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DEVELOPMENT OF BANGLADESH: MOBILIZATION OF LAND, WATER AND HUMAN RESOURCES

Introduction

Bangladesh - the land of sublime grace, is no longer considered as a land for fortune-making. It is now one of the poorest and least developed countries in the world. The per capita income is barely US \$ 160.¹ Bulk of the population live below the subsistence level. Almost half of the country's labour force is unemployed while labour productivity is low because of limitations in land area and other complementary resources as well as low levels of skills. In addition, floods which have now become an annual event cause serious damage to the poor economy.

The economy is dependent largely on foreign aid and grants. Its people, although millions in number, failed grossly to form a productive human capital. Since the country's inception, its population has soared upto 110 million from 75 million only in 1971. Poverty, illiteracy and underdevelopment continue to persist. Billions of dollars pumped into the economy from abroad failed to produce any significant result. Besides, indigenous resources are also to a great extent lost in the inefficient process of their mobilization for building the nation—state. The net result, therefore, has been the

1. World Bank, "*World Development Report*," 1989.

stagnation of the national economy and widening of the income gap between the minority rich and the majority poor.

Since independence, the country's narrow export base and extensive import requirements have continued to widen the trade deficit. In spite of increased export earnings and remittances in recent years, trade deficit grew faster than before because of larger food grain imports and a more or less continuous fall in the value of Taka. However, before the record-breaking floods of mid-1987 and September 1988, the economy appeared to be promising as some of the government's structural adjustments were beginning to pay off. In 1987, real GDP growth was 3.9 per cent and in 1988, 2.8 per cent; growth in the non-agricultural sectors more than offset a slowdown in agriculture.² The floods were major setbacks to the country's developmental efforts in the sense that the priorities set earlier for development of the economy had to be changed for the restoration of productive capacity and physical infrastructure.

Under the prevailing circumstances, the overall picture of Bangladesh economy and its trends do not appear to be very encouraging. There are several major obstacles, notably high rate of population growth, inadequate human capital, backward agriculture, rural underdevelopment, narrow industrial base, natural calamities, etc. that need to be overcome within the shortest possible time for the purpose of setting the economy free to move toward achieving self-reliance and self-sustained growth.

In view of the above, an attempt will be made in this paper to review the potentials for development of the economy by mobilization of selected key indigenous resources. From this perspective, aspects of the rural economy will be discussed first, where focus will be on increasing the productivity of land, safeguarding the large sub-sector of subsistence farming, improvement of agricultural extension service and rural industrialization. In the second section, management aspects of natural calamities, i.e. floods and droughts are discussed

2. Asian Development Bank, "*Asian Development Outlook 1989*", p. 105.

in light of the magnitude of the problem. Here, options available for harnessing of water resources are examined critically while expected benefits from water management are pointed out as well. Thirdly, problems and prospects for formation of human capital, followed by a discussion on benefits and strategies for control of high population growth rate, are reviewed. Finally, the observations are noted in the concluding section.

Modernization of the Rural Economy

Bangladesh economy is dominated by a large rural economy characterized by low productivity of the pre-dominantly subsistence agriculture, huge unemployment, higher population growth rate and consequent rural poverty. Low productivity in agriculture is the resultant factor of traditional technologies, increasing pressure on limited land, and poor institutional facilities at the grass root level to support development activities in the society.

The desired development of the rural economy depends, inter-alia, on the quality, vigor and outlook of the people and the social conditions under which they live. The people in rural Bangladesh have proved themselves, under stress though, that they are energetic, industrious, and adaptable to new ideas of techniques, by raising the food production significantly and facing boldly the consequences of natural disasters in recent years. However, it is often argued that they are less enterprising and less ambitious, which could be partly true in the sense that the scope and opportunities had been inadequate. Education and training, health, and other institutional facilities are poor in rural Bangladesh. As a result, entrepreneurship did not develop there satisfactorily. Wide-spread poverty, illiteracy and malnutrition are the main obstacles to rural development. Until these conditions of living are improved, nothing significant is expected to emerge. This objective is achievable only through raising the income level, for which development of agriculture is essential. A bottom-up

development strategy as such, should as well widen the scope for popular participation.³

Modernization of agriculture induces the development of non-farm activities in the rural areas. It creates an environment in which demand for other goods and services increases and which in turn, attracts capital in the production of non-farm commodities. Higher demand for the products of small and cottage industries is correlated positively with the increase in rural income. Experiences suggest that rural investments are undertaken largely by the rich farmers, and occasionally by the government while propensity to save and invest is negligible among the majority small farmers. Characteristically, they consume more which in fact helps accelerate the formation of effective demand for goods and services as the level of rural income goes up. On the other hand, the rise of living standard and availability of more time are conducive to releasing child labour for schooling.

In view of the above, there are essentially two avenues to develop the rural economy of Bangladesh: development of agriculture; and promotion of non-farm activities, i.e. rural industrialization. These two are in fact mutually interdependent in the sense that each has a role to play in serving broader goals of national integration, economic justice and social well-being.

a. Increasing the Productivity of Land

Agriculture dominates the economy of Bangladesh, accounting for about half of the GOP, three fifths of employment and most of the domestically produced inputs used by the industrial sector. Since the country's inception in 1971, the economy moved from near stagnation to the one in late 1970s and early 1980s when agricultural production increased significantly. By 1988, the economy was supporting almost 50 per cent added population compared to that in 1971.

3. Popular participation in this context is understood as sensitizing people and thus helping increase the receptivity and ability of rural people in receptivity to development programmes, and encouraging their initiation at the grass root level.

In the late 1970s, and particularly in the early 1980s, growth of the economy was fostered by major policy changes at the macro level. The new industrial policy was put into effect, and substantial portions of the agricultural input delivery system was privatized. Moreover, land reclamation and its development, storage and distribution of water through excavated canals, land reforms (to a limited scale though) and redistribution, etc. contributed significantly to the increase of agricultural production. However, to offset the benefits of increased production in the past decade, population grew noticeably. The situation was further aggravated by natural disasters, floods in particular, which inflicted severe damages to the national economy. Agricultural production suffered enormously from the effects of devastating floods in 1987, and 1988 in particular.

The effects of high population growth and natural calamities had been disastrous in terms of achieving self-sufficiency in food grain production, generation of employment and alleviation of poverty. As a result, importation of food grains continued despite significant increases in the production. During 1984/85 fiscal year, for instance, imported food grains made up for 47 per cent of marketed food-grains.⁴ Importing foodgrains in such large volumes has discouraging effects on domestic production through lowering the price level. It retards the potential, for raising the income and promotion of employment opportunities in the agricultural sector while acceptable technology and resources are available in the country. It is argued that with proper policy programming and adequate input delivery and output disposal mechanism, the country could have reasonable degree of self-reliance in foodgrains and food security for the population.⁵

The key factors which contributed into the increased agricultural output are numerous, among which, introduction of better quality

4. Dr. Mushtaq Ahmed, "*Bangladesh Agriculture - towards self sufficiency*" Dhaka: (External Publicity Wing, Ministry of Information, 1988), p. v.

