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Strengthening Technology Transfer Process: Some Options for Bangladesh Economy

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Abstract : *Effective transfer of technology has far-reaching implications for indigenous technological capability building for a developing country, because such transfer further develops ability of the recipient country to adapt, improve and generate technologies to cater for local needs. It can also create an opportunity of leapfrogging for developing countries by acquiring technology which are available in the market and investing scarce resources in advanced technology development. So, smooth functioning of the technology transfer process is of critical importance. But technology is not freely flowing and the process of transfer can work effectively only under certain set of conditions. Again, such transfer may not facilitate either efficient utilization of technology or learning from the acquired technology if technological capability of the recipient country is sufficiently weak. However, an active intervention of the government may create necessary conditions and environment to strengthen the transfer process and enable the recipient country to derive the maximum benefit of it. The paper explains the process and mechanism of international transfer of technology and outlines some policies that could be adopted to strengthen the flow of technology into our country to facilitate technology-baser1 development.*

Introduction

Technology is a strategic variable for economic development and growth. No country can make all required technologies.

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So a country has to import of some of the technologies from abroad. But import of technology is not free or costless. There are lots of impediments and costs involved on the way of import of technology.

In the recent years, the technology market has become more concentrated and oligopolistic. The increasing globalization of the world economy, which got momentum from massive privatization, liberalization of economies and trade, and introduction or strengthening of market mechanism in many countries around the world, has intensified competition and concentration among heavily oligopolistic multinational enterprises. This is making imperfect or distorted the market of technology over time. The lack of information about technology has also made this market highly distorted.

Technologies are different from commodities in many respects, their prices are not determined by the market forces, rather dictated by the Multinational Corporations (MNCs). The advantageous position and superior strength of MNCs from monopoly control over technology along with the political power of their home country enable them to claim arbitrary the price, which often causes excessive costs of importing technology for the recipient country. The costs of import of technology for such market failure in international technology market can be divided into two categories, viz., the direct costs and indirect costs. The direct costs include high profits, royalties and fees. The indirect costs include: territorial market restraints, tying transferred technology to purchase of goods and services within the MNC system, restricting the recipient from entering into agreements involving competing or complementary technology, restriction on R&D, and restriction on adaptation and innovation of technology.

On the other hand, abnormally poor technological capabilities of the recipient country may hinder transfer of technology. The investors of the recipient country may not possess the required

expertise in searching various sources of technology, selecting the most appropriate one, negotiating the price, terms and conditions, installing the machinery bought from the suppliers and operating the machinery.

So in order to facilitate uninterrupted flow or to strengthen flow of technology into a country, information pertaining to various sources of technology should be made available to the local entrepreneurs and their technological capabilities to absorb the imported technology should be augmented which may enhance their bargaining power, reduce the costs of import of technology and facilitate effective and dynamic transfer of technology. Moreover, proper infrastructure should be developed so that local investors can assimilate the imported technology quickly. For this purpose some policy intervention is highly desirable. The objective of this paper is to formulate some policies that can be adopted to strengthen the technology transfer process in the country to facilitate and accelerate technology based development.

International Transfer of Technology: Why and How?

For a better understanding of the meaning and process of international transfer of technology, the concept of technology should be discussed first.

The Concept of Technology

Technology is the essential input for the production of goods and services. According to APO (1994), technology represents a form of theory, information, or knowledge, which can generate, in combination with other factors of production, products and services. It is the priced assets that create value through documents, machinery or knowledge embodied in people. Technology is classified as visible and invisible assets. While the former include drawing, specifications, manuals, documentation, computer programs, data bases or patents, the later represents know how, skills, or software that are not easily transferable in a descriptive form.

UN-ESCAP/APCTT (1989) has defined technology to be comprised of four following components, ***viz. Technoware, Humanware,*** *Inforware,* ***and Orgaware.***

Technoware refers to object embodied physical facilities necessary for transformation of input into output. It mainly refers to physical form of technology viz.- capital machinery, equipment, instruments, devices, structures etc.

