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GERMAN COOPERATION FOR THE DEVELOPMENT OF SMALL AND MEDIUM SIZE ENTERPRISES IN BANGLADESH: NEW IDEAS AND APPROACHES

I

INTRODUCTION

Industrial policies, including investment incentives, tariffs, foreign exchange allocations by successive governments in Bangladesh have tended to favour large enterprises over small and medium size enterprises (SMEs). Though the First Five-Year Plan (1955-60) of Pakistan regime formally recognised the importance of small and cottage industries in the national economy, it was about three decades latter a new emphasis on small enterprises was laid in the national industrial policy. That is, the Industrial Policy 1986 of the Government of Bangladesh (GOB) declared the small and cottage industries a "priority sector" (Industrial Policy, 1986). This new emphasis on small enterprises was not matched by any comprehensive strategy and effort for small enterprise development (HIID, 1987. p.1) The Industrial Policy 1999 of the Government of Bangladesh (GOB) has placed a renewed emphasis on the development of both small and medium enterprises in the country (Industrial Policy, 1999, pp. 2-14). "Dispersal of small
and medium industries will include an important element in the industrial policy approach” (Ibid., p.2).

Developing countries like Bangladesh are increasingly strengthening their efforts to promote SMEs because they: (a) provide a solution to the growing problems of unemployment; (b) promote a self reliant industrial culture, which allows the state to withdraw from providing various services, reducing thereby claims on public expenditure; (c) help easing down the persisting tensions of industrial relations within larger firms and low economic growth (Scase and Goffe, 1987, pp. 11-19). SMEs also stimulate indigenous entrepreneurship, use more economic linkages to agricultural and rural activities. They tend to be flexible, adaptable and innovative.

A large number of SMEs in Bangladesh are characterised by low technical efficiency and productivity, traditional and obsolete technology, and other severe managerial and marketing growth impediments which seriously constrain their competitive and sustainable growth. (see, HIID, No. 3, 1988; HIID, No. 19, 1990; Ahmed, 1990, pp. 35-37). Strategy analysis for competitive and sustainable growth of SMEs in Bangladesh needs to be seriously considered in our development thinking. Also despite the remarkable surge of research interest and the availability of a good number of publications on small enterprises in recent times, little is known about some basic issues of SME development, that is how growth in SMEs takes place in our country.
A Brief Overview on SME Development Partnership

SME development partnership of Bangladesh with the developed countries is relatively a recent phenomenon, dating back to the early 1980s. Japan International Cooperation Agency (JICA) conducted a study on Development Plan of Small Scale Industries in Bangladesh in 1980 (JICA, 1980). The study focused on the establishment of a Production Technology Development Centre (PTDC) for technology promotion of small industries (Ibid.). Subsequently JICA abandoned the effort to implement PTDC and other measures for small industry promotion recommended in the study.

US-AID can be considered as one of the leading donor agencies, which has contributed more towards promotion of small and micro enterprise development in Bangladesh since the early 1980s. US-AID has successfully undertaken and implemented a number of small and micro enterprise development initiatives and projects which also include the establishment of Micro Industries Development Assistance Services (MIDAS), Business Advisory Services Centre (BASC), JOBS Program, etc. Other notable bilateral donor agencies involved in SME promotion include DANIDA, NORAD, CIDA, SIDA, etc.

GTZ is relatively a late starter in development partnership of SME promotion in Bangladesh. SME development partnership of GTZ in Bangladesh started through introduction of an innovative entrepreneurship training programme called New Business Creation (NBC-GTZ Model) through a collaboration of MIDAS and Technonet Asia, a Singapore based networking organisation for industrial development for
the region of South and East Asia, in January-February 1989. No visible effort of GTZ for promotion of SMEs in Bangladesh can be traced between 1991-1995 period. A renewed effort of GTZ became visible since February 1996 through establishment of a special project called "Business Advisory Services (BAS) for Export Oriented Small and Medium Enterprises", a joint collaboration GTZ and Dhaka Chamber of Commerce and Industry (DCCI). In 1997 a modified version of NBC model of entrepreneurship training of GTZ called CEFE (Competence-based Economies-Formation of Enterprise) was introduced. Subsequently a series of CEFE training for diverse target groups of small entrepreneurs in Bangladesh has already been implemented by GTZ in Bangladesh.