5. *Ibid.*

crops, e.g. high yielding variety (HYV), increased use of chemical fertilizer, and expansion of irrigation, in particular, are the most notable ones. Irrigation now covers more than 20 per cent of the total cultivated land area in the country while modern agricultural irrigation accounts for two-thirds of the irrigated acreage. Experiences suggest that further expansion of the modern irrigation system could significantly raise the production level. Studies undertaken in this context indicate that 'output increases by as much as 182 per cent whereas gross value of output goes up by 135 per cent with the introduction of irrigation'.⁶

Introduction of better quality crops has many spillover effects. Firstly, its productivity is twice than that of the local varieties; and secondly, possible effects of natural disasters are less. The argument is strengthened in the last few years by the fact that the Boro crops survived despite drought. In fact, production of Boro increased further despite a prolonged drought in 1989.

As far as employment is concerned, better quality paddy crops promise new job opportunities in the agricultural sector. It is 45 per cent more labour intensive than the local one. On the other hand, cost per maund of production is 35 per cent less while cost of ploughing decreases by 45 per cent.⁷ However, better quality crops require extensive irrigation facilities, more fertilizer and insecticides. In monetary terms, costs incurred in the production of better crops is 1.7 times more; but profits derived is 2.2 times higher per acre.⁸ It is envisaged that even in the absence of agricultural input subsidies, adoption of better quality paddy crops would remain profitable.

It has been seen that share-croppers and small farmers as well often go for more productive "Ufshi" paddy and wheat provided that irrigation facilities exist. Indeed, they often pay more for water,

6. *Ibid*, p. 153.

7. Syed Ali Kabir, "Green Revolution in Bangladesh" (in Bengali); *Dainik Sangbad*, 9 September 1989, p. 2.

8. *Ibid*.

labour and working capital. They buy water from owners of pump machines, employ labourers at a higher wage rate when family labour becomes inadequate during the peak time, and borrow from local money-lenders at a higher interest rate as they rarely qualify for formal institutional loans.

Usage of new technologies and modern devices has also effects on labour market. Those who have successfully increased their incomes by using new techniques in production, reportedly prefer leisuring more than working harder. As a result, supply of labour shrinks. While on the other hand, demand for labour increases with the modernization of agriculture pushing the wage rate higher. Although the argument yet remains to be tested empirically, experiences suggest that the rural labour market, at a sluggish rate though, is gradually evolving in a similar fashion.

Chemical fertilizer is an important component of modern crops production technology. Only in the early sixties, a limited use of fertilizer began in Bangladesh, which reached 22 kg/acre of cropped area in 1984/85. The pattern of fertilizer use has been associated with that of the kind of seasonal crops. It has been found that 88 per cent of fertilizer is used in the production of cereals, i.e. wheat and rice. While it is found that the intensity of fertilizer use is much higher for HYVs compared to local varieties. Some studies suggest that intensity of fertilizer use and irrigation is higher on the smaller farms while other studies suggest that fertilizer application followed the growth pattern in irrigated acreage and adoption of HYV seed technology.

Despite the fact that the use of fertilizer in Bangladesh increased by more than 86 times during the 1960-86 period, its per acre use still remains low compared to that of developed countries. For instance, acre usage of fertilizer in Western Europe averaged 90 kg in 1980, and as much as 110 kg in South Korea in 1982.⁹ Productivity in these countries is also significantly higher compared to Bangladesh.

9. Dr. Mushtaq Ahmed, *op. cit.*, p. 86.

From this perspective, potential for increased production through extensive use of fertilizer is enormous. In addition to this, the favourable climatic conditions, fertile soil and availability of vast water resources which remains yet to be tapped, promise an encouraging prospect for agriculture in the country.

The government has concerted its efforts to a large extent into the production of food and achieving self-sufficiency. But in practice, the result has not been satisfactory as seasonal floods and drought cause serious damages to crops. It is suggested, in view of past experiences on the basis of proven results that production in the dry season is safe provided the supply of water is made available.

In rural Bangladesh, the number of small farmers is large. But as a group, they own only 20 per cent of the irrigation equipments while large farmers own about half of the total. The small farmers use only 13 per cent of the BADC machines and 26 per cent of the cooperatively owned machines, large farmers on the other hand use more than 50 per cent of BADC machines and half of the privately owned machines.¹⁰ The main reason for lower use of BADC machines by small farmers has been the high rent charge. For a greater realization of production, accessability of small farmers to more irrigation facilities need to be ensured. Formation of more cooperatives and support of the concerned agencies could play an instrumental role in the expansion of irrigation. It is expected that with better management, the already available tubewell facilities will be able to irrigate about double the area over the present 2.7 million acres.¹¹ Irrigation, being the lead factor in HRV-fertilizer hydro-technology, could thus contribute immensely into the realization of increased agricultural production in the country.

Existing water supply, i.e. irrigation facilities largely cover only Irri and Boro projects in the country. As a result, 80 per cent of the total arable land remains unirrigated. However, the irrigation

10. *Ibid*, table 9.11, p. 153.

11. *Ibid*, p. 154.

expansion programme has continued, and in the current 1989-90 fiscal year, 4000 deep tube wells (DTW) are to be installed.¹² It has also been learned from the BADC sources that further 1800 DTWs are planned to be installed in 49 districts under the North-West Village Development Project financed by IDA.¹³ In the light of experiences as such, it appears that the Government has adopted the conventional strategy for the purpose of irrigation. The Master Planning Organization (MPO) of the Ministry of Irrigation and Water Resources has also suggested the same, i.e. extensive use of DTWs and STWs throughout the country, which apparently seems conducive to the national drive for increasing the productivity in agriculture. But experiences suggest that expansion of the irrigation network in this fashion is not desirable as other problems are generated in the process.

It has been experienced that the level of ground water is lowered due to extensive irrigation by using STWs and DTWs, in particular. As a result, acute shortage of drinking water is reported in many areas. In addition to this, other tube wells and pumps are also made ineffective, which operate on a limited scale, as the water level goes beyond the reach of such machines' power. Even the STWs are also reported to have been closed in some areas where DTWs are used extensively. Such results give rise to uncertainties about the ultimate consequences of a conventional irrigation network to-be spread all over the country.

In view of the above, alternative thoughts emerge with regard to the feasibility and prospects for harnessing of surface water for the purpose of irrigation. More than 85 per cent of the total land area in Bangladesh is flat alluvial plain crisscrossed by the mighty Padma, Meghna, Jamuna and their innumerable tributaries and distributaries. It is, therefore, argued by many whether there is any rationale in

12. Ahmad Munir, "Give Priority to Expansion of Irrigation" (in Bengali); *The Daily Inqilab*, 4 August 1989, p. 5.

13. *Ibid.*

using ground water while we have the option to harness surface water in the country.

