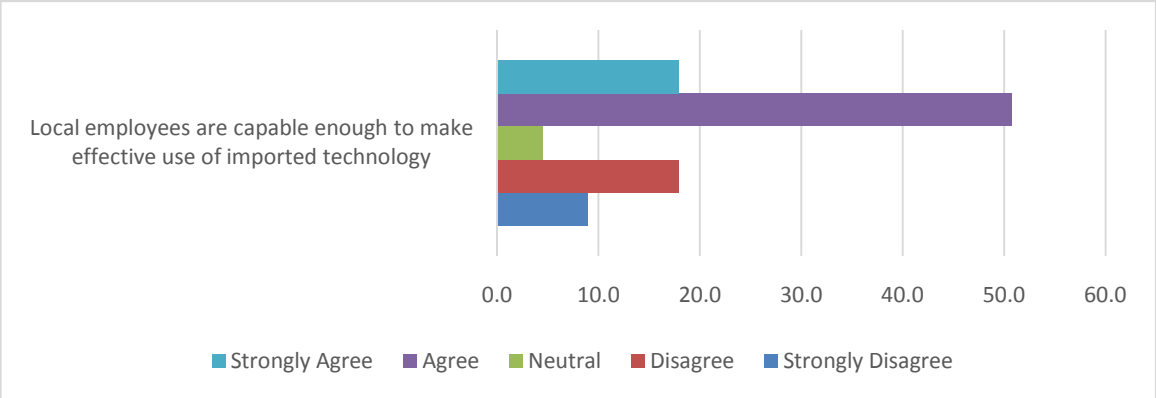


From this data it is understood that with in a very short period of time the local personnel own the required skill and proficiency level to take over the task from foreigners. According to Dana &Snejina (2004), the more foreign firms uses expatriate for temporary assignments (Assignment less than a year), the greater the expatriates" ability to transfer knowledge while the more the foreign firms uses expatriate for long-term assignment s, the greater the willingness to transfer knowledge.Haris (2002) argued that, expatriates" with long-term assignment remain critical for

skill transfer, management control and management developments while expatriate with temporary assignment are used mainly for skill transfer.

(B) Usage of technology

The effectiveness of technological capability of local personnel's on using imported technology in the selected foreign firms have been assessed from the collected data presented on table 4.7 below. From the respondents 68.8% are agreed that their firm's local personnel's effectively use the imported technology while 26.9% of respondents argued that their firm local personnel's are not in a position to use the imported technology effectively.



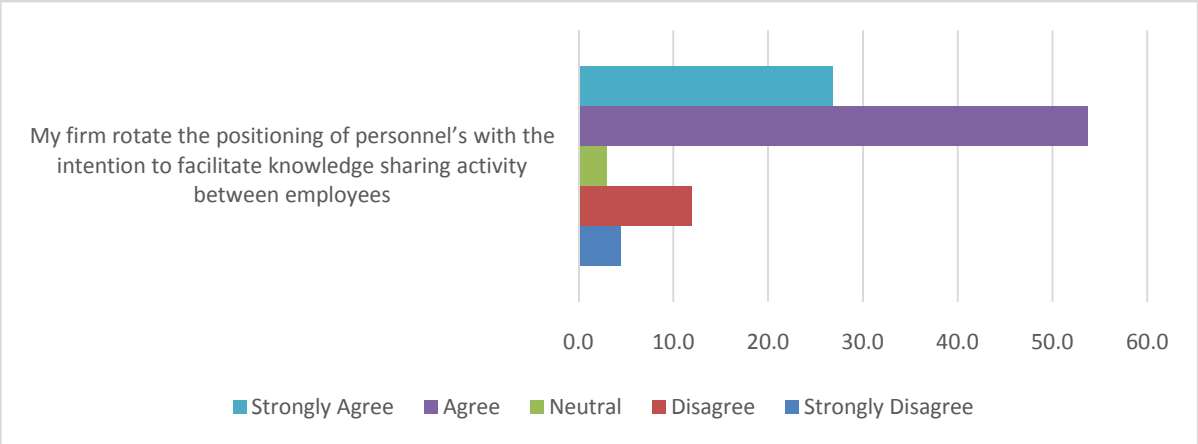
From the above result it is noted that majority of local personnel's hired in foreign firms effectively run the operation by using imported machineries and technology equipment's. Parallel to this Employees of foreign firm flexibility to adopt the changing nature of product and service have been assessed. The conducted survey analysis shows that 73.2% of respondents are either agree or strongly agree about flexibility of their employees to adopt the changing nature of products and services, while 26.8% of respondents are argued about the flexibility of their employees to adopt the changing nature of product and service *(Mean=3.57, St. deviation=1.282)*.

