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**Economic Deprivation,  
Erosion of the Resource Base and  
the Imperative for Sustainable  
Development in South Asia**

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**INTRODUCTION<sup>1</sup>**

South Asia is at a conjunctural moment in its history. There is a growing awareness today of its tremendous human and natural resource potential, as well as growing evidence of the undermining of this potential resulting from unsustainable development strategies pursued over the last four decades. Can we grasp this moment, and together devise a new path?

There is an urgent need to move out of the narrow confines of a conceptual approach that takes GNP growth within centralized state structures as the emblem of development, the credit-worthiness for new loans as a measure of economic health, and which regards people as passive recipients of the drops that are supposed to trickle down from such a process. As we glance back to look at the last four decades of the South Asian development experience, generations of poor, mutilated by malnutrition come into sharp focus. At the same time the image of once verdant slopes of our northern mountains and the fertile fields that nestled at their feet, begins to fade. A childhood image that has been lost within a single generation before the onset of deforestation, salinization and desertification—processes unleashed by a growth mechanism that is

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<sup>1</sup> I am grateful to Mr Ganeshan Wignaraja for help in collecting the data, and for useful discussions on an earlier draft. Thanks are also due to Mr Amir Shehzad for help in collecting the data. However I remain solely responsible for the ideas expressed in this paper and for any errors that might remain.

guided by the hidden hand of the market rather than the aspiration of our peoples to sustain life across generations. Yet even as the human and natural resource base is getting undermined, governments in South Asian countries are groaning under mounting debt burdens arising mainly from the rising expenditures of centralized state apparatus, and ill-conceived policies imposed by international financial institutions.

As we now look towards the future, an urgent need is felt today, for a new approach to development. A perspective within which people, in their diverse locations, can acquire control over decisions that affect their immediate existence; in which the autonomy of communities and states can be sought from the tentacles of an international financial system that is serving as a conduit for transferring real resources out of the fragile resource base of the poor; a perspective within which production and economic growth is conducted to sustain life rather than serving to undermine it. In short, the question is, can we achieve a sustainable relationship between man, nature and growth?

In this paper, I have attempted to explore these questions, albeit in a rudimentary fashion. In Part I is examined the resource potential of South Asia and the extent of its degradation. In Part II is presented an outline of an approach to sustainable development through establishing a link between two levels of development praxis: grass roots organization on the one hand, and Regional Co-operation for human and natural resource development, on the other.

## **I. POVERTY, FINANCIAL CRISIS AND RESOURCE DEPLETION IN SOUTH ASIA**

The traditional paradox of South Asia, that of a resource-rich region inhabited by poor people, has been given a new dimension as a result of the development strategies pursued in the post-independence period. The particular form of economic growth initiated by post-colonial elites in this region is such that the very resource potential which could have been harnessed to overcome poverty, is instead, being rapidly eroded. (The form of this growth process is discussed in Section II). We will indicate first, how the people of South Asia remain

deprived of basic necessities even after forty years of independence, and that the particular mechanism of economic growth in operation in this region may well be increasing poverty rather than reducing it. Second, we will examine comparative data for the countries of South Asia to show a remarkably similar statistical profile of change in economic structure and the emerging financial crisis. Third, we will provide summary evidence of the considerable potential in terms of human, land, energy and mineral resources. Finally, we will indicate recent evidence to show that in many cases this resource potential is being rapidly eroded as the result of ill-conceived development strategies.

### **1. Economic Growth, Financial Crisis and Poverty in South Asia**

The mechanism of economic growth in South Asian countries has been such that while poverty increases, the crisis in economic structure manifests itself increasingly in the form of a financial crisis.<sup>1</sup> This is a form which has more immediate repercussions for the Establishment than the distant image of a people in pain. If we look at Table I we find a remarkably similar profile of change in the key economic indicators in the countries of South Asia. While the percentage of people below the poverty line remains high, the budget deficit increases rapidly, as does the deficit in the balance of payments. For example, in India the budget deficit as a percentage of total government revenue increases from 29.9 per cent in 1976 to 48.9 per cent in 1986; similarly Pakistan's increases from 38.1 per cent to 53.9 per cent, over the same period; Sri Lanka's figure for budget deficit as a percentage of government revenue already very high at 54.3 per cent in 1976 increases further to 55 per cent by 1986.

There is a similar sharp rise in the balance of trade deficits in these countries. For example over the period 1970 to 1984, the trade deficit increased from US\$ 131 million to US\$ 4,102 million in India; in Pakistan from US\$ 538 million to US\$ 3,750 million; in Sri Lanka from US\$ 353 million to US\$ 1,698 million; and in Bangladesh from US\$ 426 million to US\$ 1,690 million.

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<sup>1</sup> For an analysis of the relationship between the economic and the financial crisis see, A Hussain, 'Our Crisis Financial or Real?', Herald, Karachi, August 1989.

The rapidly rising budget and balance of trade deficits have induced such a rapid increase in debt, that the debt servicing burden is becoming intolerably heavy.

Table I, for example, shows that, the ratio of debt service to export earnings from goods and services (debt-service ratio), has increased from 15.7 per cent to 21.4 per cent, over the period 1972 to 1985 in the case of India; in Pakistan from 19 per cent to 32 per cent and in Sri Lanka from 22 per cent to 27.6 per cent. Bangladesh, the only exception has a debt service ratio that remains roughly the same at about 18 per cent.