Monsoon water could be stored in rivers, particularly the smaller ones for irrigation purposes in the dry season by using sluice gates. This option involves large amounts of capital expenditure, which is justified in the context of long-run national interests. Moreover, costs involved in dredging the rivers selectively and excavating the canals, would perhaps be smaller than that of installing thousands of DTWs and STWs. This alternative irrigation strategy deserves to be tested on experimental basis for justification of introducing any fundamental change in the formulation of national irrigation, and flood control and drainage (FCD) policies.

It is estimated that at present 20 per cent of the net cultivated area is covered by FCD, but unfortunately it did not lead to any greater use of modern technology, nor increased the production significantly. This has been the result of inadequate feasibility studies that ignored geomorphological aspects, lack of efficient operation, and mismanagement of the projects after completion. If the shortcomings as such could be overcome, things should change increasing the production in the areas covered by FCD.

b. *Helping Them to Help Themselves*

Modernization of agriculture is viewed to have a serious impact on the pattern of rural income distribution. For instance, it has been seen that rich farmers became richer in villages where 65 per cent of the arable land area is irrigated. Dr. Hossain found that 20 per cent of the farmers classified as upper or rich farmers benefitted most while the middle size farmers accounting for 40 per cent of the total just maintained their income level; and for the rest 40 per cent small farmers and share-croppers, the income level has in fact declined.¹⁴ However, the income of all the farmers combined, has been higher than before.

14. For details, see Dr. Mahabub Hossain, "*Problems and Prospects of Rural Development in Bangladesh*," in Bengali, Dhaka: BIDS, 1986.

Bulk of the agricultural activities in the country is carried out at the subsistence level. As a result, no significant amount of surplus is generated that could be expended in the sector itself for its modernization while continuous flow of new financial resources is essential for the sector's overall development. Adoption of new technologies and modern devices involves capital expenditure, which the vast majority of small farmers and share-croppers lack.

Financing agricultural and other related rural activities in the country had been traditionally insignificant and inefficient. Channelling of international credit into this sector is less than 7 per cent of the value of gross agricultural product.¹⁵ The more the credit is distributed to agriculture, the more the repudiations and failures in recovery are reported. However, at the non-government level, the result is found to be satisfactory. For instance, performance of the Grameen Bank in rural areas has been encouraging. Its loan recovery rate is 98 per cent, which proves that the government agencies lack efficiency and commitment.

Small farmers do not have easy access to credit facilities. Bangladesh Krishi Bank (BKB) whose share in the institutional credit market is over 50 per cent showed that in 1981, the share of large loans increased to 36.5 per cent from 20 per cent during 1979-80.¹⁶ Those loans (above Tk. 20,000) are usually given to large farmers, who constitute around 5 per cent only of the farming community. While small farmers, who constitute the bulk of the community, do not have easy access to loan facilities extended by the government. Therefore, it is of crucial importance that the agricultural finance is reorganized in such a manner that more credit is directed towards the small farmers and share-croppers. The existing loan procedure should be simplified enabling them to benefit from it. And furthermore, the whole system need to be reorganized so as to ensure efficiency with respect to distribution and recovery of loans in due time.

15. Asian Development Bank, *op. cit.*

16. Dr. Mustaq Ahmed, *op. cit.*, p. 156.

In view of the above, safeguarding the interests of small farmers and share-croppers is essential. The foremost problem is the issue of landlessness. As the rich farmers get richer, their hunger for more land is increased, to which many poor farmers eventually succumb. To appease this hunger, effective policy measures need to be devised and implemented for diversification of the rich farmers' interests in non-farm activities.

c. Agricultural Extension Service

The drive for modernization of agriculture is much associated with the agricultural research and extension service (AES). AES is perceived as a non-formal educational service outside the formal schooling system, which offers necessary training and assistance to the farmers and their families for adoption of improved practices in crops, livestock, farm management and marketing. The underlying motive of the service is to change the attitude of the farmers, which will allow them to undertake and explore the means to improve the standard of living on their own initiative. However, experiences suggest that the AES is essentially confined to the welfare of rich farmers who are known as contact or progressive farmers under the existing Training and Visit (T&V) system of agricultural extension work. The vast majority of the remaining extension clients are virtually uncovered by the service.

The primary objective of AES is to bring about overall development in the rural society. In Bangladesh, roughly about 80 per cent of the total population is directly or indirectly dependent on agriculture, majority of whom are small farmers, share-croppers and landless. But the AES has so far failed to mobilize popular participation resulting in unequal or unfair distribution of its benefits. For greater national interests, therefore, a political and legal framework for AES is deemed necessary, without which it is not possible under the existing conditions to ensure a more equitable distribution of income generated by the development of agriculture.

Illiteracy is much more wide—spread in rural Bangladesh. Farmers are not conscious enough to realize their own problems and necessities. This has been the main reason why the government-sponsored literacy campaign failed to generate any effective result. In view of this, the foremost task of AES should be to emphasize on motivation and awareness—building among the farmers and rural people. The government should prepare an effective literacy plan compatible with extension strategies to educate rural people, so that critical awareness is created among them with regard to farming and their social life.

Ensuring popular participation in the AES is a precondition for achieving the desired objective of agricultural/rural development, because more than three-fourths of farmers in the country are poor. Their rights to participate are disregarded in matters and issues which determine their destiny. The power structure in rural Bangladesh is such that the minority rich dominates the vast majority poor in all spheres of life. The power relationship did not change despite political and/or administrative reforms undertaken at different times in the past.

To achieve the desired goal of development, the AES should encourage people's participation in the process of planning, execution and evaluation of agro-based development projects which have effects on rural life. Otherwise, the AES would rather help widen the income gap, worsening the sufferings of millions and serving only the purposes of a rich rural minority.

d. Rural Industrialization

It has been observed that over long periods in the process of industrialization, employment in household manufacturing and in small workshops and factories far outweighs that in the large industry, notwithstanding the huge concentration of investment and supporting services in the latter over the past decades. In 1961, employment in all large and medium scale industries taken together in Bangladesh was about 350,000 while combined employment in

small scale industries was 1.61 million.¹⁷ The 1:4.6 ratio was roughly the same in the latter part of 1970s.