(C) Rotation of personnel between departments

Thirdly, one of the most effective way of transferring technology within a company is the transfer of personnel between different departments. This means their frequent change of either

position or location within companies brings new knowledge into different departments. According to Jespersson (2008) the communication is stimulated, when these new employees with certain experience change their working environment and start working with new colleagues. Especially in the first few months, the employees have increased interest in the knowledge and experiences, their new fellow workers gained in other parts of the company and therefore the knowledge transfer is stimulated.

In this regard, Table 4.8 reveals that there is frequency of change of either position or location of employees within foreign firms operated in the industry park & zone. The analysis shows that 80.6% of the respondents are either agreed or strongly agreed while only 16.4% of respondents argued that there is no rotation of employees between departments *(Mean=3.87, St. deviation=1.086)*.



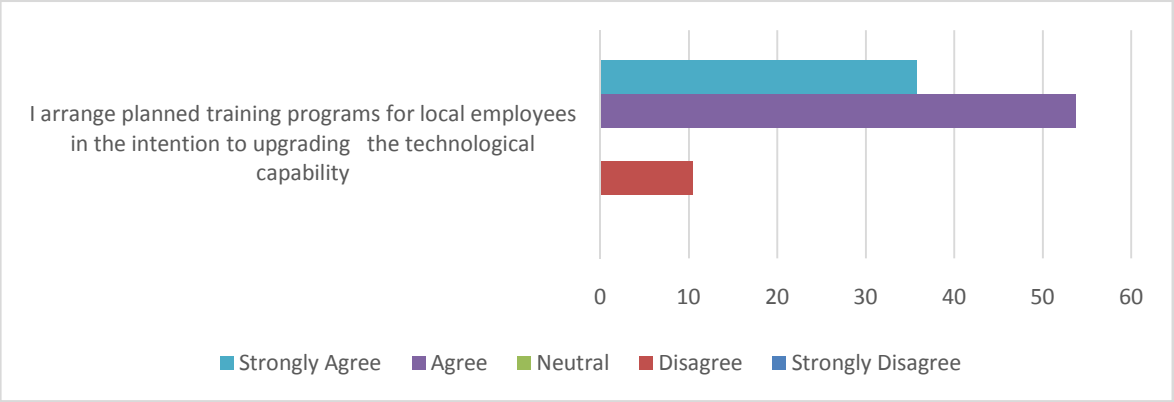
From the above analysis it is understood that there is a good atmosphere for employees to experience new technology and production process periodically through rotation and reshuffling of employees between different departments.

(D) Provision of training

The technological knowledge transfer is carried out in a more formal way within firms when planned training sessions are held. In such events experienced personnel of the firm try to share

and transfer their expertise on a certain topic to their colleagues. This happens during seminars, practical mentoring sessions or similar activities. Especially for companies where more people work on similar issues and therefore need analogous knowledge, positive effects on the productivity are likely. For example, Jespersson (2008) reported that Bit Sim uses such training courses for internal purpose quite satisfactory to spread their specific technological knowledge within the company.

In Table 4.9 below shows that the practices and extent of sharing and transferring of technological knowledge through planned training sessions in selected foreign firms. In these situations, most of the respondents 89.5% replied either agreed or strongly agreed and are likely perceived such practices is common within foreign firms in order to enhancing and transferring the technology knowledge*(Mean=4.15, St. deviation=0.875)*.



As a result, planned training sessions and similar activities take place within the examined firms in the Industrial Parks and zone thus, they are likely to be perceived as one mechanism of technological knowledge transfer enhancing activities within foreign firms.