Objectives and Methodology

Understanding SMEs and their competitive and sustainable growth in Bangladesh constitute the major theme of this paper. Despite the remarkable surge of interest and renewed emphasis on SMEs, we still continue to know little about how the growth of Bangladeshi SMEs takes place, and how their competitive and sustainable development can be promoted. The paper is aimed at examining:

a. the definitional issues and related problems of SMEs;
b. the problems of growth measurements of SMEs over the last 3 decades;
c. some major growth constraints, particularly relating to the technical and technological constraints; and
d. the contribution of German development assistance to the growth SMEs in Bangladesh.
Based on brief reviews of the above mentioned issues, and to add new dimensions to our development thinking with regard to the SMEs, a wide spectrum of relatively new and less explored ideas and approaches of competitive SME growth are suggested. The ideas and approaches suggested are primarily of exploratory nature, and needs critical investigation and analysis to examine their implementation viability and effectiveness.

The study focuses more on technological constraints and technological competitiveness and cooperation of SMEs of Bangladesh as it has remained so far one of the least investigated areas. Also the recently published Industrial Policy 1999 of GOB emphasises the technological competitive and export-oriented growth of SMEs as one of the major elements of its industrial development vision.

The study is primarily a conceptual and empirical exploration. The data base of this study is constituted by secondary research of the identified and available relevant publications in Bangladesh and abroad over the last three decades. Secondary study findings have been supplemented by some primary qualitative data collected through depth interviews of 14 SME and entrepreneurship experts representing a cross-section of academicians and practitioners from 5 SME promoting institutions in Bangladesh. Case studies have been conducted to assess the role of German development assistance for the promotion of SMEs in Bangladesh.
Definitions of small industries have undergone several changes over the last four decades. Such changes over time have consequently changed the coverage of small industries, and contributed to serious problems of growth measurement of this sector. In the late 70s, small industries were defined as privately owned manufacturing units with employees not exceeding 19 and using mechanical motive power or with employees not exceeding 29 and not using mechanical motive power (BSCIC Surveys, 1977-78; HIID, No. 1, p. 35). This definition emphasised labour intensity predominantly and mechanisation to certain extent. In a country where capital is severely scarce, the emphasis primarily on labour intensity is considered not sufficient. Moreover, this definition was related only to the manufacturing industrial sector, and excluded the service sector.

The definitional criteria used for small industries in the Industrial Policies 1986 and 1991 emphasised capital productivity. The definition of small industries reproduced from the Industrial Policy 1991 includes both manufacturing and service sector. Small industry, according to Industrial Policy 1999 includes "enterprises employing fewer than 50 workers excluding the cottage units and / or with a fixed capital investment of less than Taka 100 million" (Ibid., p.6).
Surprisingly the definitional issues concerning the medium and large industries remained unresolved in the industrial policies of successive governments in Bangladesh. The definitions of medium and large industries in Bangladesh were for the first time given in Industrial Policy 1999 as produced below: "Medium industry will cover enterprises employing between 50 and 99 workers and/or with a fixed capital investment between Taka 100 million and Taka 300 million" (Ibid., p.6). "Large industry is defined to include all industrial enterprises employing 100 or more workers and / or having a capital over Taka 300 million" (Ibid., p.6). It is important to note here that these definitions of small and medium industries by GOB do not explicitly relate to numerous business enterprises of trading sectors of Bangladesh.

The industrial policies in the pre-liberation (Pakistan) and post-liberation periods recognised the small industry sector as an important sub-sector for supporting the overall growth of the economy (Rahman et. al., 1979, p.11). However, the growth of this sector was emphasised in the early seventies for promoting: a) an appropriate process of industrialisation opportunities; b) more equitable distribution of income; c) better utilisation of local economic resources with indigenous technical know-how; d) greater reliance on less-capital intensive technology; and e) more equitable regional economic development through wider dispersal of industrial units (ibid.).

2. Scenario of SMEs in Bangladesh

The BSCIC Survey on small industries in Bangladesh (1991)¹ reveals that as of 1989-90 there were 38,294 small

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¹. Unfortunately no updated relevant industrial statistics are known to be available in our country.
manufacturing industrial units, employing 523472 persons. Each unit employed 13.7 persons and had fixed investment of Tk. 0.75 million on average. Investment per employment created was Tk. 55000, and investment in machinery and equipment per unit was Tk. 0.4 million on average, which constituted 53% of the total fixed investment. This shows that technology and technical aspects constitute a very significant investment characteristic of small industries in our country, and need serious consideration in our national enterprise development strategies and policies.