During the 1961-80 period, the number of cottage industry units increased by an annual growth rate of 1.8 per cent while employment generated averaged 2.1 per cent.¹⁸ During this period, findings suggest that out of the seven identified cottage industries, agricultural food processing, pottery, and blacksmithy declined while processing of forestry products, handlooms, textile products, and goldsmithy increased. These four categories of industries accounted for 81.5 per cent of the enterprises, and 84.9 per cent of the employment of the cottage industries in 1980.¹⁹

The growth of small scale industries had been encouraging. During the 1961-78 period, the number of major small scale industries increased by 2.3 per cent per annum while the growth in employment averaged 4.8 per cent.²⁰ At present, "the small and cottage industries account for 45 per cent of manufacturing and employs 78 per cent of the total manufacturing work-force amounting to 2 million people. Estimates indicate that there are around 32,000 small industries and 378,000 cottage industries in the country".²¹

As far as unemployment, vis-a-vis, the issue of raising the living conditions is concerned, the largest feasible development potential in the country lies in its rural industrialization. Having realized the limitations of the agricultural sector, and the disenchantment with the present trend in industrialization, it is deemed necessary to promote non-farm activities in rural areas, namely local manufacturing, trade

17. Naimuddin Chowdhury, "Strategy of Rural Industrialization in Bangladesh", *Bangladesh Journal of Political Economy*, December 1986, p. 82.

18. M. Hossain, "The Small and Cottage Industry Sector in Bangladesh" in Rizwanul Islam (ed.), *Employment Expansion Through Rural Industrialization in Bangladesh Potentials Problems and Policy Issue* (ILO-ARTFP), Bangkok 1985, table 2.1.

19. Naimuddin Chowdhury, *op. cit.*

20. M. Hossain, *op. cit.*, table 2.2.

21. *Bangladesh Observer*, Dhaka, 12 September 1989, p. 5.

and services as a means of providing employment and generating income.

Manufacturing activities in rural areas are usually understood at a much smaller scale. In view of this, small-scale industries in rural areas could help diversification of the rural economy and stimulate income generating opportunities through the creation of new job opportunities. A number of positive characteristics of small-scale industries in rural areas have been identified. Large scale industries usually absorb a large share of the investment but generate only a small number of employment opportunities. While on the other hand, small-scale and cottage industries employ a much larger proportion of the labourers employed in the manufacturing sector.

Bangladesh Small and Cottage Industries Corporation (BSCIC), assigned with the responsibility of promoting small and cottage industries, has been working for quite a long time. BSCIC enclaves are also established at all the greater district headquarters to help facilitate the process. But unfortunately, it failed to produce any expected result. Inefficiency, lack of technical knowledge, inadequate market information, etc. on its part; and lack of entrepreneurship, lack of commitment, lack of skill etc. on the part of the individuals, have been the known reasons, which contributed into the policy fiasco.

However, despite all the shortcomings, the BSCIC in cooperation with UNDP and ILO, and also with DANIDA, conducted studies with regard to identification of viable projects, which raised the question of product quality and design. The studies identified two categories of products for possible development : (i) handicrafts and cottage industries' products for the local market; and (ii) handicrafts for the export market.²² Findings and experiences gathered by the studies suggest that the selection of product grouping within the possible scope for development would appear to be a quite sensible one, in view of the prevailing pattern of cottage industry capabilities,

22. For details, see Naimuddin Chowdhury, *op. cit.*, pp. 98-101.

as also the prospects of where the winners of tomorrow may be sold with relative ease.²³

Despite the fact that some improvements have been made with regard to promotion of small and cottage industries, there still remain too many constraints which handicap the sub-sector's further development. The most pressing need is the facilitation of credit facilities through the easing of long-term lending procedures so that the rural entrepreneurs can expand their industries more effectively.

Easier access to finance will enable the small and cottage industries to generate new employment opportunities in the rural areas and widen its industrial base. Estimates show that an investment of Tk. 40,000 in small industries generates one new employment while Tk. 6000 is required to generate the same in cottage industries.²⁴ However, worth mentioning here is that proper guidance in this regard is a precondition. This is essential for viability reasons that the right industry is selected, for which more research and support services, e.g. training and development of skills, advice on product development and marketing are required to promote and sustain the growth.

In view of the above, a comprehensive development plan for the the promotion of small and cottage industries and development of agriculture incorporating all aspects of rural life should be devised and implemented effectively to juvenate the rural agricultural sector. In addition to this, many attributes to technological innovation and modernization of the economy, for instance, electricity, better communication network, education and training facilities, improved health care, entertainment and amusement facilities, etc. which so far the urban dwellers enjoyed almost exclusively, are to be made available to the rural people.

Harnessing of Water Resources

This is a paradox in Bangladesh that water resources are abundant at times in devastating magnitude and scarce at times when needed.

23. *Ibid*, p. 99.

24. *Bangladesh Observer*, Dhaka, 12 September 1989, p. 5.

The monsoon brings excess water to cause flood, drainage congestion and soil erosion. The floods deposit huge quantum of upstream silts which raise river and canal beds reducing their discharge capability. The recent floods of 1987, and 1988 in particular, which inundated almost three-fourths of the total land area in the country, proved that crops, lives, properties, physical infrastructure and well-built urban areas all are equally vulnerable to overflow of excessive water.

On the other hand, acute shortage of water in the dry season threatens crops, human and animal lives, navigation, and the ecology alike. Reduced flow of surface water induces salinity intrusion affecting agriculture, industry ecological balance. The impact of water scarcity on agriculture, in particular, is devastating. For instance, in the early 1970s, irrigation by Low Lift Pumps (LLPs) declined due to limited availability of surface water, which increased the dependence on tapping ground water for cultivation in the dry season. But experiences suggest that in the coming decades, limits of ground water may threaten the present boom in STWs, and DTWs in particular, before irrigation coverage reaches any significant proportion of the total cropped area.

Other than human resources, water is perhaps the single largest natural bounty of Bangladesh. Its importance in national life can hardly be overemphasized. The productivity of agriculture is constrained by floods during the monsoon when 70 per cent of the food is produced, and by drought and consequent moisture deficiency when irrigation is needed.²⁵ The most decisive factors for agricultural productivity are notably, supply of water for irrigation, maintaining desired water level (drainage control) and conserving water quality (salinity and also population control). Besides, inland water fisheries currently produce 70 to 80 per cent of the total animal protein consumed in the country, while inland navigation accounts

25. See Master Planning Organization (MPO), "*National Water Plan summary report*", Dhaka, December, 1988, p. 1.

for 65 per cent of cargo transport and 38 per cent of passenger movement.²⁶ Furthermore, 85 per cent of the population depend on ground water for drinking and domestic purposes in the dry season.

Development of water resources is however, an issue with multi-faceted problems. In broader terms, the problems could be classified into domestic and external perspectives. At the domestic level, the issue is viewed as a seasonal, spatial and as well as magnitudinal problem while externally, i.e. at the international and regional/bilateral level, the problem is perceived as involving a number of technical, political, and legal issues. The increased intensity of floods in recent years, suggest that a number of factors at all the three levels, i.e. domestic, regional and global, have had their contributions into the causes of flooding.