The level of debt servicing in these countries is so high that a substantial reverse resource flow is beginning to take place. For example, Table 1 shows that debt service as a of gross aid disbursements has increased rapidly in South Asian countries. During the period 1975 to 1985 this ratio has increased from 43.3 per cent to 51.5 per cent in India from 23.4 per cent to 87 per cent in Pakistan; and from 52 per cent to 73.4 per cent in Sri Lanka.

While resources are flowing out, the domestic economic structures are exhibiting increasing capital intensity and a lowering of the weight of commodity producing sectors relative to the services sector. This is indicated in Table I which shows that the capital intensity of manufacturing increased from 41 per cent to 45 per cent in the Indian economy over the period 1975 to 1985; in Pakistan it increased from 24 per cent to 28 per cent over the same period; and from 24 per cent to 35 per cent in the case of Bangladesh. These changes indicate a declining employment generation capability of the manufacturing sector in these economies, for given growth rates of GNP. As the data shows, even at current levels of GNP, intolerably high deficits are being generated. It is unlikely, therefore, that the declining employment elasticity with respect to output in South Asian economies, can be compensated by accelerating growth in GNP in an attempt to increase employment. Given the present structure of South Asian economies there seems to be a tendency for increasing unemployment.

Let us now consider the evidence on diet and health. Table 9 presents data for South Asia, and comparative data for other regions, for malnutrition. Table 9 shows that 50 per cent of

South Asia's population is living below this poverty line, if we use as the criterion of poverty a calorific consumption equal to 90 per cent of the FAO/WHO requirement for an active working life. The criterion for acute poverty is 80 per cent of the FAO/WHO norm. The calorific intake in this definition is not enough to prevent stunted growth and serious health risk. As much as 21 per cent of the population of South Asia falls below even this line of abject poverty. Not only is almost half the population of South Asia suffering from diet deficiency, but it appears that the number of people in this category are increasing over time. Over the period 1970 to 1980, there was a 38 per cent increase in the number of people in South Asia who were unable to consume 90 per cent of the FAO/WHO calorific requirement. The increase in the number of people was even greater in the category of acute poverty, i.e., (80 per cent of the FAO/WHO norm). The increase in the number of people in this category over the period was 47 per cent. In both categories, not only was there an increase in the number of people but an increase in the percentage of the population below the poverty line (the change in the percentage share of population being 0.03 to 0.02 respectively (see Table 9).

The state of health of the majority of the population of South Asia can be judged by the fact that 68 per cent of the population in the region does not have access to safe drinking water. Consequently, large numbers of people are dying of water-borne diseases such as cholera, typhoid, dysentery, etc. In Pakistan for example, 40 per cent of all deaths are due to water-borne diseases. Similarly, infant mortality rates in South Asia are amongst the highest in the world<sup>1</sup>. For the region as a whole the infant mortality rate is 99.2. This is high even when compared to all developing countries where the average is 71, and very high when compared to the industrial economies where the average is 9 (See, Table 8).

In a situation where a large proportion of the population of South Asia is subject to serious health problems, the gross inadequacy of medical facilities intensifies the sufferings of the people. Thus, for example, the population per physician in

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<sup>1</sup> Akmal Hussain, (Introductory essay), 'Is Pakistan's Growth Path Sustainable?', in A Hussain, Strategic Issues in Pakistan's Economic Policy, Progressive Publishers, Lahore, 1988.

South Asia is as high as 10,508. This is almost twice as high as in developing countries as a whole, and about twenty times the figure in the industrial market economies. (See Table 8).

The evidence presented in this section suggests that even after forty years of economic growth in the post-colonial period, the majority of the people of South Asia not only remain deprived of basic necessities, but that poverty, malnutrition, and unemployment are increasing. In contrast to the deprivation of the people, the governments are spending so much on the state apparatus that a financial crisis is emerging. As national indebtedness reaches intolerably high levels, the governments have nothing to show for it to the people except bureaucratic and military establishments.

## **2. Major Features of the Process of Economic Growth in So Asia**

The evidence presented in the preceding section shows that in spite of differences in economic structures and resources, South Asian economies have a remarkably similar profile with respect to the changes that are occurring over time. While levels of poverty continue to remain high the capacity of the economy to deal with it appears to be deteriorating. This is indicated by declining employment elasticity with respect to GNP growth, and rapidly rising budget and balance of payments deficits. This points to the similarity of some of the features of the growth mechanism in operation in South Asian countries. These features will be described in summary form in the present section. At a formal level the development strategies in South Asia have varied both across countries as well as across different periods in their post-independence history.<sup>1</sup> Yet there are certain important characteristics of the growth process which have been common to all South Asian countries. These are:

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<sup>1</sup> For example, India embarked on a strategy of establishing a heavy industrial base within a large public sector, while Pakistan started with an import substitution industrialization focused on consumer goods within a predominantly private enterprise regime. Again, Sri Lanka began with a dualistic plantation based economy, and after 1977 initiated an 'outward-oriented' growth strategy within the framework of IMP/World Bank loan conditionality.