Humanware refers to the quality embodied in a person for operation of machinery. It mainly refers to human skills and experiences necessary for transformation, viz., knowledge, expertise, creativity, craftsmanship.

Inforware refers to record-embodied documented facts to operate machinery. It mainly refers to facts and information required for transformation, viz., designs, specifications, manuals, theories, charts etc.

Orgaware refers to institution-embodied organizational framework. It refers to operational technologies such as methods, techniques, linkages, practices, knowledge to coordinate all production activities for achieving purposeful results.

Each component of technology is continuously changed in terms of degree of sophistication.

The four components of technology are complementary to one another and are required simultaneously for any productive activity. No transformation can take place without complete absence of any one of these components.

In this paper technology conceived to be a coinbination of machine and equipment, the information and human skills to operate them and the human ability to integrate and co-ordinate all these elements. So in order to make the technology transfer process efficient and successful, all of these elements should be transferred to the recipient enterprise.

The Concept of Technology Transfer

The transfer of technology is the acquisition, development, and utilization of technological knowledge by a country other than that in which this knowledge originated. The term technology transfer implies the movement of technology from the technology owning entity (the transferor) to another, and if the transfer is successful, the receiving entity (transferee) will have a proper understanding of effective use of the technology. If the transferee is unable to understand and use the technology effectively, the transfer is considered incomplete. In general there are two major classes of technology transfer, namely, vertical technology transfer and horizontal technology transfer. Vertical technology transfer represents a flow from laboratory research through developmental stages to ultimate commercialization. Horizontal technology transfer is essentially the transfer of established technology from one operational environment to another. The environment can be national as well as international. When movement of technology takes place between two different countries, such transfer is termed as international transfer of technology

Technology transfer takes place in three stages. In the assimilation stage, the recipient absorbs and digests new technology. In the adaptation stage, technology is modified to suit the local conditions. In this stage the basic capabilities are developed to repair, maintain, and control of the machinery. Once the recipients possess the necessary capabilities in maintenance, repair, and control of machinery, the process of technology transfer is complete. Finally, in the development stage, the recipients possess the capability to generate engineering renovations in design, process or operational know-how based up on the original technology.

Rationale for Import of Technology from Abroad

Effective transfer of technology can benefit the recipient economy in a number of ways.

First, the host country can learn technology from the seller at a lower cost. Thus through transfer of technology technological capabilities (ability to acquire, use, adapt, and improve of imported technology) of an economy can be developed. Technological capabilities (TCs) are of critical importance to an economy because they can contribute significantly to further technological competence building. TCs generate indigenous ability to absorb foreign technology quickly and thus expedite further technology transfer. TCs also cerate necessary abilities to generate new technology to suit the local needs or use the local raw materials.

Second, technology transfer may enable a country to acquire required technology to achieve competitive advantage in international market and facilitates cross border trade. The cross border trade may act as a driving force for economic growth and enhance standard of living of the people.

Third, it saves considerable amount of foreign exchange for acquiring foreign technology through facilitating development of indigenous technology.

Fourth, it may eliminate technological dependence in the long run through development of necessary capabilities for generation of required technology.

Fifth, it saves resources and time of low-income countries for developing a technology which already exists in international market. **A** country can save R&D costs for developing such technology and devote the limited resources for better use such as assimilating and improving the transferred technology.

Sixth, it facilitates generation of employment and investment, which could not be activated due to lack of technology.

Seventh, technology transfer facilitates entering into untapped markets, domestic or international, which would have been impossible without acquiring required technology from abroad.

Finally, it can create an opportunity of leapfrogging for low income countries by acquiring technology which are available in the market and investing scarce resources in advanced technology development.

Seller's Motives for Selling Technology

The possession of unique technologies is one way in which enterprises differentiate themselves from their competitors, and is therefore a source of monopolistic advantage. The question that arises now is that if technology is a source of monopolistic advantage, which facilitates the earning of supernormal profits, why would a transferor who owns the technology pass on to a transferee who may be a potential competitor in future. According to Ford and Ryan (1981), Goulet (1988), Stobaugh and Wells (1984), some of the important motivating factors are as follows:

Getting Most out of the Technologies Developed

The ever increasing costs and risks of R&D, especially basic research, has put pressure on companies to get the most out of the technologies they developed especially those that are not of immediate relevance to their own lines of business.