As mentioned earlier, changes of definitional criteria over the last four decades have created serious measurement problems of growth rates of small enterprises over time. Unfortunately available statistics on growth rates of small industries are about 9 years old and lack reliability. BSCIC's survey results on growth rates based on number of units added per year of small industries (1979-80 to 1989-90) is shown below:

<table>
<thead>
<tr>
<th>Years</th>
<th>Number of Units Added</th>
<th>Growth Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979-80</td>
<td>457</td>
<td>1.90</td>
</tr>
<tr>
<td>1980-81</td>
<td>429</td>
<td>1.72</td>
</tr>
<tr>
<td>1981-82</td>
<td>369</td>
<td>1.46</td>
</tr>
<tr>
<td>1982-83</td>
<td>573</td>
<td>2.22</td>
</tr>
<tr>
<td>1983-84</td>
<td>1020</td>
<td>3.80</td>
</tr>
<tr>
<td>1984-85</td>
<td>1456</td>
<td>5.17</td>
</tr>
<tr>
<td>1985-86</td>
<td>802</td>
<td>5.75</td>
</tr>
<tr>
<td>1986-87</td>
<td>1443</td>
<td>4.72</td>
</tr>
<tr>
<td>1987-88</td>
<td>3043</td>
<td>9.05</td>
</tr>
<tr>
<td>1988-89</td>
<td>2306</td>
<td>6.62</td>
</tr>
<tr>
<td>1989-90</td>
<td>3814</td>
<td>9.60</td>
</tr>
</tbody>
</table>
Table 1 shows steady increase in growth of small industries from 1.9% in 1979-80 to 9.6% in 1989-90.

The percentage contribution of small industry sector to GDP (1991-92 to 1994-95) at current market prices is shown below (BBS, *Statistical Pocketbook, 1996, p.207*).

<table>
<thead>
<tr>
<th>Year</th>
<th>Small-Scale</th>
<th>Large-Scale</th>
<th>Industry Sector as a Whole</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991-92</td>
<td>3.7</td>
<td>5.4</td>
<td>9.1</td>
</tr>
<tr>
<td>1992-93</td>
<td>2.7</td>
<td>6.0</td>
<td>9.7</td>
</tr>
<tr>
<td>1993-94</td>
<td>3.6</td>
<td>6.3</td>
<td>9.9</td>
</tr>
<tr>
<td>1994-95</td>
<td>3.4</td>
<td>6.2</td>
<td>9.6</td>
</tr>
</tbody>
</table>

It is important to note here that despite steady growth rates of small industries over a decade, the contribution of small industry sector to GDP is characterised by a declining trend. Our industry sector as a whole also underwent an insignificant growth during the same period. Statistics on growth of medium sized enterprises are not available which can be attributed to the lack of availability of definition on the same in Bangladesh.

3. Low Technical Efficiency, Productivity and Other Technological Problems of SMEs

Studies and comprehensive literature reviews on measurement and analysis of technical efficiency and

² The latest Statistical Pocketbook 1998 was published in June 1999, and does not contain figures relating to percentage contribution of small industry sector to GDP.
productivity at the sector and industry level are available in a number of developing countries. Literature on measurement and analysis of technical efficiency, productivity and other major technological constraints to SME growth in Bangladesh is scanty.

HIID/ESEPP Project of Planning Commission conducted a study on technical efficiency and productivity growth in 29 manufacturing industrial sectors in Bangladesh. Productivity growth over time was found sluggish in the majority of the industrial sectors (HIID, No. 19, p.14). TFPG (Total Factor Productivity Growth) was found significantly not different from zero in 18 industrial sectors, significantly negative in 7 industrial sectors and significantly positive in only 4 industrial sectors (Ibid., p.9).

Performance of the industrial sector in terms of technical efficiency and productivity was far from satisfactory (Ibid., p. 14). However, marked technical performance differentials were found to exist between the firms within an industrial sector. Some industrial enterprises were found technically quite efficient while some other were found technically very inefficient (Ibid.). These findings can be considered relevant for this study since the private manufacturing sector in Bangladesh is dominated by SMEs. Some possible sources of technical inefficiency are: (a) the size of the establishment; (b) the age of the establishment; (c) skill composition of the work force, etc.