The domestic factors contributing into the causes of flooding are identified as : (a) criss-crossing network of roads and embankments that are constructed in unplanned and haphazard manner; (b) poldering of low lying areas that results in flooding of relatively higher but unprotected lands;²⁷ (c) increased sedimentation and choking-off in channels resulting from reduced flow of river waters, specially in the Ganges basin.²⁸ The regional factors, on the other hand, are

26. Abdur Rob Khan and Nurul Islam Nazem, "Abundance and Scarcity of Water in Bangladesh: Issues Revisited"; *BISS Journal*, vol. 9, no. 4. Dhaka, 1988, p. 461.

27. The impact of roads, embankments and similar infrastructures may be explained by the fact that while flood levels of the Meghna at Bhairab bazar and Chandpur in 1954 was higher than those in 1974 at those points, area flooded in 1974 was much more than in 1954 because of the fact that poldering of lower areas resulted in flooding of much more unprotected higher areas. See Mohammad Maniruzzaman, "Flood Problem in Bangladesh and Its Remedies," unpublished paper in Bengali, Dhaka, October 1988, reported in Abdur Rob Khan and Nurul Islam Nazem, *op. cit.*

28. Abdur Rob Khan and Nurul Islam Nazem, *op. cit.*

mainly the deforestation in the Himalayan region, melting of snows by using chemicals, and reduction of increased water pressure at the Farakka dam by opening-up its sluice gates while among the global factors, the effects of substantive atmospheric and climatic changes including the so-called greenhouse effect that results in melting of increased snows have been the oft-mentioned ones.

However, the major factors contributing to the recurrence of floods could be indentified as : (a) the huge catchment area which is 12 times bigger than the country itself; (b) geographical location; (c) relief and topography including the flat terrain; (d) low gradient of the rivers which average at 3 inches per mile;²⁹ (e) sedimentation of channel with about 2.4 million tons of silts that come down from the upstream; (f) pondage effects created by tidal flow and monsoon winds' pressure that reduce slope and discharge flow of water into the Bay of Bengal; (g) frequent meanders in channels; and (h) man-made infrastructures.³⁰

To deal with the floods, the foremost question, which arises is how the problem could be resolved meeting the national aspirations for development of the economy. In this context, two basic options are available. Firstly, controlling the floods; and secondly, living or adjusting with the floods. The first option involves huge amounts of capital expenditure, in addition to participation of other neighbouring countries. Under the existing conditions in the region, this appears to be not attainable, at least in the immediate perspective. Therefore, the desired alternative is to learn to live with the floods and at the same time, to implement some selective control measures. The approach of living with the floods suggests the increasing of flood containing and discharge capability of the channels, strengthening the flood preparedness and changing the cropping pattern, human settlement and life style accordingly.

29. Morgan and McIntre, "Quaternary Geology of the Bengal Basin, East Pakistan and India" : *Journal of the Geological Society of America*, quoted in Abdur Rob Khan and Nurul Islam Nazem, *op. cit.*

30. Abdur Rob Khan and Nurul Islam Nazem, *op. cit.*, p. 465.

The national strategy to deal with floods has been controlling through constructing structures. But experiences suggest that haphazard empoldering of flood-affected areas on small and medium scale rather intensifies flood and delays recession of water. Existing flood control schemes, except perhaps few, do not provide for controlling internal accumulation of waters during monsoon when the level of outside water is higher than the level of internal water. This brings in the concept of on-farm management of water resources, a concept usually applied in the case of irrigation during the dry season. It is argued that flood control projects might have provided crop security, but in most cases they have not been able to raise agricultural productivity, one important objective of the flood control projects.³¹ The most meaningful query, challenging the traditional strategy of controlling the floods is that whether the costly measures taken in this regard could produce any positive impact at all on the devastation of recurrent floods. In the light of experiences, many would argue that expenditures in billions of Takas for construction of flood control infrastructures is unjustified.

The experiences gathered so far in the process of flood control measures raise the question of living and/or adjusting with floods. This alternative strategy puts emphasis on dredging for improving substantially the capacity of accommodating more water in the river channels, which would involve large capital expenditures. Moreover, there is no guarantee that it would alone solve the problem. Therefore, suggestions have been made for selective dredging, validity of which could be established by undertaking a Cost-Benefit Analysis involving average annual potential loss due to flooding with respect to amount of expenditures relieved as flood control schemes are abandoned, navigational and other benefits, e.g. irrigation and fishing.

31. For details see M Moslehuddin and Abdur Rob Khan, "*Study on Impact of Ten Early Implementation Projects in Bangladesh*," vol. I, unpublished, study report prepared for the Early Implementation Projects (EIP), BWDB, 1983-84, reported in Abdur Rab Khan and Nurul Islam Nazem *op. cit.*

To add with, possibility of employing human resources vis-a-vis unemployment in the country also need to be taken into consideration for analysis. Furthermore, the techno-economic feasibility of diverting part of the Ganges flow into Arial Khan and Gorai, and Brahmaputra flow into the old Brahmaputra and Dhaleswari may also be explored in this context.

Another component of living with floods is adjustment of cropping pattern and changing the life style. Adjustment of cropping pattern indicates genetic transformation/adjustment of the main crops, namely, Aus and Amon crops, so that they become flood-resistant. For instance, introduction of long stem HYV paddy could be one such crop, which remains yet to be researched and experimented for further development.

Cropping pattern in terms of timing is another factor which deserves attention. About 70 per cent of the food-grain (Aus and Amon) is produced during the monsoon and of this, 80 per cent is contributed by Amon crop which commands 61 per cent of the cropped acreage.³² And only one-fifth of the total land area cultivated in the lean season is covered by irrigation. Irrigation at present is carried out largely by using ground water, which lowers the water level endangering the operations of LLPs and STWs. Usage of DTWs only is costlier and it poses a threat to the availability of drinking water. Therefore, in the light of experiences, it could be suggested that storage of monsoon and/or flood water in dredged river channels, excavated canals, and other reservoirs could serve the purpose of supplying surface water for irrigation. Other than the rivers and their tributaries, 1.8 million ponds spread over an approximate area of 0.66 million acres, and there are almost an equal number of beels, khals haors, ditches and other water bodies owned by the government³³, that could be renovated and

32. Bangladsh Bureau of Statistics, "Statistical Yearbook of Bangladesh", Statistics Divison, Planning Commission, Dhaka, 1989, table 4.

33. Bangladesh Bureau of Statistics, *op. cit.*

re-excavated to increase their storage capacity for the purpose of small and/or medium scale irrigation projects in the lean season.

As far as regulation of flood water is concerned, some form of control measures are essential with regard to facilitating the overland drainage system, which has been deteriorated and complicated in recent years with the construction of roads and embankments in a haphazard and unplanned manner. As a general principle, the roads and embankments should not be antithetical to the natural slope and direction of the rivers, i.e. North-South. Smooth passage for flow of water has to be maintained and must not be obstructed. When physical infrastructures, e.g. roads are constructed, culverts and pipe sluices should also be provided for, closures should always be avoided unless technical considerations so dictate.