- *Technologies developed may not fit into the company's overall strategy*

Some technologies may not fit into a company's overall strategy. Their application may be in markets that are too small or undesirable or the company may have ethical objections to their use.

• *Fear of imitation*

Producers of products based on new technologies frequently rely on patents as a protection of reverse engineering, especially by clever Third World producers with lower labor costs. But excessive reliance on patents may be impractical. Even in the developed regions where patent laws and enforcement procedures are well established, protection is not always guaranteed.

Fear of competitor's sales of technology

A company may refuse to sell a technology to an overseas producer because it fears competition at home or in other markets. However, if a competitor agrees to sell that technology, then the first company will face the same competition without any compensating royalty payments or any control over the technology's diffusion.

• *Inability to exploit the technology due to organizational problems*

A firm that has developed a technology may **lack** the resources or skills to utilize the technology.

• *Tapping unavailable markets*

A company may find that certain markets, while attractive, are unavailable to it because of government regulations. The company too may not want to enter it alone. In many developing countries, very complex restrictions on imports and foreign investment make it impossible for a transferor of technology to operate freely in that market. Language, cultural differences and bureaucratic impediments may also scare the transferor going it alone. A company can realize profit from such market selling technology.

• *Restrictions in direct exploitation of technology by antitrust legislation*

A company may be restricted in its direct exploitation of technology by antitrust legislation.

- *Rapidly standardizing the newer technologies*

Transferring technology may accelerate the process by which an industry standardizes technology. This could help the industry to grow.

- *Creating good competitors for stimulating demand and sharing costs of pioneering*

Transferring technology may be a means for creating good competitors, which in turn can stimulate demand, block further entrants and share costs of pioneering.

- *Getting transferee's technology*

A firm may transfer a technology in turn for a technology that the transferee may possess.

- *Using cheap labor and incentives offered by developing countries*

International differences in wages and a host of incentives such as tax concessions, exemption from import duties, good infrastructure facilities, disciplined and non-aggressive labor etc., encouraged many developed country firms to transfer technology to some developing countries to produce a range of items which they either buy back or export to their current markets.

- *Reinforcing the technological dependency of the firms in developing countries*

Many firms in the developed countries prefer to transfer a succession of technologies to firms in the developing countries so that the technological dependency of the latter can be reinforced.

- *Political factors*

Political factors, especially security-related issues, induce technology transfer in some instances and block it in others.

Elements of International Transfer of Technology

Effective transfer of technology means the receiver understands the technology and able to use the technology to achieve desired objectives. The effectiveness of international transfer of technology depends on at least six elements. These are:

- *Transferor and Transferee*

The entity that possesses the technology that is being transferred is called transferor. The entity that seeks and receives the technology that is being transferred is called transferee. Transferor and transferee can be individual, organization, or nation.

Linking Mechanism

Linking mechanism is the means by which technology is transferred from the transferor to the transferee. Linking mechanisms may be classified as direct and indirect, external and internal, market oriented and non-market oriented. A detail discussion about various mechanisms of technology transfer is presented at the end of this section.

- *Transferor Environment*

Transferor environment is the immediate set of conditions under which the transferor is operating at individual, organizational or national level. Some of the conditions that would determine the supportiveness of the transferor environment are its economic status, technological status, an inward versus outward orientation, stability, attitude and commitment towards technology transfer activities etc.

- *Transferee Environment*

The immediate set of conditions under which the transferee is operating is the transferee environment. The transferee environment is mainly determined by the absorptive capacity of the transferee. Physical and organizational infrastructure, skills availability, attitude and commitment to change, inward versus outward orientation, economic status, technological status, stability, etc, are the factors that determine the absorptive capacity of the transferee.