Karim conducted case studies on 10 sick medium-sized enterprises, which were financed by Bangladesh Shilpa Bank (BSB) and Bangladesh Shilpa Rin Sangstha (BSRS) during
the period of 1977-89. His study showed that the major technological/technical factors for poor performance of these enterprises were:

- Defective and wasteful production technology
- Under-utilisation of production capacity
- Substandard product quality
- Obsolescence of machinery
- Poor repair and maintenance of machinery
- High rate of wastage

4. German Development Assistance for SME Promotion in Bangladesh

German development assistance for SME promotion in Bangladesh dates back to 1989 and started, as already mentioned, with the introduction of an innovative entrepreneurship training program called New Business Creation (NBC) in January-February 1989. Then followed another NBC training program exclusively for women entrepreneurs in early 1990. German development cooperation for Bangladeshi SMEs underwent a lull period\(^3\) (1991-1995). This may be attributed to the insignificant success impact\(^4\) in terms of new businesses created by the first batch of 30 trainees of NBC (1989) training, conducted by

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3. Some selected SME professionals from Bangladesh are known to have participated in an NBC-TOT workshop, sponsored by GTZ in Bali (Indonesia) in 1992.

4. It is important to mention here that post-training evaluation showed NBC as a highly successful training, but subsequent training follow-up activities showed little success impact.
MIDAS and Technonet Asia. However, German cooperation is getting increasingly visible in recent times through additional SME promotional measures through the GTZ-BAS Project. The focus of German cooperation in SME promotion in Bangladesh lies mainly in conducting a wide range of small business management and entrepreneurship trainings through a network of Bangladeshi non-government and private sector partner organisations. Case studies of German co-operation for SME development in Bangladesh are presented below:

i. The Case of NBC Training: GTZ Model

NBC (New Business Creation) training marks the start of German cooperation for SME development in Bangladesh. MIDAS, a US-AID sponsored small and micro enterprise promotional agency in Bangladesh, in collaboration with Technonet Asia, a Singapore based networking organisation, launched this innovative training program in Bangladesh for the first time in February 1989 (MIDAS, NBC Brochure, 1989).

This NBC-GTZ training model was first presented by Technonet Asia in collaboration with its partner organisation, the DI in Bangkok, Thailand, in February 1986. Subsequently the NBC model was successfully introduced and tested as a component of Small Business Promotion Project (SBPP) in Nepal.

This successful Nepalese experiment of NBC resulted in its introduction in Bangladesh and in other countries, namely Brazil, Uruguay, Malawi, Kenya (MIDAS, NBC Brochure, 1989, p.1).

NBC training was preceded by a 3-day long Appreciation Workshop of the selected representatives of the small industry
promotion and development financing institutions in Bangladesh. NBC was a 4-week training programme. It aimed at identifying and selecting individuals with character traits as potential entrepreneurs. Thirty participants were given this training, and the program was designed to assist the participants to make self-assessments, to develop and strengthen their entrepreneurial competencies including goal-setting and sharpening their strategies and business related farsightedness. The participants were also given the competencies to identify business projects and develop their own business plants.

Participants' Feedback Regarding the NBC-Part of the TOT Programme

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style of training is relevant to present situation</td>
<td>NBC is not appropriate for illiterate groups.</td>
</tr>
<tr>
<td>NBC is relevant to our target groups</td>
<td>Preparation of business plan is difficult and more practice is necessary</td>
</tr>
<tr>
<td>NBC increases self-confidence to implement a new project</td>
<td>Allows less practice for warming up</td>
</tr>
<tr>
<td>Promotes learning by doing and increases knowledge</td>
<td></td>
</tr>
<tr>
<td>Allows to develop leadership through calculated risk taking</td>
<td></td>
</tr>
<tr>
<td>NBC provides access to lower middle class</td>
<td></td>
</tr>
</tbody>
</table>

Participants' evaluation of NBC showed it as a highly successful and innovative training. MIDAS also conducted post-training follow-up activities of the participants for more than a year. The results showed that very few trainees had established new business enterprises.
ii. The Case of BAS-Project

To promote export-oriented SMEs in Bangladesh, GTZ in cooperation with the Dhaka Chamber of Commerce and Industry (DCCI) established the project "Business Advisory Service (BAS) for Export-Oriented Small and Medium Enterprises' in February 1996 (BAS, Brochure, undated). BAS Project constitutes a component of a package programme of GTZ called "Promotion of Private Sector (PPS) Project" (Ibid.).