However, as mentioned earlier, there are alternative and conflicting opinions with regard to harnessing of water resources. But under the existing socio-economic and political conditions, the strategy to deal with the floods should be one which is by and large manageable by indigenous means. Dependence on others for seeking a viable solution apparently seems to be frustrating. To be realistic, widening and deepening of major rivers and channels by selective dredging and massive excavation and re-excavation of other channels involving manual labour to the extent possible could be the desired strategy serving best the national interests. There are several thousand miles of seasonal and erstwhile perennial rivers and canals that get dry in the lean season while several thousand miles more remain under shallow water with the outfalls and mouths choked up. These could be re-excavated by employing abundant labour in the country. The rise and expansion of chars (islets) in the major rivers could also be prevented by removing earth and silts using both human and mechanical powers. A national strategy in this regard should help increase the channel capacity of containing flood water, improve navigational facilities and facilitate greatly the expansion of surface water irrigation at much lower running costs.

Under the existing conditions, development of water resources indicates that it is one of the most pressing elements involved in our national development strategy. Water management through well planned measures is of crucial importance as its scarcity or abundance either would create havoc for life, property, economy and ecology of the country. In view of this, harnessing water resources properly is expected to help accelerate the pace of development activities in all spheres of the national economy by making it available at times when required and holding it in control when not required.

Development of Human Resources

a. Formation of Human Capital

Since the late 19th century, technology has become increasingly important as the pace of progress has accelerated with the use of superior motive power and modern energy sources. The outcome was that the knowledge and skills needed by the workers became so extensive and varied that the development of human resources began to assume strategic importance in the growth of productivity in the 20th century industrialization.

The quantitative dimensions of manpower began to be superseded by qualitative factors. Skills and knowledge, rather than manual labour, became the main input into the production process. In Bangladesh today, we have the quantity, but not the quality of labour. It is a paradox that development activities are hindered by an unprecedented growth of population while the economy faces acute shortage of productive human capital and entrepreneurship at the national level.

The sources of conventional knowledge and skills are generally found at the institutions for learning and training, i.e. through formal education. But in Bangladesh, the education system is grossly unproductive. It does not produce the kind of manpower the economy requires. It has retained the typical colonial characteristic of producing largely the unproductive literates. Also the quality of

teaching has deteriorated noticeably. Academic curriculum and standard of education are even below than that of many developing countries. The institutes of higher learning produce quite a large number of graduates each year, which worsen further the unemployment situation for the educated youths. At present, 48.6 per cent of the educated labour force in the country is unemployed,³⁴ and their contribution to the economy of production is marginal. However, expenditure has continued to be increased on education, particularly at secondary and tertiary levels, which have raised significantly the government's recurrent cost obligations. But the system as a whole has failed so far to produce any commensurate improvement in the quality of education. Underdeveloped planning, mismanagement and inefficient administration continue to persist resulting in an ineffective education system in the country. Access to education has only expanded modestly in relation to the growing needs, but the quality is believed widely to have deteriorated.

The Third Five Year Plan confirmed that the system had only expanded marginally and remained elitist in character. It emphasized on the need for reforms including improving the quality throughout the system, restructuring higher secondary and college education, increasing cost recovery, strengthening the management controls, and introducing performance evaluations. But specific programmes to address most of the issues are still lacking. To help improve the conditions, urgent measures need to be taken on priority basis for modernization of the examination system, and making the programmes and curricula more appropriate to the needs. Special emphasis on strengthening the vocational and technical training is equally needed.

The education system in the country is completely oriented to preparing students to advance academically. While such training is useful for some students, there is little attempt to provide more practical skills to those who must drop out of the formal system.

34. Bangladesh TV, "*National Debate Competition*", 31 July 1989.

The Secondary School Certificate (SSC) examination and Higher Secondary Certificate (HSC) examination 'average a 40 per cent pass rate. It is estimated that a further 20 per cent of those enrolled in these two grades do not take the examinations. Repetition in the secondary system is high and degree colleges have an even higher failure rate in their examinations, often less than 30 per cent. In the University system, the pass rate is, however, surprisingly much higher averaging 80 per cent'.³⁵ But, the training the graduates receive does not adequately prepare them for the job market. The quality and/or standard of tertiary education is low and unproductive, which helps complicate further the problem of educated unemployment and underemployment. The crisis is faced largely by the liberal arts' graduates, who numerically dominate higher education at the College/University level.

As far as primary education is concerned, a Directorate has been established, under which field supervision, personnel management, teacher training, curriculum development, textbook supplies, and construction and maintenance of school facilities have begun. But, the situation remains yet very frustrating. Experiences suggest that unless the reforms initiated in primary education are expanded and developed, the system will not only remain very wasteful, but will fail in its primary task of providing basic literacy and numeracy to a broad segment of the population.

In an academic environment explained as above, it can not be expected without large-scale reforms that the institutions for higher learning in the country would produce fresh blood for the economy. The system as a whole is not only wasting resources, but also commits a gross injustice to the nation. Under such depressing conditions many would find it hard to agree that there is no need to establish new Universities under the same system to aggravate further the problem of unemployed educated youths. This is an illusion.

35. For details see World Bank, "*Bangladesh: Promoting Higher Growth and Human Development*", a consultative study, 1987.

Academic curriculum in developed countries and also in some developing countries are prepared in such a manner as to equip the school leavers for the job market. Most institutions for higher learning in those countries coordinate and maintain strong relations with the sectors of business and industry, which often sponsor and/or contribute to the running of many academic and training programmes. In addition, they also sponsor individuals who pursue higher education or training that interests them. The business community in Bangladesh could also be encouraged to follow this example, provided the rigidity in the system is eliminated and scope for such ventures is increased by the authorities concerned.

Sponsoring higher education for individuals with proven academic records should be encouraged. According to the estimated annual demand and its nature, i. e. diversity for educated manpower in the country, a policy need to be pursued under which an adequate number of studentships could be offered on competitive basis. The beneficiaries, in return, would be liable to serve the government and/or its affiliated organizations for a certain period of time. Furthermore, an interest free loan scheme for qualified students could also be initiated by the banking system under the direct patronage of the national government. A similar programme has been proved useful and quite effective in Turkey.

At the secondary level of education, more vocational and trade institutions need to be established. It is worth mentioning here that everyone is not expected to pursue a tertiary education. Considering the conditions of the economy and its underdeveloped infrastructure, there is a growing need in Bangladesh for trained manpower at the field level. In view of this, an efficient career advisory service (CAS) is essential in the country. Members of CAS would visit all the primary and secondary schools or, alternatively a number of permanent posts for career advisors at each and every Upazila could be created. The advisors, in consultation with the teachers about the performance of students, would decide whom to be approached for training on skill development in specialized training institutes. The

suggestion may appear to be ambitious, but in view of the fact that money is wasted in millions, this could be implemented to generate better feed-back results, provided the skill development facilities are strengthened adequately.