1. The growth process occurred within the framework of highly centralized state structures. This in turn had two implications. First, even where (and in periods when) democracy functioned, the people could not participate in the daily decisions that affected their immediate economic, social and ecological environment. Second, the large bureaucracy and military establishment could claim a dominant share of, government funds.
2. The growth process was based on a highly unequal distribution of productive assets, and therefore induced poverty and inequality in income distribution together with large import expenditures on luxury consumer goods.
3. The government revenue was drawn from a narrow tax base. At the same time the centralized nature of the state structure induced a rapid increase in non-productive expenditure. There was little government revenue left over for poverty alleviation programmes, or the construction of social and economic infrastructures for a rapidly growing population. So high were the administrative and defence expenditures, that the state engaged in both domestic and foreign borrowing to finance non-productive expenditure. In such a situation the budget deficits grew unabated. Soon, the debt servicing on loans incurred to finance these deficits became a major element in the deficit itself. This ushered in the phenomenon of reverse transfer of resources whereby an increasing percentage of gross aid disbursements went into debt servicing.
4. The reverse flow of resources was induced not only by pressures originating on the budgetary side, but also by pressures on the balance of trade. These arose out of the fact that in most of the countries of South Asia the export structure was oriented towards primary commodities whose terms of trade were declining with respect to manufactured imports. Growth of export earnings in South Asia were further restricted by the protracted recession in the post-1973 period, in the advanced industrial countries and the imposition of quota and tariff restrictions on Third World exports to these countries.
5. Since the pattern of demand was based on an unequal income distribution during the growth process, demand

came to be concentrated in relatively expensive goods requiring capital intensive production techniques. Moreover, in a number of countries in South Asia, economic -growth involved using imported technologies. Since these technologies re designed according to factor endowments in the advanced industrial countries, they tend to be relatively capital intensive. Even where efficient technology choices exist, entrepreneurs in South Asia often prefer the more capital-intensive technique because of control over the production process it enables in a situation where labour-management tensions are endemic. At the same time with the onset of the Green Revolution and the problem of ‘bunched’ labour demand at peak seasons, there was a tendency for increasing mechanization even in agriculture which was traditionally expected to bear the brunt of labour absorption.<sup>1</sup>

The tendency of growing automation in both industry and agriculture resulted in declining employment coefficients with respect to output. Thus, while the labour force in South Asia was growing rapidly, employment generation for given growth rates was declining. In such a situation one would expect unemployment to increase over time.

### **3. The Resource Potential of South Asia**

Tables 3 to 8 provide evidence of the human and natural resource potential of South Asia, in comparative perspective. As Table 3 shows, South Asia has 20.1 per cent of all scientists, engineers and technicians who are engaged in research and development in the developing countries of the world.<sup>2</sup> This points to the considerable potential for creating *new* knowledge and of using it for economic and social development. In terms of enrollment in higher education, South Asia has on average,

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<sup>1</sup> For a detailed analysis of the ,pattern of labour demand in the Green Revolution period, and its impact on technology choice, see, Akmal Hussain, ‘Labour Absorption in Agriculture’, ILO/ARTEP Interim Report, 1989. Also, ‘Agrarian Change ‘and the Demand for Form Labour,’ in A Hussain, Strategic Issues in Pakistan’s Economic Policy Progressive Publishers, Lahore 1988.

<sup>2</sup> Estimated from UNESCO, Statistical Year Book 1987, Paris, 1987; UN Demographic Year Book 1985, New York, 1987.

410 persons per 100,000 of the population, compared to 168 per 100,000 in China,<sup>1</sup> even though the quality of higher education in many cases is poorer than in South Korea. (The latter, of course, has a much smaller population base). In terms of the labour force, also, South Asia has a huge potential, having 40.2 per cent of the working age population of all developing countries<sup>2</sup>.

Table 4 presents regional and comparative data for land resources and the potential for cereal production. The considerable cultivable land potential and the degree of its under-utilization can be judged from the following fact: South Asia has 25.4 per cent of the cultivable land resources of all developing countries<sup>3</sup>, but has 23.3 per cent of the total cereal output of all developing countries. The differential between the potential and actual agricultural output is understated when presented in terms of cereal production. This is because of wide differences in cropping patterns across the developing countries. Area specific potential and actual output show a considerably greater differential. For example, the potential agricultural output in the Indus Basin is estimated to be three times the current output.<sup>4</sup>

Table 11 gives the extent of forest resources and the pace of depletion in the region. South Asia as a whole has a forest resource of 64,421 million hectares (closed plus open forests). It also has the largest river and irrigation system in the world. According to conservative estimates made by the UN statistical office, the technical potential for hydroelectric power in South Asia is 124,750 megawatts. That this may be highly underestimated is indicated by the fact that the nine source gives for Pakistan a hydro electric potential of 19,600 MW. On the other hand an alternative source (Professor Kaparov) suggests a potential of 40,000 MW on Pakistan's main rivers alone.<sup>5</sup>

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<sup>1</sup> UNESCO, Statistical Digest, Paris, 1987,

<sup>2</sup> World Bank, World Development Report 1987, op.cit.

<sup>3</sup> FAO, Production Year Book, Vol. 40, Rome, 1987,

<sup>4</sup> Roger Revelle, 'White House Panel', cited in Akmal Hussain, 'Impact of Agricultural Growth and Changes in Agrarian Structure of Pakistan', D Phil Thesis, Sussex, 1980.

<sup>5</sup> Akmal Hussain, 'Is Pakistan's Growth Path Sustainable?', op.cit.