(E) Contribution of Labor Turnover for Technology Transfer

One of the most common and least expensive ways by which foreign technology gets diffused in host countries is through labor turnover, as domestic employees (especially employees in higher level positions) move from foreign firms to domestic firms.Knowledge and technology spillovers can take place through mobility of labor in which local technicians and professionals leave foreign firms and switch to local firms or established their own companies.

With this regard the survey indicates that around 26.1% of respondents replied that there exists transfer of staffs from foreign firm to local firms. This shows that not less number ofexperienced personnel mobility from foreign to local firm exhaustively facilitates the flow of technology. In contrast to this the degree of transfer of staff from other identical firm to foreign firm is large in number compared with staff mobility from foreign firms to local firms. The survey analysis shows that 44.8 % responded that they hire employees from other similar firm with the intention to know the working knowhow of the other firm.

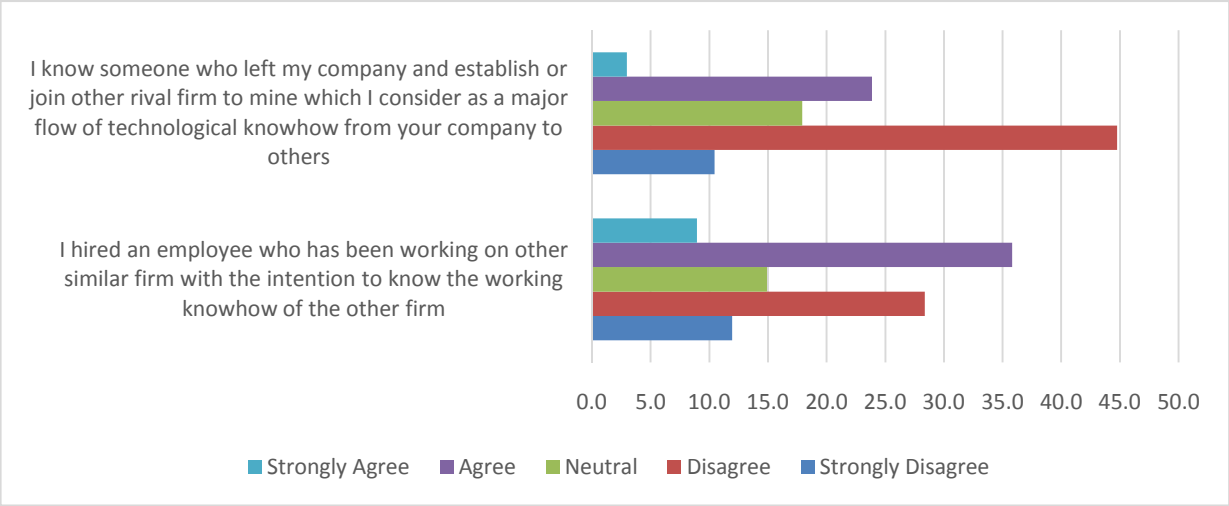


Table 4.9: personnel Development

personnel Development		Frequency	Percent
I timely replace expatriate personnel or professional by Ethiopian national's after transferring required knowledge and skills through specialized trainings	Disagree	6	9.0
	Agree	18	26.9
	Strongly Agree	43	64.2
	Total	67	100
Local employees are capable enough to make effective use of imported technology	Strongly Disagree	6	9.0
	Disagree	12	17.9

	Neutral	3	4.5
	Agree	34	50.7
	Strongly Agree	12	17.9
	Total	67	100
Employees of my firm are flexibility to adopt the changing nature of product and service	Strongly Disagree	7	10.4
	Disagree	11	16.4
	Agree	35	52.2
	Strongly Agree	14	20.9
	Total	67	100
My firm rotate the positioning of personnel's with the intention to facilitate knowledge sharing activity between employees	Strongly Disagree	3	4.5
	Disagree	8	11.9
	Neutral	2	3.0
	Agree	36	53.7
	Strongly Agree	18	26.9
	Total	67	100
I arrange planned training programs for local employees in the intention to upgrading the technological capability	Disagree	7	10.4
	Agree	36	53.7
	Strongly Agree	24	35.8
	Total	67	100
I hired an employee who has been working on other similar firm with the intention to know the working knowhow of the other firm	Strongly Disagree	8	11.9
	Disagree	19	28.4
	Neutral	10	14.9
	Agree	24	35.8
	Strongly Agree	6	9.0
	Total	67	100
I know someone who left my firm and establish or join other rival firm to mine which I consider as a major flow of technological knowhow from your company to others	Strongly Disagree	7	10.4
	Disagree	30	44.8
	Neutral	12	17.9
	Agree	16	23.9
	Strongly Agree	2	3.0
	Total	67	100