However, certain skills can only be learned on workplace, where the appropriate machines and instructors are available. Institutional learning and/or training does not necessarily always equip the school leavers for the labour market. In most of the modern industries, some kind of practical experience is required at all levels. In view of this, the Department of Labour in Britain for instance, introduced Youth Training Scheme (YTS) for the unemployed youths. Under this Scheme, any unemployed youth can register his/her name at the local Job Centre. The Job Centre, which maintains close connection with industries in all sectors throughout the country, locates a suitable apprenticeship (on job training) for the applicant. If s/he accepts the offer, a remuneration is paid by the industry concerned. If completed successfully, the training enhances the prospects for new job opportunities in the same and other similar industries as well.

In Bangladesh, similar policy measures befitting the societal conditions could be pursued for development of human resources. Higher education in the country should be made completely free and remunerative as well for those only who meet the set criteria. However, at the same time, adequate opportunities for a wide range of vocational and technical education should be made available at all levels. Also, introduction of appropriate rehabilitation programmes should complement the whole exercise.

It is essential that complementary policies are introduced in the country to help the young people who successfully complete their training in establishing production and service oriented micro business units. Self-employment models like "bikalpo", introduced earlier in the country for a brief period by the Sonali Bank, need to be developed and implemented through the relevant governmental and semi-governmental agencies. It is also worth mentioning here that

the Ministry of Youth and Sports introduced a somewhat similar programme on trial basis in January 1987 for a period of two years. It turned out to be a successful experiment. The programme called Upazila Resource Development,³⁶ was initiated in Harinakundo and Sadarpur Upazilas in the districts of Jheneidah and Faridpur respectively. Loans amounting to Tk 3,000 each were given to 600 families whose members had or gained the required skill from participating in training programmes organized by the Ministry. The recovery rate of loans and income generated by the beneficiaries had been satisfactory. Convinced by the results, the Ministry has now undertaken a new scheme for introduction of the same in 100 more Upazilas. The government should take such experiences into consideration for appropriate policy formulation that would transform the large unproductive manpower into a productive human capital.

Formation of human capital could also brighten the prospects for increased foreign exchange earnings. Remittances by Bangladeshi workers abroad contribute significantly into the foreign exchange earnings. The country with its vast human resources can explore this potential further by developing the skills of its labour force. If necessary skills are developed, more and more labourers would find jobs in other countries lessening the rate of unemployment and contributing significantly into the capital formation for development of the economy.

b. Population Control for Our Survival

About the alarming population growth rate world-wide, Robert Fox and Carl Haub observed, ..the earth entered this century with less than 2 billion population, will close the century with over 6 billion and will probably reach some where between 8 and 14 billion when population stabilizes-that is, if the ecological system permits

36. For further details see Directorate of Youth Development, Ministry of Youth and Sport, "Upazila Resource Development and Employment Project Credit Manual", Dhaka, 29 August 1987.

this to occur. There has been no change in the expectation for decades, and without radical shifts in values, little likelihood of change in the future.³⁷ An even more frightening picture can be found in the context of Bangladesh. The total population in the country was around 10 million in 1650 A.D.³⁸, which has soared up to around 110 million in 1989, and is expected to rise as high as 130 million by the turn of this century.

Under the existing conditions, high population growth rate has been identified by the Government of Bangladesh as the number one national problem. In view of this, a comprehensive policy was adopted in June 1976, reflecting high priority to population control programmes as an integral part of the development process. However, the demographic goal, expressed in the Second Five Year Plan (1980-85), of achieving a net reproduction rate (NRR) of 1 by the year 1990 still remains far beyond the vision by any standard. The efforts made so far have proved to be unsuccessful.

As a result, high population growth rate continues to retard the development activities. The country is neither endowed with abundant natural resources nor, the level of technology used is satisfactorily high. In such a situation, high population growth implies that (a) a greater proportion of resources is required to feed, clothe, and educate the young, thereby reducing the availability of resources for investment; (b) a greater proportion of investment is required to equip new entrants to the labour force, thereby limiting the extent to which capital per worker can be increased;³⁹ and (c) a larger stock of labour is applied to fixed factors, such as land, resulting in diminishing returns.

High population growth rate has caught Bangladesh into a low level equilibrium trap. It affects the development process in two

37. Robert Fox and Carl Haub, "Population Control In Bangladesh," *Bangladesh Times*, Dhaka, 19 March 1983.

38. *ibid.*

39. Lyn Squire, "Employment Policy in Developing Countries," A World Bank Publication, Oxford University Press, 1981, chapter 3.

ways.⁴⁰ Firstly, it keeps the GNP per capita low. As a result, savings is always less which in turn causes less capital formation. Secondly, as the rate of new entrants into the labour market is higher than that of the rate of new job creation, dependency and unemployment continue to grow, which in turn causes per capita production lower in all sectors. Therefore, it could be suggested that under the existing conditions in Bangladesh, the opportunity cost of population control would be much less than that of its maintenance.

There are, however, social scientists who argue that high population growth does not necessarily obstruct the development process.

Prof. Hirshman, for instance, argued that population pressure creates a counter pressure, which brightens the environment for economic development.⁴¹ Prof. Hansen, likewise, argued that 'population growth creates pressure on economic infrastructure for development and expansion of the communication network, schools and construction'.⁴² However, such arguments are valid till the formation of capital required to sustain the counter pressure is continued. The Bangladesh economy is mired by acute poverty and it is already overburdened by the unprecedented growth of population. Almost half of the nation's labour force is unemployed. Labour productivity in the country is very low in all the sectors and the nation as a whole survives largely on foreign assistance. The overall scenario of the economy, thus, suggests that there is apparently no cost-effective alternative other than controlling the rate of population growth.

In view of the above, there exists a great deal of development potential under the planned population growth. A decline in fertility

40. Mohammad Iqbal Karim, "*High Population Growth and Economic Development in Bangladesh: A Case Study*", Master's thesis, (unpublished), Hacettepe University, Ankara, 1984, p. 16.

41. For details see, Albert O Hirschman, "*The Strategy of Economic Development*," New Haven, Yale University Press, 1958.