- ***Greater Environment***

The environment encompassing both the transferor and transferee environments is greater environment. Even if the transferor and transferee environments are conducive for technology transfer, such transfer can not take place unless the greater environments permit. Technology transfer between two firms in two nations would depend on greater environment conditioned by factors such as political relationships, exchange rates, investment climates, trade negotiations, balance of trade problems, technological level of nations, international competitions etc.

Mechanisms of Technology Transfer

According to Patel (1972), there are many ways of transferring technology to the developing countries and these countries can use a single way or a combination of ways simultaneously to obtain all the elements of technological knowledge needed for setting up the required production facilities. The choice of one or several of these ways is usually dictated by the nature of the technological capabilities already existing in the developing countries. Patel has suggested the following eight ways of transferring technology. All of the knowledge is most likely to be transferred through one or several of the following ways:

(i) Flows of books, journals, and other published information. (ii) the movement of people between countries, including immigration, study visits, and other travel (iii) knowledge of goods produced elsewhere. (iv) Training of students, technical staff and employment of external experts. (v) exchange of information and personnel through technical cooperation programs. (vi) import of machine, equipment, and related literature. (vii) agreements of patents, licensing, and know-how. (viii) foreign direct investment and operations of MNCs.

Buckley (1985) has classified mechanisms of technology transfer according to *way of transfer*. According to him, *internal transfer* takes place in case of wholly owned foreign affiliates, joint ventures, foreign minority holdings, and *external transfer* takes place in licensing, turnkey contract, contractual joint ventures, franchising, management contracts and international subcontracting.

According to Pavitt (1985), mechanism of technology transfer depends on the type of technology and the organization involved in transfer process. In the sectors, where the firms are suppliers dominated, technology mainly comes through production machines. In production intensive firms, the key technologies are related to the construction and operation of large-scale plants and are transferred through know-how agreements. In sectors supplying production equipment, technology is transferred through reverse engineering and through local linkage with production engineering departments of production intensive user firms. In science based firms, the key technology emerges mainly from industrial R&D and in some cases from academic research.

On the basis of *linkage* of transferor and transferee, Sharif (1995) has classified the mechanisms of technology transfer. According to him, most important mechanisms of technology transfer through *direct linkage* are: operation of TNCs, licensing, hiring of experts and contractors, and training of staff abroad and through *indirect linkage* are: purchase of machinery, exchange of information at international meetings, flow of books and journals, exhibitions and trade fairs.

Grosse (1996) has classified mechanisms of technology transfer into two categories, viz., vehicles of technology transfer and means of technology transfer. According to him, *vehicles of technology transfer* are *FDI*, licensing, technical assistance contract, training, turnkey contract, representation contract, export, franchising, management contract, R&D contract, co-production

agreement and subcontracting. On the other hand, *means of technology transfer* are hardware, software, people transfer, training, documentation, communication, and agreements.

Ramanathan (1997) has classified the technology transfer mechanisms into market oriented and non-market oriented mechanisms. According to him, *market oriented mechanisms* are: purchase of plant, equipment and products, foreign direct investment, joint ventures, technical collaboration, subcontracting, turnkey contracts, product-in-hand contracts, production sharing, management contracts, joint research ventures, expert services.

On the other hand, the *non market oriented mechanisms* are: books, academic journals, business magazine, technical information services, industrial fairs and exhibitions, informal personal contracts, participation in conference, seminars and workshops, and training.

Government Policies Toward Technology Import in Bangladesh

Government policies of Bangladesh for promoting transfer of technology have been reflected in various Plan documents, National Science and Technology Policy, Industrial Policies and investment related publications. Reviewing these documents, it becomes evident that, government has always pursued the policy of 'make some, buy some'. On the one hand, government encouraged indigenous capability building for development of technology for meeting the local needs, on the other hand, government has emphasized on the development of local capability for import, utilization and assimilation of foreign technology. The policies of the government about import of foreign technology reflected in technology policy, various plan documents and industrial policies are discussed below.