Source; own survey, 2018

Descriptive Statistics

	N	Min.	Max.	Mean	Std. Dev.
I timely replace expatriate personnel or professional by Ethiopian national's after transferring required knowledge and skills through specialized trainings	67	2	5	4.46	.893
Local employees are capable enough to make effective use of imported technology	67	1	5	3.51	1.235

Employees of my firm are flexibility to adopt the changing nature of product and service	67	1	5	3.57	1.282
My firm rotate the positioning of personnel's with the intention to facilitate knowledge sharing activity between employees	67	1	5	3.87	1.086
I arrange planned training programs for local employees in the intention to upgrading the technological capability	67	2	5	4.15	.875
I hired an employee who has been working on other similar firm with the intention to know the working knowhow of the other firm	67	1	5	3.01	1.225
I know someone who left my company and establish or join other rival firm to mine which I consider as a major flow of technological knowhow from your company to others	67	1	5	2.64	1.055

4.5 Research & Development

The conducted survey analysis shown on table 4.10 below, reveals that 26.9 % of firm's agreed that they carryout research and development activity. While 73.1% respondents revealed that they didn't carryout research and development activity. Among the firms that have research and development department 88.9% of the respondents agreed the relevancy of the outcome of the research & development activity.

Table 4.10: Research & Development

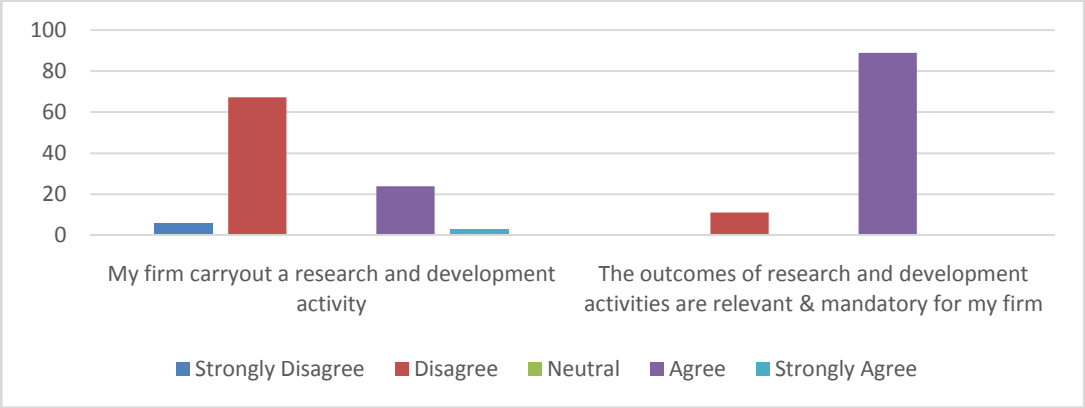
		Frequency	Percent
My firm carryout a research and development activity	Strongly Disagree	4	6.0
	Disagree	45	67.2
	Agree	16	23.9
	Strongly Agree	2	3.0
	Total	67	100
The outcomes of research and development activities are relevant & mandatory for my firm	disagree	2	11.1
	Strongly Agree	16	88.9
	Total	18	100

Source; own survey, 2018

Descriptive Statistics

	N	Min.	Max.	Mean	Std. Dev.
My firm carryout a research and development activity	67	1	5	2.51	1.021
The outcomes of research and development activities are relevant & mandatory for my firm	18	2	4	4.22	1.231

Graphical Description



4.4 Summary ofInterview Data& Result

The interview data shows that, the main reason for the construction of Industrial parks is to ease the bureaucratic process for foreign investors to curve the problems/challenges that the investors faced to involve in the investment activity. Formerly the investor is required to have investment license, arrange lease agreement for land, then engaged on construction, &arrange other infrastructures like, water, electricity, & telecom facility. In addition to these the investor also requires additional go/t services, Customs &bank for import/export. To gain all these facilities the investor goes to many offices. By considering these facts constructing the shades in industrial parks taken as a mechanism to attract foreign investors, and to settle their additional burdens in connection with infrastructure needs and easing the bureaucratic process starting from giving license up to day to day follow up and regular service on the one stop shop service. The one stop shop service is provided by all the industry parks for the firms located in the industry parks which facilitate all the bureaucratic services needed by the firms.