42. A H Hansen, "Economic Progress and Declining Population Growth", *American Economic Review*, XXIX, No. 1-5, March, 1939.

is expected to accelerate the process of development in the following ways:⁴³

1. as fertility drops, the young-age dependency falls. With the size of the potential labour force remaining unaffected in the short-run, total output will be as high as it would be in the absence of a fertility decline. But as the given total output is to be distributed among a smaller number of persons, income of persons, income per head rises relative to what it would be, had no fertility decline take place. The once-and-for-all advantage implicit in the transformation of the age distribution is not lost when eventually a new equilibrium state is reached. This is indicated by the comparison of the high and low fertility steady state age distributions;
2. the decline of fertility will result in a deceleration of population growth and eventually in a lower rate of growth than would be the case with maintained high fertility. With a lower rate of growth the efforts required merely to keep the capital stock per head constant will be smaller or, conversely, with a given level of effort the slower growing population will be able to increase capital per head faster than with the rate of growth. The effect will be felt to some extent soon after fertility starts to decline but assumes its full importance once the arrival of the cohorts affected by fertility decline starts to slow down the rate of growth in the labour force ages;
3. it is expected that with higher income per capita, not only savings per head will be larger but also a higher proportion of personal incomes will be saved;
4. the same is true with respect to government expenditures. The relative decline of demand for such government services as

43. Paul Demeny, "The Economics of Population Control"; paper presented for the 1969 General Conference of the International Union for the Scientific Study of Population, London, 3-11 September, 1969, quoted in Mohammad Iqbal Karim, *op. cit.*

- schooling, maternal health, etc. will permit a shift of the structure of public outlays towards more directly productive investments;
5. lower fertility may increase female labour force participation rate;
 6. the gains in income per capita induced by the fertility decline may have a feedback effect on labour force productivity via better nutrition, health, housing, etc.;
 7. in an economy suffering from technological unemployment or underemployment, the absorption of idle manpower will be accelerated by the higher rate of capital accumulation and, later also by the lower rate of labour force growth induced by lower fertility;
 8. in general, achievement of employment objectives pursued by underdeveloped economics, such as, the relative expansion of the labour force absorbed by the industrial sector, will be facilitated; and
 9. the shift in factor proportions implied by a faster rate of growth of the capital stock and a slower rate of growth of the labour force will lessen the pressure for interference in the labour market, resulting in allocative changes toward a more equitable income distribution.

The above benefits are viewed to accrue to the nation, if the rate of high population growth could be curtailed to the desired level. However, to achieve this objective, a crash programme for population control needs to be pursued vigorously. All the available resources, if required, should be mobilized efficiently; and further, more, all development activities other than those which are considered essential and those which are ongoing, could be suspended for a brief period. The task is painful, but the spillover effects are expected to be beneficial in the long-run. As far as population control strategy is concerned, a radical policy and drastic action are essential. Experiences suggest that without such a measure, prospects for achieving the desired rate of population growth in the foreseeable future are frustrating.

A drastic measure would involve loosening of all the traditional and fundamental social values. For instance, assume that Bangladesh has now a population of 110 million, i.e. 18.33 million eligible couples, which in turn implies 18.33 million individual men or women, one from each couple, who could be identified as eligible for adoption of family planning methods. Out of this population, one-third, i.e. 6.11 million could be targeted for sterilization. If, this number of 6.11 million men and/or women is divided into the existing 460 Upazila units, each on average will have a target population of 13,283.

If the government offers an incentive package worth Tk. 10,000 in kind (and a portion only in cash if required), there should not possibly be any shortage of eligible people voluntarily coming forward to adopt permanent methods. In rural areas, for instance, the incentive could be given in the form of writing-off of the beneficiary's debt (to any bank); agricultural inputs; construction materials; loans for income generating activities to be undertaken with others or, individually under guidance from the resource person of the concerned local agency, etc. To complement this, the government may as well develop and offer another deal, like giving preference to those who accepted permanent family planning methods in the allocation of land and shelter under the land redistribution and Cluster Village programmes respectively, training and loans for establishing small and cottage industries, etc.

Moreover, at the same time, incentives and disincentives as mentioned in the official population control policy must also be practiced. Benefits of pursuing a comprehensive population control policy, compared to the costs involved in it, are much higher. Costs incurred under the programme is expected to be much lower than the benefits that would accrue to the government exchequer. It is suggested that "if economic resources of given value were devoted to retarding population growth, rather than accelerating production

growth, the former resources could be 100 or more times as effective in raising per capita incomes in many LDCs"⁴⁴

Conclusion

Despite the fact that Bangladesh is one of the least developed countries in the world and has a population of 110 million, most of whom live below the subsistence level and, in addition, has no significant conventional resource base, prospects for development are not as bleak as perceived by many. It has been reviewed in different sections of this paper that there exists an enormous scope for development of the economy by exploring the potentials in land, water and human resources.

Bangladesh does not have any significant amount of fallow land that could be brought under cultivation. However, the land is extremely fertile, which remains largely under-used in terms of the scientific methods. In view of this, it appears that the only feasible option available is to adopt modern technologies/devices, i. e. expansion of irrigation, use of better quality seeds and more fertilizer, and diversification of crops. In recent years, output in the agricultural sector has increased noticeably by introduction, at a limited scale though, of new techniques into the production. Experiences suggest that the level of production could be increased significantly by extensive use of the modern devices.

Bangladesh economy is dominated by a large rural economy. Potential for development of this traditional sector through rural industrialization is enormous. But so far, the rural industries received least attention. Experiences suggest that there is ample scope for development and expansion of the rural economy by encouraging small and cottage industries. It has been seen that such industries employ bulk of the labour force engaged in manufacturing activities.

44. Stephen Enke, The "Economic Aspects of Slowing Population Growth", *Economic Journal*, 76, March 1966, p. 56.

In the light of the experiences as reviewed briefly in this paper, it could be suggested that promotion of small and cottage industries is expected to accelerate the mobilization of rural resources for generation of new employment opportunities and contribute to increased production, efficiency and diversification of the economy.

Bangladesh is experiencing an unprecedented growth of population, which remains largely unproductive. The economy as mentioned earlier, is mired by poverty and survives largely on foreign aid. Under the existing conditions, it is of utmost importance that the vast unproductive human mass is turned into a capital. Experiences suggest that formation of human capital requires, first of all, a complete reorganization of the whole education system in accordance with the needs and aspirations. However, it is not desired that resources be drained out of the national exchequer to produce unproductive literates to worsen only the conditions of labour market. Access to education is a basic human right, but wastage of scarce resources in the name of higher learning is a gross social injustice. Higher education should be made free and need to be reorganized in such a manner that it ensures the access for those who deserve it. However, for the interim period, the option for increasing tuition and other fees at the higher levels while establishing programmes for 'student aid' (or, remuneration) strictly on the basis of need and merit, deserves serious consideration. In this context, it is worth mentioning here that strengthening of technical and vocational training facilities at all the three levels, i.e. primary, secondary and tertiary, is an essential precondition for any desired reform.

The magnitude of population explosion in Bangladesh has caught the nation into a quagmire. Bulk of the population live below the subsistence level. Capital formation in the country is negligible in relation to the needs, which resulted in near-stagnation of the economy. As a result, despite all the efforts possible under the prevailing conditions, the economy is not prospering at the expected

rate. In such a frustrating situation, control of high population growth is of immense importance. For instance, if the economy is relieved of its obligations for supporting hundreds of thousands of new borns each year, conditions of the economy would certainly improve. Therefore, drastic actions, like the one suggested in this paper, are desired at any cost.