An examination of the mineral wealth of South Asia shows it is rich in some minerals such as mica, iron ore, coal, manganese, natural gas, and graphite. At current levels of production, on a world output basis, India ranks first in mica, sixth in coal, iron, ore and manganese<sup>1</sup>. Pakistan's major mineral product is natural gas with reserves of about 406,000 metric tons, cement, and to a much lesser extent chromites and salt<sup>2</sup>. There have also been recent discoveries of copper but estimates on the size of the deposits are not yet available. In Sri Lanka gemstones and graphite are the principal minerals, with gems accounting, for 5 per cent of all exports. Sri Lanka's graphite in terms of its purity is regarded to be unique in the world. It is many times more valuable on a per ton basis than amorphous graphite found elsewhere.<sup>3</sup>

#### **4. Resource Potential Undermined**

Tables 9 to 12 provide evidence of the extent of erosion of the human and natural resource base of South Asia. In the preceding sub-section we gave a brief description of the human and natural resource base of the South Asian region. It appears that the region is rich in terms of trained manpower, cultivable land and irrigation resources as well as mineral wealth. Yet much of this potential is under-utilized. However what is even more serious for the future is that because of the failure to provide food access, and because of inadequate attention to ecology, health, education, employment the human and natural resource base is being rapidly eroded. For example, because of inadequate diet, infected drinking water and poor health facilities millions of children and adults die every year. A large proportion of the population that manages to survive lives in a state of malnutrition due to inadequate access to food, and is subjected to life long suffering from curable diseases because of water borne diseases. Of those few who manage to survive these hazards and succeed in acquiring an education, face

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<sup>1</sup> 'K P Wang, Far East and South Asia—Mineral Perspectives Bureau of Mines, US Dept. of Interior, Washington DC, 1977.

<sup>2</sup> Ibid

<sup>3</sup> Ibid

unemployment in growing numbers. This is because of declining employment generation capability of the South Asian economies. Thus it can be suggested that the human resource base of South Asia is not merely under-utilized, but is actually being eroded over time.

When we consider the cultivable land resource we discover that due to inadequate attention to drainage and soil conservation, desertification is occurring at a rapid rate. In Pakistan for example 25 per cent of the unirrigated cultivable land has been converted into desert as the result of soil erosion<sup>1</sup>; similarly in India 27 per cent of the national area is affected by erosion which is occurring at the rate of 75 metric tons per hectare per year.<sup>2</sup> When we consider the more valuable irrigated area we discover rapid depletion occurring due to salinization. For example in Pakistan 40 per cent of the irrigated area is already affected by salinization<sup>3</sup>. In India 27 per cent of the irrigated area is affected by salinization, and in Sri Lanka 23 per cent.

The depletion of the existing relatively low forest cover in South Asia gives similar cause for concern. In Pakistan out of a total forest area of 2.5 million hectares, 2,500 hectares, i.e., 0.1 per cent a year are being depleted of trees<sup>4</sup>; India with a total forest resource of 56 million hectares is losing its forest at a faster rate (0.3 per cent per year) with 132,000 hectares per year being deforested; Bangladesh with 0.9 million hectares has a depletion rate of 0.9 per cent per year; Sri Lanka with a forested area of 1.66 million hectares is depleting this resource at the high rate of 3.5 per cent. Nepal with a forest area of 2 million hectares has the highest depletion rate in South Asia, losing 4.1 per cent of its forest every year<sup>5</sup>. These depletion figures are based on data provided by forest departments of the countries concerned and are highly understated. To get an idea of the degree of understatement consider the case of India. The forest department figure of annual deforestation is 152,000

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<sup>1</sup> Akmal Hussain, 'Pakistan: State of the Environment', Go of Pakistan, op-cit

<sup>2</sup> World Resources 1987, A Report by the International Institute for Environment and Development and the World Resources Institute, Basic Books Inc., New York, 1987.

<sup>3</sup> Ibid

<sup>4</sup> This is an underestimation since the figures are based on forest department estimates.

<sup>5</sup> Ibid.

hectares. On the other hand India's Centre for Science and Environment reports that according to satellite data India is losing not 132,000 hectares a year, but as much as 1.3 million hectares annually.<sup>1</sup>

A brief review of the population levels of rivers in South Asia gives an equally bleak picture for this vital resource. Large deposits of fecal coliform have been detected at significant levels in the major rivers of Bangladesh, India and Pakistan. What is even more serious is that in some of these rivers the chemical waste from industry is going beyond the regenerative capacity of the river water. Evidence shows that large sections of some of the major rivers of South Asia have been rendered toxic.<sup>2</sup>

## **II. SUSTAINABLE DEVELOPMENT, GRASS ROOTS INITIATIVES AND REGIONAL COOPERATION**

On the basis of the evidence presented in Section I on the human and natural resource depletion, it can be suggested that the great challenge facing each of the countries of South Asia is to devise a new strategy of sustainable development, i.e., a development process which while improving the material welfare of all the people, protects and preserves at the same time, the natural and human resource base. At the institutional level, such a sustainable development strategy will involve developing and linking together two levels of social organizations: the micro-level grass roots organizations and the macro, or national/regional level.- Let us briefly examine each of these levels.

### **1. Participatory Development at Grass Roots Level**

What is required is a decentralization of administrative economic and political power, through the creation of effective grass roots organizations. This is necessary so that the local community can have control over the decisions that affect their economic,

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<sup>1</sup> India, The State of the Environment, Centre for Science and Environment, 1987.

<sup>2</sup> See, Pakistan: State of the Environment, op.cit.