Five Year Plans

The policy of the government about foreign technology acquisition from abroad was first spelled out while formulating the Second Five -Year Plan (SFYP 1980-85). The plan document made a declaration 'a comprehensive approach will be made for the development of skilled manpower, acquisition and adaptation of foreign technologies and development of technologies suitable to the condition of the country'. The third FYP (1985-90) and fourth FYP (1990-95) also laid emphasis on development of national capability for use and adaptation of imported technology. The fifth FYP (1997-2002) also made an intention of linking entrepreneurs with foreign and local suppliers of technology through establishment of a Technology Transfer Board to facilitate technology transfer into the country. The Plan also envisaged providing incentives to the local entrepreneurs for transfer and absorption of foreign technology.

National Science and Technology Policy (NSTP)

The government's policy for promoting technology transfer into the country has been more evident in National Science and Technology Policy 1986. The basic objectives of the technology policy were to facilitate the development of indigenous technology and efficient transfer of imported technology. To achieve these objectives, NSTP envisages 'establishment of a national capability for development of indigenous technology and attainment of a national capacity for assessment, selection, acquisition and adaptation of foreign technology'. NSTP also promised to 'devise appropriate legal, fiscal, and financial instruments for selection, importation, absorption, and adaptation of foreign technology'.

NSTP also envisaged to 'ensure establishment of institutional facilities for relevant knowledge assimilation and skill development for learning absorption process for imported technology'. Moreover, in order to facilitate technology transfer,

emphasis was laid on strengthening and establishing relevant institutions and co-ordinating activities of different organizations.

As a major step towards the implementation of the NSTP, a Consultative Committee on Transfer of Technology was formed in 1987, which made the following recommendations:

(a) Formulation of medium term technology plan on the basis of medium term socio-economic (Five Year) Plan of the country. (b) assessment of technological needs and capabilities of the country. (c) publication of technology schedule regularly. (d) ensuring the application of appropriate technologies in the implementation of the developmental activities of the country. (e) taking necessary legal, economic and financial measures for smooth development and application of technology. (f) organizing necessary training and research programmes for facilitating technology development and assimilation of imported technologies.

Industrial Policy

The Industrial Policy 1991 stated that 'measures will be taken to encourage research and development **and** promote **development,** acquisition, and transfer of technology. At the same time, an institutional framework for overall technology development will be crehted.' In this policy, it has been declared that an advisory committee will be formed comprising representatives from different regulatory bodies and .technology users. This body will embark on recommending the type of technology to be imported until a Technology Development and Transfer Centre is established. Similar statement was made in Industrial Policy 1996. The Industrial Policy 1999 also committed to simplify the procedure for licensing imported technology to facilitate technology transfer into the country.

From above review of government's various plans and policies for promoting technology transfer, it becomes evident that these

plans and policies only contain intentions of the government without explicitly specifying any programmes and strategies for their realization, which indicates a serious weakness of the government's commitment to strengthen technology transfer into the country to facilitate technology based development.

Although some incentives are provided to the entrepreneurs to facilitate import of machinery through tariff systems, there is lack of specific incentives to encourage learning technology from assimilation of imported technologies. The policies are designed to facilitate only *static* transfer of technology (transfer of machinery only without any ultimate impact on technological capability building) rather than dynamic transfer of technology (transfer of technology that generates capability for adaptation, modification and improvement of imported technology immediately and further development of new technology in the long run). Government policies and plans should clearly spell out specific strategies, programs and incentives to encourage dynamic transfer of technology to facilitate technology learning.

Some Policy Interventions for Promoting Technology Transfer in Bangladesh.

The following policies can be adopted to strengthen technology transfer process in Bangladesh.

- Strengthening the Activities of National Council on Science and Technology (NCST).

The National Council on Science and Technology (NCST) is the apex body for management and integration of technological considerations into planning process for socio-economic development. Executive Committee of NCST (ECNCST) recommends various measures to be taken for technological development in the country. The activities of NCST should be strengthened to organize and monitor technology transfer more effectively.