The project focuses primarily on the provision of support services to promote export orientation and efforts of SMEs (See Figure 1), The project commensurate with the GOB industrial policy of external competitiveness and export-led economic growth. Also the technical collaboration of BAS project with DCCI represents a good matching since more than 60% of DCCI members are SMEs (Ibid.). Also the Chambers in Bangladesh have in recent times assumed an increasingly facilitating role of creating a favourable and enabling business environment for the rapid and competitive growth of SMEs.

Sectors identified for BAS project coverage include (BAS, Brochure, undated):

Home and household textiles, b) jute goods, c) handicrafts, d) leather goods, e) footwear, f) toys, g) packaging materials, and h) processed food products.

BAS project is facilitating the following services:

1. Providing information relating to: a) general business, b) export procedures, c) German, European and other foreign markets, d) domestic economy, and e) bank loan opportunities.
2. Trainings, seminars and workshops on: a) marketing, b) trends in European markets, c) access to international fairs, d) quality management, e) organisation of production, f) financing and controlling, and g) managerial skills.

Figure 1: BAS Project Framework (BAS, Brochure, undated)

3. Direct marketing: a) facilitating contacts from Bangladesh to Germany, b) facilitating contacts from Germany to Bangladesh, c) support of participation in fairs and trade missions, and d) facilitating buyers-sellers meetings.

4. Consultation on various business projects Feasibility studies on prospective sectors and industries.
iii. The Case of CEFE Model

The CEFE training model is a modified version of NBC model, and the name NBC was changed to CEFE to synchronise the English, Spanish, Portuguese and French translations and acronyms. (Striepke, 1999, p.2). The name and meaning of CEFE have also changed overtime from Creation of Enterprise, Formation of Entrepreneurs to Competence-Based Enterprises through the Formation of Entrepreneurs, which is currently changed to Competence-Based Economies, Formation of Enterprise (Ibid., p.1)

Currently more than 60 countries around the world are actively implementing the CEFE in different variations (Ibid., p. 5.) CEFE has diverse target groups such as street children (Mexico, Brazil), university graduates (Philippines, Thailand, Singapore), women, rural poor/illiterates (Bangladesh), refugees (Mozambique), rural women, students of professional training schools (Tunisia), miners and ex-prisoners (Chile), etc. (Ibid.).

The concept of situational entrepreneurship constitutes the framework of CEFE model which focuses on: a) the interplay of the actor-situation dynamics in the identification of opportunities, b) the formation of appropriate strategies to exploit the opportunities, c) the development of entrepreneurial competencies, d) the drawing up of a business plan to integrate and synthesise the matching of the person with the project, and e) the activation of a business plan through appropriate actions (Ibid., p.3).

MIDAS is the pioneer organisation in introducing this new approach in Bangladesh. The two NBC trainings conducted by
MIDAS, one in February 1989 and the other one exclusively for women entrepreneurs in early 1990, created the preparatory basis for introducing CEFE in 1997 in Bangladesh. Currently CEFE constitutes a component of the PPS (Promotion of Private Sector) Project of GTZ. Some NGOs, namely MIDAS, CENCE, TARANGO and Green Hill, had successfully conducted a number of CEFE courses. The year 1999 is regarded as the time for expansion of CEFE, and the project already developed partnership with 10 organisations in selected six districts of Bangladesh to promote SMEs (Ibid., p.5).

An impact analysis of CEFE activities in Bangladesh cannot be presented in this paper since the required data could not be made accessible for the purpose of this study. But some findings of an impact analysis undertaken by the Federal Ministry of Economic Cooperation in 1994-95 on CEFE pilot activities in selected countries of Asia, Latin America and the Pacific region showed that on average about 60% of the trainees started their business in the post-training period (Striepke, 1999, p.3).

5. A General Discourse on Competitive Growth of Bangladeshi SMEs

The term "competitiveness" is an immensely complicated issue, and has several dimensions. Long-term growth capability and sustainability of an enterprise in an increasingly challenging and competitive business environment will be viewed as "enterprise competitiveness" in this paper. An enterprise can be considered "competitive" when it develops and attains relatively higher marketing, technological
advantage and managerial and financial strengths over similar enterprises at home and/or abroad. Sustainability is termed here as the "long-term value existence" of an enterprise. Export-oriented, non-traditional sector SMEs (e.g., ready-made garments, frozen shrimp) need to focus more on "external market competitiveness". Domestic market oriented SMEs need to focus on "internal market competitiveness".