**Table 1: South Asian Economies Compared**

Country	1			2		3		4		5		6		7		8		9		
	Growth rate of GDP (Percent)			Structure of Production (Percent of GDP Manufacturing Service)		Poverty (% below Poverty Line) <sup>f</sup>		Capital Intensity of Manufacture (% of Value <sup>g</sup> Added)		Balance of Trade Deficit (Million of US\$)		Budget Deficit (as a % of Total Govt. Revenue)		Expenditure on Public Administration (as a % of Total Govt. Expenditure)		Debt Service Ratio (% Export of Goods and Service)		Reverse Flow of Resources <u>Debt Service</u> Gross Disbursement		
	Period <sup>e</sup>	Period <sup>b</sup>	Period <sup>c</sup>	1965	1985 <sup>d</sup>	1965	1985 <sup>c</sup>	1975	1975	1985	1970	1984	1976	1984	1976	1986	1972	1985	1975	1985
India	3.37	-	5.0	15	17	31	41	46	41	45	-131	-4101.8	29.9	48.9	59.9	64.3	15.7 <sup>m</sup>	21.4 <sup>n</sup>	43.3 <sup>n</sup>	51.5 <sup>n</sup>
Pakistan	6.42	4.34	6.66	14	20	40	47	43	24	28	-538	-3750	38.1 <sup>i</sup>	53.9	73.1	58.0	19	32.0	23.4	870
Sri Lanka	5.0	2.9	5.4	17	15	51	46	14	24	23	-353	-1697.6	54.3 <sup>i</sup>	55.0 <sup>k</sup>	40.8	68.8	22	27.6 <sup>l</sup>	52.0 <sup>p</sup>	73.4
Bangladesh	-0.3	4.1	-	5	8	36	36	64	24	35	-426 <sup>h</sup>	-1690	-	-	31	n.a	18	17.0	-	17.0

Notes: 1. <sup>a</sup>India (1975/76 to 1980/81), Pakistan (1960 to 1969), Sri Lanka (1960 to 1970), Bangladesh (1970 to 1975)

<sup>b</sup>Pakistan (1973 to 1977), Sri Lanka (1970 to 1977), Bangladesh (1975 to 1984)

<sup>c</sup>India (1981/82 to 1985/86), Pakistan (1977 to 1988).

2. <sup>d</sup>Manufacturing includes all branches of production activity (food processing, textile and clothing, chemicals, etc and excludes construction, electricity, gas and water.

<sup>e</sup>Services include all forms of trading and commerce.

3. <sup>f</sup>The estimates are calculated from World Bank data for each country using the same poverty line: the income per head accruing to the forty-fifth quartile of the Indian population is Rs. 15 per capita at constant 1960.61 prices, adjusted by the consumer price index for agricultural labourers. This income is estimated to a 2250 calories per person per day, and is defined as the poverty line.
4. <sup>g</sup>The following industries were defined as capital intensive (International Standard Industrial Classification) ISIC 351 (Industrial chemicals), 352 (Other chemicals), 356 (Plastic products), 362 (Glass and glass products), 369 (Other metal non-mineral products), 371 (Iron and steel), 381 (Metal products), 384 (Transport equipment), 385 (Professional and scientific equipment).
5. <sup>h</sup>1972-3
6. <sup>i</sup>1979  
<sup>j</sup>1978  
<sup>k</sup>1985
7. <sup>l</sup>1986
8. <sup>m</sup>For India the debt servicing ratio is based on the debt servicing on all loans (official and commercial).
9. <sup>n</sup>For India's reverse flow calculation, only official flows are considered. Here the debt servicing figure for official loans is taken as is the figure of gross loan disbursements.  
<sup>o</sup>For Pakistan the 1986 figure is used. Gross disbursements are exclusive of aid to Afghan refugees.  
<sup>p</sup>1978.

Source: For South Asian Economies compared:

1. UNCTAD, Handbook of International Trade and Development Statistic New York, UN, 1987, Table 6.2; N L Sirisena. 'Determinants of Economic Growth in Sri Lanka, 1970-86', Sri Lankan Economic Journal Vol. 2, No. 1, 1987.
2. World Bank, World Development Report 1987, New York. Oxford University Press, 1987, Table 3.
3. M S Ahluwalia, N C Caner, and H B Chenery, 'Growth and Poverty in Developing Countries', Journal of Development Economics, Vol. 6. No. 3, 1979. Table 1.
4. UNIDO. Industry and Development Global Report 1987, Vienna, 2087.

5. UNCTAD, Yearbook of International Trade and Development Statistics, New York, UN, Table 5-1; Chr. Michelsen Institute, Bangladesh Country Study and Norwegian Aid Review 1986, Norway, 1986.
6. World Bank, Sri Lanka: Issues in Macro-Economic and Industrial Development Policy. Washington DC. April 20, 1987; World Bank. India: An Industrialization Economy in Transition, Washington DC, May 6, 1987, Vol. 3, Pakistan Economic Survey, 1987-88, Government of Pakistan (Finance Ministry), Islamabad. 1988.
7. World Bank, World Development Report 1987, New York, Oxford University Press, 1987.
8. World Bank, Issues in Macro-Economic and Industrial Development Policy, Washington DC. April 20, 1987, World Bank, India: An Industrializing Country in Transition, Washington DC, May 6, 1987, Vol. 3, World Resources 1987: A Report by International Institute for Environment and Development and the World Resources Institute New York, Basic Books Inc. 1987, Table 15.2.
9. World Bank, Issues in Micro-Economic and Industrial Development Policy, Washington DC, April 20, 1987, World Bank, India: An Industrializing Economy in Transition, Washington DC, May 6, 1987. Vol. 3, Pakistan Economic Survey, 1987-88, Government of Pakistan (Finance Ministry) Islamabad. 1987, Chr. Michelsen Institute, Bangladesh Country Study and Norwegian Aid Review, Norway, 1986. World Bank. Development Report 1987, New York, Oxford University Press, 1987.