The contribution of FDI firms for technology transfer in the case of "Bole Lemi Industry Park" and "Eastern Industry Zone"

Regarding control of technology transfer activity, Ministry of industry regulated the activity by assigned personnel in the industry parks to facilitate and control the activity of foreign firms to improve the knowhow and technology knowledge of local employees in the industrial Parks. The knowhow and skill transfer in Industrial Parks are carried out massively in different fields especially in garment sector which is currently fully operated by local employees. It is one indicator of how these firms contribute for the improvement of knowhow and knowledge of local employees. According to the interview data, previously there were no experience of developing Industrial Parks in the country; for the first time, it was a big challenge for the corporation (IPDC) how to develop industrial parks. The information and knowledge was limited how to construction of the shades and linking the infrastructure facilities.

Regarding new technology in industrial parks, the firms in industrial parks introduced much new technology (state of the art technology) like, the garment industry. Firms engaged in industrial parks are expected to export for foreign market. The export market before all requires standard products. These firms should use modern technology and process to be competent in the export market. So to be competent these firms deploy modern technological equipment's.

In technology transfer process Ethiopian investment commission controls each investor in the industry park &zone to replace expatriate foreign technicians and professional to be replaced by local technicians after delivering the required training with in three years. The controlling mechanism by EIC is denying of work permit and resident permit for foreign employees who want to stay more than three years unless, if there is strong justifiable reason. The investor in the industry park is expected to train local technicians and professional with in the period of three years.

4.4.1 Summary of results

From the previously presented and discussed analysis with regard to contributing condition of foreign firms, the following points can be considered as the major findings from the interview and questionnaires.

- There is staff turnover from foreign firms to local firms and in contrast staff migration between identical foreign firms exist in IZ & IP.
- During the time of implementation of high technology intensive projects, the role of the government commitment on assigning local professionals and technicians with the intention to learn from the scratch is very limited.
- The cooperation, collaboration and linkage between foreign firms and local firms is not as such attractive.
- The local personnel's technological capability to use imported technology is very god, while the local personnel's technological capability to modify, improve of emit the imported technology is very weak.
- The availability of foreign firms is very important which serve as a source of potential technology transfer method through different methods:
  - Introduction of modern technology
  - Introduction of modern process system
- The technical and economic incentives available in particular to foreign firms that have the potential to make major contributions to technology transfer are not encouraging.

4.5 Proposed solution and policy implication

4.5.1 Proposed solution

To ensure effective technology transfer from foreign firms the following points may serve as the basic building blocks for the establishment of a conducive factors:

Linking local firms and learning institutions with foreign firms

- Establishment of cooperation and linkage between foreign and domestic firms and learning institutions are among the key modes of transmission of know-how and technology. The acquisition of technology from foreign firms to local ones is based on, the degree and the speed, depends on the type, scale and quality of the interface that exists between the firms. Linkage between foreign firms and domestic suppliers could involve intensive consultation, training and technology transfer between foreign firms and potential domestic suppliers through design specifications and process improvement.

Continuous & sustained Improvement of the capacity of local supplier

- The other effective way of improving levels of technology particularly in local firms is to link locally owned supplier firms with foreign firms. In this regard the government should have to facilitate continuous Local capacity development Program and enter into contractual relationships with foreign firms to transfer experienced technical and managerial employees to local firms.

Provision of technical and economic incentives for high tech foreign firms

- Firms, particularly foreign firms that have big potential to make critical and major contributions for technology transfer should have to be compensated through the provision of technical and economic incentives.

Attracting foreign investors in specific sectors

- The governments need to target and work the promotion of high-technology investments which potentially relevant for the contribution of technology knowhow in the development strategy. Government can seek to attract foreign firms into these investments, by using fiscal or financial incentives. The incentives may include availing investors needs like, (infrastructure, one window service, skilled man power, and so on).