It is difficult to identify all factors and requirements for competitive, long-term growth of SMEs. However, three sets of distinctive, but interrelated factors or pre-requisites (requirements) can be viewed as important for SME development. These are: (a) institutional requirements (factors), (b) technological requirements, and (c) infrastructural requirements.

Institutional competitive growth requirements can be categorised as: (a) intra-institutional, and (b) extra-institutional. Intra-institutional requirements may include factors like: (a) institutional capacity development and strengthening through on-the-job and off-the-job training programmes, (b) strengthening of managerial effectiveness and efficiency, (c) focusing on development and implementation of realistic and effective enterprise growth strategies and policies. Technological requirements may also be categorised largely as intra-institutional phenomenon.

Extra-institutional competitive growth requirements or factors may primarily relate to enterprise market development and strengthening. Such requirements might constitute the factors, which make up for market failures, and remove enterprise market inefficiencies. Also development of
Enterprise promotion and support service institutions and their effective networking with enterprises can be seen as an important institutional requirement for enterprise competitiveness. Support service requirements include financing, counselling, entrepreneurship development and other training and extension services. The set of institutions providing such services may be termed as "institutional infrastructure".

Physical infrastructural requirements relate to factory accommodation (including provision of plots in industrial estates), transportation, utility and other related service facilities, provision for custom-built premises or warehouse facilities, etc. Technological competitive growth requirements relate more to: a) indigenous technological innovation and development of appropriate technology and technology transfer; b) reverse engineering and creative imitation of competitors' new technology, c) technological upgradation and progressive mechanisation of traditional, low-tech SMEs; d) technical training and extension services for entrepreneurs and workers; e) development of science and technology parks around research institutes and technical universities to create more technological access for SMEs.

Marketing competitive growth requirements, among others, relate more to: a) promotion of international and domestic subcontracting; b) development of Business Intelligence Service Firms, which may be in the private sector or affiliated with metropolitan and district chambers; c) promotion of franchising and joint ventures.
NEW IDEAS AND APPROACHES FOR COMPETITIVE DEVELOPMENT OF SMEs AND GERMAN-BANGLADESH COOPERATION

A wide spectrum of new ideas and approaches for competitive growth of SMEs and possible German-Bangladesh cooperation has been suggested in this chapter. The ideas expressed here are primarily of explorative nature, and need further critical examination and analysis to assess their short-term and long-term implementation rationale and viability by GTZ and other development partners. Selected issues on technological competitive growth of our SMEs and technological cooperation is the dominating theme and focus of this chapter. Such SME development thinking and cooperation reflects adequately one of the major elements of the Vision of Industrial Development outlined in Industrial Policy 1999, GOB: "Given Bangladesh's resource endowment, the principle of dynamic comparative advantage means production of labour intensive manufactures with skill upgradation and productivity growth as its cutting edge. This, however, does not preclude the possibility of Bangladesh having a niche of high tech industrial sub-sector that may be externally competitive". (Ibid., p.2)

6. Suggested Technological Cooperation Between Bangladeshi SMEs, GTZ and German Business Firms

i. Promotion of indigenous technological innovation, development of appropriate technology and technology transfer

Most of our SME sectors are traditional and low-technology-based. Strategy to implement "high-tech packages" in the
traditional SMEs would amount to "triple technological jump" which can not be sustained (Haque, 1992, p.67). Even successful replication of western technological packages of standard sizes would be difficult in the traditional and rural off- firm SMEs (Ibid.). Indigenous technological innovation can be very effective and highly replicable in Bangladesh as shown by the experiences of Treadle Pump innovation case.

Indigenous Technological Innovation : The Case of Mr. Dev

"The Case of business expansion based on indigenous technological innovation is the story of Mr. Dev. of village Ulipur, Kurigram district and his innovation of treadle pump. It is simple, highly productive and low cost ($30) irrigation equipment appropriate to the local socio-economic conditions and rural settings of Bangladesh (Haque, 1992). Treadle pumps are currently produced by International Development Enterprise (IDE), a US based appropriate technology marketing NGO. IDE invested US$1.5 million into the overall development of treadle pump technology and its delivery mechanism (Ibid.). IDE estimate showed that each one dollar invested produced a return of US$100 to the marginal farmers using this irrigation equipment (Ibid.). Currently, more than 6.5 million marginal farmers in Bangladesh are using this equipment".