**Table 2: Social Indicators for South Asia**

		1				2	3			4			5	6		
		Income Distribution (Percentage share of household income by percentile groups of households)				Poverty (% below line 1975)	Sanitation			Drinking Water			Reported Malaria Cases 1984 total number	No. of Deaths From Selected Vaccine-Preventable diseases Early 1980 (thousands)		
Year	Lowest 20%	Middle 60%	Highest 20%	Highest 10%	Total		Urban	Rural	Total	Urban	Rural	Tetanus		Measles	Whooping Cough	
India	1975-6	7.0	43.6	49.4	33.6	46	8	30	1	55	80	47	2023462	298	782	189
Pakistan	1985-6	6.53	46.80	45.60	30.4	43	20	53	6	40	78	24	76996	132	163	66
Sri Lanka	1980-1	5.8	44.5	49.8	34.7	14	67	80	63	37	76	26	149470	n.a	n.a	n.a
Bangladesh	1981-2	6.6	48.1	45.3	29.5	64	4	21	2	41	29	43	31787	119	173	69

Sources: For social indicator for South Asia.

1. World Bank, World Development 114 1987, New York, Oxford University Press. 1987.
2. Ms. Ahluwalia, N G Carter and H B Chenery, 'Growth and Poverty in Developing Countries Journal of Development Economics, Vol.6, No. 3, 1979.
3. 4 & 5 World Resources 1987: A report by the International Institute for Environment and Development and The World Resources Institute, New York, Basic Books Inc, 1987.
6. UNICEF, The State of the World's ( 1985, UK. Oxford University Press, 1985.

7. World Bank, World Development Report, 1987 New York, Oxford University Press, 1987.
8. UN Statistical Year Book 1983/84, New York, 1986.
9. & 10. World Bank, World Development Report, 1987, New York, Oxford University Press, 1987.
11. & 12. World Bank, World Development Report, 1987, New York, Oxford University Press, 1987
13. World Bank, World Tables (3rd Edition), Vol II, Baltimore, John Hopkins University Press, 1983; World Bank, India; Economic Situation and Development Vol. 11, Washington, 9 May 1966.

**Table 3: Human Resource Potential (South Asia)<sup>a</sup>**

Country	Total Population (all ages)	Scientists, Engineers, Technicians Engaged R&D in Early 1980s	Population in working Age Group (16-64 years) percentage
India	781.4 million (mid 1986) <sup>b</sup>	56527 <sup>c,d,e</sup>	56
Pakistan	99.2 million (mid 1986) <sup>b</sup>	11620 <sup>f</sup>	53
Sri Lanka	16.1 million (mid 1986) <sup>b</sup>	10997(1977) <sup>g,h</sup>	62
South Asia as % of the developing countries	28.0%	20.1%	
South Asia as % of World	21.8%	2.24%	

Notes: <sup>a</sup>India, Pakistan, Sri Lanka, Nepal and Bangladesh.

<sup>b</sup>Figures obtained from World Do R4 1988. Table I, Basic Indicators.

<sup>c</sup>Including auxiliary personnel

<sup>d</sup>Including technicians.

<sup>e</sup>Not including data for higher education sector.

<sup>f</sup>Data relate to R&D activities concentrated mainly in Government financed research establishments- Social sciences and humanities in the higher education and general services sectors are excluded.

<sup>g</sup>Data relate to numbers economically active.

<sup>h</sup>For 1972.

**Table 4: Land Resources in South Asia, 1985**

	Cultivable <sup>b</sup> Land	Cereal Production <sup>c</sup> (Percent)
South Asia	57.5	51.1
Asia <sup>d</sup>		
South Asia	25.4	23.3
Developing countries		
South Asia World	13.8	11.7
Developing Countries		
World	54.2	50.2
Actual Cereal Output In South Asia (Thousand of Metric tons)	215,792	
Potential output of cereals in South Asia <sup>e</sup> (Thousand of Metric tons)	1,147,972	

Notes: <sup>a</sup>India, Pakistan, Sri Lanka, Nepal and Bangladesh.

<sup>b</sup>Arable land and land under permanent crops.

<sup>c</sup>Wheat, rice, puddy coarse grains, maize, barley.

<sup>d</sup>Excludes China but includes Japan.

<sup>e</sup>Estimated by taking the yield per hectare of South Korea (5662 Kg/hectare) and multiplying by the total cultivable land in South Asia (20,31,90 thousand hectares).

Source: FAO Production Year Book Vol. 40. Rome 1987, Tables I and 15.

Country	(1)			(2)			Crude Oil Million M/Tons Proved Recoverable Reserve (1981)	Natural Gas Billion Cubic Meters Proved Recoverable Reserves (1983)	Uranium Metric tons			
	Year of Data	Bituminous Coal Million Metric Tons	Proved Reserves in Place	Prove Recoverable Reserves	Estimated Additional Resources	Year of Data			Proved Reserves in Place	Prove Recoverable Reserves	Estimated Additional Resources	Reasonably Assured Resources (1983)
India	1981	26331	*	85547	1981	1581	1581	1943	471	420	32000	900
Pakistan		*	*	*	1979	145	102	310	13	450	*	*
Bangladesh	1981	1054	*	*	*	*	*	*	*	192	*	*
Sri Lanka	*	*	*	*	*	*	*	*	*	*	*	*

Note: \* Not available.  
Source: UN Statistical Office.