4.5.2 Policy implication

Ethiopia has been demonstrating significant commitment in expanding industrial parks that would facilitate proper environment for Foreign Direct Investment. Technology transfer is the one among many benefits of foreign direct investment.

However, foreign firm's contribution for the flow of technology in IP & IZ is limited in few parameters. In this regard foreign firms operated in industrial park & zone highly contribute for technology knowledge flow by creating conducive conditions for local personnel's like, importing and introducing modern technological equipment's and production process, provision of scheduled training, periodic reshuffling of employees from department to department. At the same time these firms provide trained and skilled man power for local firms through staff migration &staff turnover. While, the collaboration and linkage between foreign firms with local firms and institutions is very weak. In this regard, how to link foreign firms with local firms and how to exploit their potential to the local firms is challenging and needs a thorough analysis.

The following supposed policies could help the government to create suitable environment for technology transfer and to change the current situation:

Bind foreign firms with pre-arranged partnership agreement to cooperate with local firms and institutions

- Technology transfer would be effective if and only if when there is a high level of collaboration between foreign firms with local firms and institutions. This would be more effective when there exists a detail cooperation agreement between the first contact party (government) enters in to agreement with the foreign firm how, when, where, to whom and at what condition to transmit technology knowledge should be defined in a clear manner

Ensure participation of local technicians and professionals in high tech-firms starting from project/plant implementation stage

- The government should ensure the participation of local technicians and professionals during the time of implementation of new projects to gather new knowledge and skill starting from the plant initial phase up to the last step of production.

Provide technical and economic incentives for firms that have big potential for technology transfer

- Technical and economic incentives should be considered as a motivation factor for firms to transmit technology, thus the government have to motivate potential firms by providing economic and other technical incentives to cooperate with local firms and institutions as a less expensive means of technology transfer method.

Associate foreign firms with local firms through joint venture

- The government should identify and give priority or incentives for joint venture and high technology investments to improve local firm's capacity. When there exists a joint venture agreement between firms, there is a commitment of resources by both partners to achieve pre-set goals. By doing this local firms obtain latest production technology, managerial skill and process know how from foreign partner.

CHAPTER FIVE

5 CONCLUSIONS AND RECOMMENDATIONS

The previous chapter presented the result and analysis of the study. This chapter provides the conclusions and recommendations in line with the findings of the study. The chapter is structured in to two sections. The first section deals with the conclusion whereas the second section presents some recommendation and suggested as a solution to problem which is identified in the study

5.1 Conclusion

In general, one can say that Industry Parks & zones seem to offer a good and favorable environment for technology transfer. Some scholars argue that foreign firm's trough FDIcan also facilitate technology transfer to hosting countries. The magnitudeof spillover effects offoreign firms for technology transfer depends on absorptive capacity of the hosting country firms and other factors like human capital, policies and laws. In other word, thesize of effective spillovers depends on the extent to which domestic firms respond positivelyto factors such as technology gap and human capital.

To compile this paper an attempt has been made to obtain information from government agencies and foreign firms found in IP & IZ via direct contact and distributing questionnaires. The findings have beendiscussed, analyzed and presented in the previous chapters.

This paper evaluates the contribution of foreign firms in IP & IZ for technology transfer.From the experience of the leading developing countries, their currentdevelopment comes from applying different FDI strategies and policies in selected sectors. Ineffect it develops the local technological capability. From the survey analysis it is noted that most of the foreign companiesare engaged in labor intensive production system and also the collaboration offoreign firms with local firms & institutions isvery weak in the intention to transfer technological knowhow.

In addition, the government has an important enabling role in determiningtechnology transfer to local firms by linking domestic manufacturing enterprises with foreign firms in industrial park & industrial zones in order to develop their technological capacity and to benefit them from international market.

5.2Recommendation

Based on the overall analysis, the following recommendation has been made for the improvement of technology transfer fromFDI firms in Industrial Park& zone.

- The government should provide technical and economic incentives, in particular to foreign firms in the IP& IZ for those firms that have the potential to make major contributions to technology transfer to the country.