Development of appropriate technology is possible either indigenously or through meaningful transfer and adaptation of technology from Germany or from other countries. JICA conducted a study on development of small-scale industries in Bangladesh in 1980. This study suggested the establishment
of an organisation for development and transfer of production technology for small industries in Bangladesh (JICA, 1980, pp.23-27).

Bangladesh has already an existing network of organisations for the promotion and transfer of technology which include: a) Bangladesh Council of Scientific and Industrial Research (BCSIR); b) Institute of Appropriate Technology (IAT), Bangladesh University of Engineering and Technology; c) Bangladesh Industrial and Technical Assistance Centre (BITAC); d) Bangladesh Standard and Testing Institution (BSTI); e) Bangladesh Small and Cottage Corporation Institution (BSCIC); f) Central Extension Resources Development Institute (CERDI); g) Bangladesh Agricultural Research Institute (BARI), etc. None of these organisations are considered to have the requisite capacity to effectively promote, develop and transfer technology required for competitive technological development of SMEs in Bangladesh. Establishment of a Production Technology Development Centre for SMEs with German collaboration can contribute to competitive technological development and more sustainable growth of Bangladeshi SMEs. JICA developed the concept and operational details of their suggested Production Technology Development Centre (PTDC) in Bangladesh almost 20 years ago, but subsequently abandoned their plan of its development. JICA study identified the following functional activities of PTDC: a) demonstration of production; b) on-the-job technical training; c) technical consultancy and advisory services; d) R & D and prototype development; e) technology extension services and f) supply of specific parts and components (JICA, 1980, pp. 23-25).
JICA also recommended the establishment of PTDC in three stages. First stage included the establishment of product demonstration and technical training operations, the second stage included the establishment of technical consultancy and advisory services as well as the supply of specific parts and components (Ibid.). Development of new products and production technologies were included in the third stage of PTDC expansion (Ibid).
In Case of transfer of technology from Germany or other industrialised countries, our SMEs should also meaningfully adapt and use relevant experiences from developing countries.

ii. Reverse engineering and creative imitation of competitors' new technology for non-traditional, modernised SMEs

Reverse engineering refers to meaningful copying and creative imitation of competitor's new technology from abroad or at home, which can be faster and cheaper for product development and diversification. That is, knowing the technological secrets of competitor's innovative products has given rise to what is termed as reverse engineering. Dholoai Khal engineering workshops and enterprises operating in Jinjira are some examples of indigenous reverse engineering. Reverse engineering techniques are highly developed and widely practised in Japan, Hong Kong, Taiwan and some other countries.

iii. Technical upgrading and progressive mechanisation of traditional, low-tech SMEs

Technological obsolescence is an important constraint to the growth of many traditional SMEs. HIID study showed that majority of industrial sectors experienced very little or negative productivity change (HIID, No. 19). Azim in his study on handloom sector in Bangladesh found that technologies used in this sector are primarily traditional and obsolete, which constitutes a serious threat to its existence (Azim, 1988, p.1). He found that handloom sector products can not compete with
the products from local mechanised textile sector and with those imported from abroad. The manufacturing process is slow, and the take-up and let-off mechanism of traditional handlooms are robust and inaccurate (Ibid.). Progressive mechanisation of traditional handloom enterprises is considered necessary for their survival and growth.

iv. Technical training and extension services

A number of studies in Bangladesh clearly show that lack of technical know-how and skills of entrepreneurs and workers is a serious problem for SME growth. Various types of skill-based and need-based technical trainings are required for our SMEs entrepreneurs and workers. The experiences of RD-12 Project in North Bengal show that training for micro-entrepreneurs need to be tailored more to the needs of the market as well as technically upgraded to facilitate dynamics and linkages in the rural off-farm industrial sector (Huda et al., 1988, pp. 2-5). Different types of technical extension services are also required for the SMEs. These can include counselling on choice, sourcing, procurement of technology and machinery, provision of testing services, machinery and spare parts, etc.

v. Creation of more technological access through development of science and technology parks

A serious gap exists in our country between technical research institutions, universities and the SMEs. Specialised science and technology parks can be cost-effectively created in the existing premises of research centres like Bangladesh Council for Scientific and Industrial Research (BCSIR), or in
the technical universities/institutes like Bangladesh University of Engineering and Technology (BUET), Bangladesh Institute of Technology (BIT), etc. Chamber and GOB in association with BCSIR, BUET and BITs, can undertake a pilot testing project for this purpose. Industry-university linkages can be strengthened and institutionalised through efforts and initiatives of chambers, GOB and the universities to utilise the untapped technical knowledge and skills of the academicians to the benefits of SMEs.