**Table 6: Estimated Principal Potential Renewable Energy Resources  
(tons of Coal Equivalent)**

	1		2		3		4	
	Hydroelectric Power		Geothermal Electric Potential		Wood from Forest Plantations		Total	
	Total 10 <sup>a</sup> Tons	Per Caput Tons/Year*	Total 10 <sup>a</sup> Tons	Per Caput Tons/Year*	Total 10 <sup>a</sup> Tons	Per Caput Tons/Year*	Total 10 <sup>a</sup> Tons	Per Caput Tons/Year*
Africa	0.19	0.4	0.08	0.2	2.48	5.4	2.77	6.1
Asia	0.33	0.1	0.20	0.1	1.88	0.75	2.41	0.96
China, Vietnam, N. Korea	(0.19)	0.2	(0.10)**	0.1	(0.56)	0.55	(0.85)	0.84
South & East Asia	(0.14)	0.1	(0.10)**	0.1	(1.32)	0.9	(1.56)	1.05
North America	0.19	0.5	0.21	0.6	2.44	6.7	2.84	7.8
South America	0.23	1.0	0.23	1.0	3.12	13.0	3.58	15.0
Europe	0.09	0.2	0.015	0.03	0.52	1.1	0.625	1.3
USSR	0.13	0.5	0.065	0.25	3.12	11.8	3.315	12.6
Oceania	0.025	1.1	0.18	8.2	0.52	23.6	0.725	33.0
World Total	1.19	0.26	0.98	0.22	14.08	3.1	16.25	3.61
LDC Total	0.80	0.25	0.51	0.16	7.48	2.33	8.79	2.74

**Table 7: Energy Resources in South Asia, 1983**

	Primary <sup>b</sup> Energy Production (Percent)	Electricity Installed <sup>c</sup> Capacity <sup>c</sup> (Percent)
South Asia Developing Countries <sup>f</sup>	7.6	16.4
South Asia <sup>a</sup> World	2.0	2.2

**Table 8: South Asian Human Resource Erosion in 1980s**

	Infant Mortality Rate (age under 1) 1985	Population per Physician 1981	Population per Hospital Bed 1981-2	Daily Calorie Supply per Capita 1985	Illiterate Population 15 Years & over, various years (% of total population)			Public Expenditure on Education as % of Budget 1984	% of Total Population without Access to Safe Water Supply (late 1970s)
					Total	Male	Female		
India	89	3700	634	2189	65.9	52.3	80.6 (1971)	3.7	83.0
Pakistan	115	2910	1737	2159	73.8	64.0	84.8 (1981)	2.0	71.0
Sri Lanka	36	7460	350	2385	13.9	9.2	18.8 (1981)	2.8	80.0
Bangladesh	123	9700	4545	1899	74.2	62.7	86.8 (1974)	1.8	55.0
Nepal	133	28770	5271	2034	80.8	66.6	95.0 (1975)	1.8	98.0
South Asia	99.2	10508	2507.4	2133.2	61.7	51.0	73.2 (Mid 1970s)	-	68.5
Developing Economies	71	5560	n.a.	2470	n.a.	n.a.	n.a.	-	57.70
Industrial Market Economies	9	530	n.a.	3417	n.a.	n.a.	n.a.	-	n.a.

**Sources:** World Bank, World Development Report, 1987, Washington D.C, 1987, Tables 29, 30 and 32.  
World Bank, World Bank Tables, Washington, 1980, Series IV-Table 3, UN Statistical year Book, 1983/84, New York, 1986 Table, 53, 59 and UNESCO Statistical Digest, Paris, 1987.

**Table 9: Malnutrition in 1980**

	Not enough calories for an active working life (below 90 percent of FAO/WHO requirement)		Not enough calories to prevent stunted growth and serious health risk (below 80 percent of FAO/WHO requirement)		
	Percent Share of Population (1980)	Change in Percent Share of Population (1970to 80)	Percent Share of Population (1980)	Change in Percent Share of Population (1970to 80)	Total Population (million) (1980)
South Asia	50	+0.03	21	+0.02	470
Latin America & Caribbean	13	-0.07	6	-0.04	50
All developing countries	34	-0.06	16	-0.02	730

Source: World Bank Estimates.

**Table 10: Erosion of Land Resources in 1980s**

Extent of Desertification	Percentage of Irrigated Area under Salinization	Percentage of National Area affected by Soil Erosion	Rate of Soil Erosion (Metric Tons by Hectares per year)
Pakistan	40	-	-
India	27	27	75
Sri Lanka	13	-	-

Source: World Resources Institute & International Institute for Environment & Development.

**Table 11: Forest Resources and their Depletion**

Country	Extent of forest and wood land 1980 (Thousand hectares)		Deforestation of closed forests, 1981-5 Av. annual extent.		Reforestation 1980s (thousand hectares per year)
	Open	Closed	(thousand hectares per year)	(percent per year)	
India	5393	51841	132	0.3	138
Pakistan	295	2185	1	0.1	7
Bangladesh	0	927	8	0.9	17
Sri Lanka	x	1659	58	3.5	13

Sources: UN Food and Agriculture Organization, UN Economic Commission for Europe, UN Environment Programme, and country data sources.