- Improve the government participation and partnership with universities and research & development project for the progress of knowledge transfer. University and R&D project need to well-funded by government to strengthen the relationship between universities and foreign firms found in IP & IZ.
- Exert maximum efforts to link local supplier firms with foreign firms that can be served as an effective way of improving levels of technology. The government should facilitate to implement the Local Industry Upgrading Program and enter into contractual relationships with foreign firms to transfer experienced technical and managerial employees to local firms. As a result of this initiative, local suppliers can able to transition out of low-wage, labor-intensive industry into more capital- and knowledge-intensive industries.

- Technology transfer will effectively be achievable if academic, policy makers and firms are involved and worked in collaboration in the process of knowledge transfer.

The contribution of FDI firms for technology transfer in the case of "Bole Lemi Industry Park" and "Eastern Industry Zone"

- Link domestic manufacturing enterprises systematically with foreign firms in IP & IZ in order to develop their technological capacities and to benefit them from international market.

- To enhance and improve technology dissemination, it is imperative for government to establish and implement policies that help enhance the absorptive and adaptive capacities of the firms. This includes creation of skilled workforce through the interaction of the foreign firms and learning institutions to promote quality, competitive domestic firms. Skilled labors can easily absorb the new knowledge and modern techniques. Labor does not mean only the number of workers, but also the quality of human capital, which necessitates adequately of education and skills. Better human capital can assimilate technology better, and give more productivity. With equivalent in educated and skilled labor and technology level, local firms might easily assimilate the advanced technology of foreign firms. At the same time, domestic firms could rapidly catch up the know-how and managerial skills transferred from foreign firms.

- Provide good environment domestically to attract R&D institutions of multinational companies to inhabit down in Ethiopia. Innovation does not mean "innovation by us". Technology innovation is an environment open to the world, so Ethiopian firms that belonging in the Industry Zones should integrate with global technology resources for innovation. The domestic enterprise should use this opportunity to share their innovation and technology resources in order to enhance its own innovation capability. Currently, internationalization of foreign multinational R&D is a new trend, many multinational enterprises set up R&D institutions abroad in order to encourage the localization.

- Technology usage and linkages between foreign firms in the IP & IZ and domestic firms are among the key modes of transmission of knowledge of technology. Effective utilization and transmission of technology from foreign firms to domestic firms depends on the degree and the speed, the type, the scale and quality of the interface that exists between them.

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APPENDIX: B

Questionnaires Survey

Title: ***The contribution of FDI firms for technology transfer in the case of "Bole Lemi Industry Park" and "Eastern Industry Zone"***

Dear Respondent!

This questionnaire is prepared to obtain information from key informants with self-administered semi-structured questions. The information is required for the academic research entitled ***The contribution of FDI firms for technology transfer in the case of "Bole Lemi Industry Park" and "Eastern Industry Zone"***, which is being conducted as partial fulfillment of Master of Art on Public Management and Policy. This questionnaire gathered information from managers & supervisors in bole lemi Industry Park and Eastern industry zone.

Notice: Your response is highly valuable and contributory to the outcome of the research. All feedback will be kept strictly confidential, and utilized for this academic research only. However, please be assured that the information you provide in this study will have no effect on your business.

Thank You in Advance for Your cooperation!!!

Section I: Background of the Respondents and Organization Profile

1. Sex

A. Male B. Female

2. Educational Qualifications (General)

A. Certificate B. Diploma

C. Degree D. Masters or above

3. Relevant working experience (Years) in this company?

A. Less than 2Yrs B. between 2-4Yrs C. >4Yrs

4. Establishment year of the Co, _____

5. The investment category of your firm working on _____

Section II: Questions Related with Status of Technology Equipment

Please indicate the extent to which you agree with the following statements by using a scale of 1 to 5 Where; 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral (uncertain), 4 = Agree and 5 = Strongly Agree.