7. Other Forms of Cooperation

For creation of new business opportunities and more market access for our SMEs, the following forms of cooperation between Bangladesh and Germany can be actively considered:

i. Strengthening of business information dissemination and development of business intelligence service firms to create new business opportunities and market access

Information is capital. Maldistribution and inadequate use of business information is an important growth impediment for our SMEs. Attitudes towards dissemination and use of information have been changing so rapidly that we have to reset our thinking pattern about information capital. Our SMEs need to be involved more in using business information effectively to create new platforms and opportunities for growth at home and abroad.

Increasingly competitive challenge from market, trade liberalisation and increased globalisation have created "un-met
demand" from our SMEs for the provision of competitive business intelligence services. Unfortunately no firm providing such business intelligence services for our SMEs is known to exist in our country. A feasibility study conducted by the author on the establishment of such a Business Intelligence Service firm shows that investment requirement for such an establishment is quite low (about Tk. 10 million for an efficient firm size), and also they appear commercially and technically viable. GTZ/BAS and DCCI can actively consider setting up a Business Intelligence Service Firm which is quite implementable in the near future, and it can strengthen more business cooperation and partnerships between Germany, Bangladesh and other countries.

ii. Promotion of international and domestic subcontracting

Industrial subcontracting can be an effective SME development strategy in Bangladesh. Subcontracting consists essentially of technical components, i.e., relate to product, product components or process subcontracting between two or more firms on agreed terms and conditions. Subcontracting can contribute to:

a) increased production efficiency and capacity utilisation and specialisation for small subcontracting firms;

b) getting technical assistance from parent firms in product design, quality assurance and control;

c) technology transfer between large parent and small subcontracting firms;

d) increased cost reduction and foreign exchange savings;

e) increased marketing efficiency (Mannan, 1996).
Subcontracting is widely practised in garments sector and has gained importance in light engineering sector (Ahmed, 1990, pp. 35-37; Mannan, 1996, p. 10). Desh Garments, the pioneer export garment manufacturer in Bangladesh, started its operation as a subcontractor of Daewoo Industries of South Korea (Ahmed, 1990, p. 35). The findings of BER\textsuperscript{1} study showed that 30 percent small garment manufacturing units maintained subcontracting relationship with larger firms (Ibid.). A study conducted by the author in mid 1997 on 27 small garment units show that 17 (63\%) practice subcontracting relationships with local large garments units. Major subcontracting items include shirts, T-shirts, shorts, trousers, etc. GTZ/BAS and German-Bangladesh Business forum members can promote sub-contracting between German firms and Bangladeshi SMEs especially in garments, Information Technology, leather, footwear, and handicraft sectors. Current subcontracting practices are also accompanied with certain problems like quality assurance, timely delivery, etc. Also subcontractors' profit margin has been reduced to a low level in recent times.

iii. Promotion of franchising and joint venture

Franchising and joint ventures create access to foreign technology market. Franchises exist in many forms, Business Format Franchising, one of the most widely recognised franchising methods, represents an overall method of doing business, and includes a marketing plan, process assistance, documented and enforced procedures, and business development and innovation (Bygrave, 1997, pp. 363-364). It represents a complex relationship than franchising solely for
product distribution (Ibid.). Coca-Cola, Pepsi, McDonald are examples of franchising. Prospective franchising opportunities exist for our SMEs and German counterpart firms in fast food and soft drink sectors. Joint venture opportunities for our SMEs exist in several business sectors. Chamber and other business promotional institutions can assume more active role to increase such business collaborations for our SMEs.

IV
CONCLUDING REMARKS

German co-operation for development of SMEs in Bangladesh constitutes one of the themes, though not the dominating one of this paper. Inaccessibility to requisite data on German development assistance to Bangladeshi SMEs constrained the effort to handle this cooperation theme reasonably. The author intends to further develop and analyse the relevant issues of German development assistance for SMEs in Bangladesh.

Competitive growth of Bangladeshi SMEs is the dominating theme of the paper. A wide range of ideas and approaches, which are not exhaustive, are suggested for further critical investigation to assess their implementation viability.

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