## 12: Toxicity of River Water/River Water Quality

Country	River	Fecal Coliform (Number/100 milliliters) Number of Samples Mean,
Bangladesh	Brahmaputra	2606
	Lower Ganges	1963
	Meghna	3193
India	Bhima	175
	Cauveri	439
	Chaliyar	438
	Godavari	7
	Kallada	578
	Krishna	57
	Mahi	550000
	Narmada	260000
	Periyar	767
	Sabarmati	1147
	Subarnarekha	21455
Pakistan	Tapti	37000
	Wainganga	3699
	Indus	120

**Note:** ‘Samples, outside detection limits were assigned the detection limit value for calculating the mean.

Source: Global environmental monitoring system. (World Resources1987)

social and natural environment. Sustainable development and effective democracy means organizing the local community to participate in the multi-functional tasks of formulating and implementing such projects as income generation, health, drinking water, education, soil preservation, water management and forestry.

It is only an integrated and participatory approach at the local level that can create a new relationship between man, nature and growth for sustainable development. Such an approach would make people the subject as well as the object of development, and in so doing would unleash their tremendous creative potential. This potential is rooted in the shared historical experience of balancing their own needs and forms of production with the imperatives of preserving the natural environment. The valuational framework within which participatory community effort can occur is based in living folk culture where the self is experienced as fundamentally related with all living beings and with nature. This experience of the self in the present market culture of greed and exploitation has been banished to the margins of popular consciousness. It only finds resonance in art and poetry. Yet the universal values of tolerance, humanity, and harmony with nature, which are inherent in folk culture, can be redeployed to constitute the valuational underpinning of a new social effort at the grass roots level.

The approach of participatory development through grass roots organization that I have suggested is not just in the realm of theory but has already been attempted in a wide range of cases in South Asia: from the Comilla experiment in East Bengal during the 1950s, the German Bank in Bangladesh, to the *Bhoomi Sena* in India and the Aga Khan Rural Support Programme in Gilgit and Skardu of northern Pakistan. Experiments in urban community organizations have also been successful in a number of cases, such as the Orangi Project in Karachi, Pakistan, or the Working Women's Forum in Tamil Nadu, India. One of the more interesting examples of a linkage between social values forms of production and the environment is provided by the Bishnoi Community in Rajasthan. As Michael Tobias writing in the *New Scientist* shows, the spiritual identity of the Bishnoi is 'linked to the land and its capacity to support them... they are an important model of ecological prudence that much of the world can learn from,'<sup>1</sup> (See, Part N of this book for case studies of such experiments).

What these attempts at participatory development by local community organizations indicate is that the micro-level institutional baths of sustainable development is a very real possibility in South Asia today.

## **2. Regional Cooperation for Sustainable Development**

The micro-level grass roots effort if it is to achieve sufficient geographic coverage, must be combined with macro-level initiatives at the national and regional levels to arrest the processes of ecological damage and to preserve and develop the human resource potential of South Asia.

### **a) National Resource Preservation**

A number of countries in South Asia share common rivers, in some cases common watershed areas and also mountain ranges. Consequently deforestation of watershed areas in one country can lead to flash floods and soil erosion in the downstream country. Similarly throwing untreated industrial waste into the river upstream can cause toxicity and the consequent elimination of fish species and mangrove forests downstream for another country. Again, major wind currents cross in a West-East direction during winter across the international boundary between Pakistan and India, while in summer the Monsoon winds move in the opposite direction from India to Pakistan. Accordingly, the location of thermal plants with untreated sulphur exhaust in one country would pollute and render unhealthy the air in the neighboring country. These examples suggest the need for regional cooperation to counteract the large-scale processes of ecological damage that are in operation in South Asia. (See, part I of this paper). Some of the areas in which Regional Cooperation could occur for the protection and preservation of the environment are:

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<sup>1</sup> Michael Tobias, 'Desert Survival by the Book', *New Scientist*, December 1988.

- i. Joint effort at re-forestation of watersheds, and the treatment of industrial and urban effluent wastes could help reduce soil erosion, devastating flash floods and toxicity of rivers.
- ii. Sharing of bio-saline research and technical knowhow on controlling desertification of soils, (e.g. use of Halogenic Pharadophytes for controlling salinity); technical knowledge on the use of ecologically safe industrial technologies.
- iii. Sharing of information on the flow of waters of rivers, especially flood forecasting.
- iv. Engaging in joint projects for the development of Himalayan resources, and prevention of deforestation and soil erosion on the mountain slopes.
- v. Sharing of information generated at the grass roots level on traditional knowledge systems for sustainable interaction with nature.
- vi. Sharing knowhow on earthquakes, and their forecasting.

#### **b) Human Resource Development**

As discussed earlier in this paper inspite of the impressive growth of GNP over the last forty years in South Asian countries a large proportion of the people live in a state of poverty. There is a high frequency of disease and death due to the deprivation of basic necessities. Unhygienic drinking water and inadequate diet result in stunted physical growth of large numbers of South Asian children. Lack of access to education prevent even larger numbers from fulfilling their intellectual and creative potential.

It is time now to launch a major collective effort at a human resource development programme in South Asia. In order to take practical measures for the fulfillment of this great endeavour a Working Group could be established to begin work on the ways and means of formulating and implementing such a project. The Working Group could be composed of some of the finest talent available in South Asia in the fields of health, engineering and economics. For delivery mechanisms it could examine the prospects of developing and/or supporting grass roots organizations in South Asia and establishing apex organizations to provide quick support whenever bottlenecks occur at the micro-level.

Perhaps regional efforts for Human Resource Development could be focused tin providing clean drinking water, preventive medical facilities, housing, education and productive employment close to the home. The financing of such a project could be done by establishing a Regional Support Fund.