NCST should be entrusted with the responsibilities of undertaking technology forecasting and technology assessment (through systematic monitoring and evaluation of world technological trends) for the identification of priority technological needs and areas of specialization. According to this assessment appropriate fiscal and financial measures should be formulated to encourage transfer of technology in priority sectors or technological deficient sectors.

Functioning of the consultative Committee on Technology Transfer (as recommended by ECNCST) should be made effective. The Ministry of Science and Technology should exert a constructive role in this regard.

- Planning for Technology Import

The Planning Commission should formulate a long term plan for the goods and services to be produced, for example in next 20 years, in addition to its customary formulation of medium term and annual development plans. In order to meet the demand for technology for producing these goods and services, industries should be classified into 3 domains, viz., importing technology domain, traditional technology domain **and** exporting technology domain. Appropriate policies should be formulated to encourage the import of technologies in the industries that have been classified under importing technology domain. Import of technologies under other domains should be discouraged to build local capability to generate required technologies.

- Framing Guidelines for Technology Imports

External Resources Division may frame appropriate guidelines for evaluating the technology import aspects of aided projects and other projects carried out by private entrepreneurs. Such guidelines may be framed with inputs from Ministry of Science & Technology, Planning Commission and experts from academic and S&T institutions.

In most of the countries, for evaluating technology imports in both public and private sector, a Technology Transfer Board has been instituted. But in Bangladesh, its implementation at the Ministry of Science and Technology awaits for quite long time. This board should be established immediately and should be entrusted with the responsibility to disseminate information pertaining to the sources of technology, impart training for skill creation, land offer advisory, constancy and extension services to the entrepreneurs for selection, erection and adaptation of imported technologies.

Technology Transfer Board should also evaluate appropriateness of technology and control mechanisms of transfer. For example, the board should discourage turn-key contracts and ensure that the imported technology contributes to country's needs including enhancement of technological capability. Imported technology should conform to national standards, codes and specifications.

- Skill Creation for Facilitating Technology Transfer

One of the important reasons for slow pace of technology transfer in Bangladesh is the low technological capability of the local people. In order to make technology transfer process dynamic, efficient and faster, availability of trained and highly educated scientific manpower should be ensured. Proper planning for development of human resources in the field of science and technology should be undertaken.

For development of human skills government should establish academic institutions for higher education in science and technology. The centers of excellence should also be established to impart training for scientists and technicians in highly specialized field of science and technology. More vocational and technical institutes should be established to ensure adequate training for technicians. More training institutes for development

of human skills in various functional areas, for example management, marketing, finance, should be developed. Steps should also be taken to establish design centers to develop indigenous designing capability.

Government should sponsor higher education for scientist and researchers in local or overseas institutions. Moreover, short term and long term training for government and private officials in specialized field of science and technology should be arranged for skill creation.

Government should allow the private firms to claim tax exemption on expenditure incurred for training of employees to develop human skills. Government may create provision for spending a certain proportion of total profit of private firms for training program of personnel promulgating law. Employees should be allowed to claim tax èxemption on money spent from their salary for receiving training and education.

The government can introduce credit facilities for the students who intend to pursue higher education in science and technology at cheaper interest rate and on easy terms and conditions for long term basis.

- Promotion of R&D in Private and Public sector

In order to facilitate more and better utilization of imported technologies, R&D capabilities of private industries should be enhanced. The local scientist and technicians should have the capability to adapt, improve and modify the imported technology to make use of local raw materials and conform the requirements of local consumers. So government should take proper steps for enhancing R&D capability.

Government can promote R&D in public sector by establishing more R&D institutes and allocating more funds for

R&D. In private sector, enterprises should be encouraged to spend more on R&D through tax incentives.

Government can also engage several firms to initiate joint research to share cost and thus help them get rid of constraint of financial and human resources in carrying out R&D projects. Government can also induce firms to engage in cross border joint research for development and modification of imported technology.

Loan, grants, and subsidies for the research projects undertaken in both private and public sectors should be provided for development of new technology as well as modification and improvement of imported technology.