6 Doesthe modernityand production processes of your equipment's are equivalent in comparison with available processes and technologies in the developed world?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D.Not Agree

7 Does the firm timely updates its equipment's by importing new technology?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

8 Does the production capacity of this company underutilized under normal circumstance due to lack of necessary latest technology?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

Section III: Questions Related with Policies and Incentives

9 Do you believe the policies and laws influence your firm to contribute for technology transfer to local personnel's?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

10 Do you agree that the policies and laws regarding technology transfer from foreign firms, facilitates the transfer of technology for local firms?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

11 Do you believe that there are sufficient incentives available in particular to firms that have the potential to make major contribution to technology transfer?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

-

12 If you believe that there is an incentive provided by the government, what kind of incentive? Please specify _____

Section IV: <u>Questions Related with level of linkage and collaboration</u>

13 Do you have a detail cooperation agreement for technology transfer with the government agency?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

14 Does your firm procure its production raw material input from local manufacturers & suppliers?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

15 Does the company interact with local suppliers with the intention of helping them to improve their operation by the transfer of technology or know-how through design and process know-how?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

16 Does your firm collaborate with local firms in sharing technological software and hardware for mutual benefit?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

17 If your level of collaboration is limited, what a reason could you forward as a major constraint?

---

18 Does your firm allow and collaborate,on the job and entrepreneurship trainings for the technical and vocational education and trainings and higher education institutions?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

Section IV: Questions Related with Local TechnologicalStatus

19 Do you believe that there is local's technological capability to absorb, improve and emit the oncetransferred technology?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

20 If it is difficult for local companies to modify the once acquired technology, what doyou think is the main obstacle?

_____

21 Do you believe that the government exert maximum effort in assuring the participation of local technicians during the implementation of technology intensive projects and industries inassociation with foreign firms with the objective to build local technological capability?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

Section IV: Questions Related with personnel development

22. Do you timely Replace expatriate personnel or professional by Ethiopian national's after transferring required knowledge and skills through specialized trainings?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

23. Do you believe that the local employees are capable enough to make effective use of imported technology?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

24.Does the employees of your firm areflexibility to adopt the changing nature of product and service?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

25. Does your firmrotate the positioning of personnel's with the intention to facilitate knowledge sharing activity between employees?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

26. Do you arrange planned training programs for local employees in the intention to upgrading the technological capability?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

27. Have you ever hired an employee who has been working on other similar firm with the intention to know the working knowhow of the other firm?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

28. Do you know someone who left your company and establish or join other rival firm to yours which you consider as a major flow of technological knowhow from your company to others?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

Section IV: Questions Related with Research & Development

29. Does your firm carryout a research and development activity?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

30. If "yes", do you believe the outcomes of these research and development activities is relevant & mandatory for your firm?

A. Strongly Agree C. Neutral E. Strongly Disagree

B. Agree D. Not Agree

The contribution of FDI firms for technology transfer in the case of "Bole Lemi Industry Park" and "Eastern Industry Zone"

APPENDIX: C

Interview Guide Questionnaire

NOTE: The questions including in the interview used to collect data from heads of foreign firms in the IP & IZ, Investment commission and Industry minister. The questionnaire contains all questions, which would help to extract a maximum information from the respondents. Depending on the nature of the interviewee, personal enquiry method will use or contact some of selected respondent personally.

Dear Respondents!

The information that you are going to provide serves as a valuable input for conducting a research paper on the title" ***The contribution of FDI firms for technology transfer in the case of "Bole Lemi Industry Park" and "Eastern Industry Zone***" for the partial fulfillment of the requirements of Master of Art on Public Management and Policy. The information that you are providing will only be used for academic purpose. Thus, you are kindly requested to provide genuine response.

PERSON TO CONTACT: .....

POSITION: ……...

DATE OF INTERVIEW.....

1. Could you explain the basic structure of the Industry Park and its mission?
2. What are the basic goals of developing this IP & IZ?
3. Can you describe the co-operation between the Industry Park and the connected University in the country more detail?
4. How foreign firms cooperate with higher learning institutions with the intention to transfer technology?
5. Arethere any formal rules for these connections?

6. How would you describe the current status of activity of technology transfer level between the foreign firms within the IP & IZand the local firms and higher learning institutions?
7. Which role do the informal interactions play in terms of technology knowledge transfer?
8. Could you extrapolate on the issue of barriers to knowledge transfer?
9. Does the Industrial Park management actively support or stimulate the co-operation between employees of tenant firms and the learning institutions? Or among the firms?
10. Is there any kind of control maintained over these activities?
11. How do you ensure, if at all, that technological knowledge is transferred from the firms to the higher learning institution? Do you have any kind of measurement for this?

Thank you very much for having taken the time to replay this interview!!!