Government should also strengthen interaction among R&D institutes, academics and industries through co-ordination, which can also increase the possibility of improvement, modification and use of imported technologies.

- Strengthening R&D Infrastructure

Government should take necessary steps to promote standard testing institutes and quality and skill certification institutes. Proper infrastructure should be developed to strengthen and enforce intellectual property rights.

Consulting firms in the private sectors should be developed with appropriate incentives so that they can provide necessary services for acquisition of technology, for example from feasibility study to installation of machinery. Establishment of training institutes should be encouraged for development of expertise in technology transfer process.

Industrial information center should be established for providing information related to technology. Database on technology of different fields should be developed and information network for dissemination of all necessary

information required by the industrial entrepreneurs should also be established.

Specialized library equipped with necessary journals and books related to science and technology should be established to ensure access to information on emerging technologies.

- Providing Financial Incentives for Import of Technology

For encouraging import of technology in technology deficient sectors, government should allow import of capital machinery and raw materials tax-free or at a low rate in these sectors. The enterprises should also be allowed to get access to bank credit at a preferential interest rate for import of capital machinery and raw materials.

- Financing for Modification or Improvement of Imported Technology

Government should induce financial institutions and intermediaries to provide venture capital to the private sector for modification or improvement of imported technology.

Industrial financing institutions should be encouraged to provide venture capital, risk capital etc., to those undertaking reverse engineering efforts to absorb foreign technologies without infringing international patent rights. Preferential financial and credit facilities in terms of lower rates of interest are desirable for this purpose.

- Utilization of FDI to Facilitate Technology Transfer

Foreign Direct Investment (FDI) is considered to be an effective vehicle for transferring technology to the developing countries. Particularly the experiences of Newly Industrialized Economies (NIEs) were very encouraging in this regard. FDI has played very significant role in transferring technology in the early stage of industrialization in these countries. But unfortunately

Bangladesh has achieved very little success either in attracting FDI or in acquiring technological capability from FDI. The poor achievement of Bangladesh in acquiring technological capability from FDI can be attributed to the inability of the government to formulate proper policies and guidelines to promote technology transfer and facilitate technology learning from MNCs. Although since the beginning of 1990s more emphasis has been laid for attracting FDI liberalizing state policies, but real success in this regard is very dismal. The main impediments on the way of attracting FDI are: poor infrastructure, severe scarcity of utility services, bureaucratic procrastination in getting public services for setting of an industrial unit, corruption, political instability, labor unrest, lack of trained manpower etc.

Goveinment should take proper steps to remove all impediments and bottlenecks on the way of foreign investment and formulate appropriate policies to attract and channel FDI into the country. Policies should be formulated in such a way that transfer of technology from such investment is maximized.

Conclusion

There are two different options for acquiring technology for a least developed country (LDC) like Bangladesh. First, to develop indigenously all technologies. Second, to import from technologically advanced countries. But due to lack of human and financial resources a LDC can not generate all required technologies. It is wise to take a balanced stance: make some and buy some. So Bangladesh should make efforts to build necessary capabilities to generate technology only in few selected industries. For other industries, import of technology is a good option, because it saves money, time and labor which would have been invested in duplication efforts for developing technologies that are already available in the market. By importing technology we can make better use of our scarce resources. But we have to be careful while making decision for import of technology. We should not

consider import of every technology because it can result in dependence on foreign technology in the long. run. For a few selected industries, we have to make all out efforts to generate state of the art technology to meet our own demand and then we have to consider the possibility of export.

For the technologies eannarked to be imported, necessary conditions and environment should be created in the country removing all impediments on the way of import. Indigenous capability must be developed sufficiently to take the advantage of technology transfer. All necessary assistance should be made available to strengthen the bargaining power of the local entrepreneurs so that the costs of transfer can be kept at minimum level. An active intervention from the government in this regard would be extremely useful to absorb quickly the imported technology and thus to facilitate efficient transfer of technology and technology based development.

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