

**ACDIS**  
*Occasional  
Paper*

**Welfare Economics and Growing Inequalities  
in South Asia**

*A.C. Shukla*

Biopollution Study Centre, Christ Church College  
Chhatrapati Shahu Ji Maharaj University  
Kanpur, India

Research of the Program in Arms Control,  
Disarmament, and International Security  
University of Illinois at Urbana–Champaign  
April 2003

This publication is supported by funding from the University of Illinois and is produced by the Program in Arms Control, Disarmament, and International Security at the University of Illinois at Urbana-Champaign.

The University of Illinois is an equal opportunity/affirmative action institution.

ACDIS Publication Series: ACDIS *Swords and Ploughshares* is the quarterly bulletin of ACDIS and publishes scholarly articles for a general audience. The ACDIS *Occasional Paper* series is the principal publication to circulate the research and analytical results of faculty and students associated with ACDIS. The ACDIS *Research Reports* series publishes the results of grant and contract research. Publications of ACDIS are available upon request. For a additional information consult the ACDIS home page on the World Wide Web at <<http://www.acdis.uiuc.edu/>>.

Published 2003 by ACDIS//ACDIS SHU:1.2003  
University of Illinois at Urbana-Champaign  
359 Armory Building, 505 E. Armory Ave.  
Champaign, IL 61820-6237

# **Welfare Economics and Growing Inequalities in South Asia**

---

A.C. Shukla

Biopollution Study Centre, Christ Church College  
Chhatrapati Shahu Ji Maharaj University  
Kanpur, India

Program in Arms Control, Disarmament, and International Security  
University of Illinois, Urbana-Champaign  
April 2003



## CONTENTS

---

<b>About the Author</b>	<b>v</b>
<b>Acknowledgements</b>	<b>vii</b>
<b>Introduction</b>	<b>1</b>
<b>Part One</b>	
<b>New Economic Order</b>	<b>3</b>
Economic Efficiency	3
The Environmental Paradigm	3
<b>Part Two</b>	
<b>Growing Inequalities</b>	<b>5</b>
<b>Part Three</b>	
<b>Pareto Optimality</b>	<b>7</b>
The Implications of Pareto Optimality for an Economic System	7
Norms of Efficiency for Welfare Economics	7
<b>Appendix</b>	<b>11</b>
<b>Bibliography</b>	<b>19</b>



#### ABOUT THE AUTHOR

---

Dr. A.C. Shukla heads the Biopollution Study Centre at Christ Church College, Chhatrapati Shahu Ji Maharaj University in Kanpur, India. He specializes in environmental sciences and policy planning. Shukla is a Member and Chartered Biologist of the Institute of Biology in London, and a Senior Visiting Fellow of the University of New England, Australia. He has completed a major project of the Ganga Action Plan for the Ministry of Environment and Forests of the Government of India, and is associated with a Ford Foundation-funded project of the Regional Center for Strategic Studies in Colombo, Sri Lanka, working on the India chapter of *Environment and Security in South Asia*. Shukla is credited with over 250 research publications in journals like *Nature*, *Hydrobiologia*, and *Revue Algologique*, and several original and edited books. He has traveled widely in connection with participating, chairing sessions and acting as discussant at international conferences. His area of current research interest is environmental security, waters and politico-economy. The work on this *Occasional Paper* was completed when Shukla was a Visiting Scholar at the Program in Arms Control, Disarmament, and International Security at the University of Illinois at Urbana-Champaign.





## ACKNOWLEDGEMENTS

---

The author wishes to place on record grateful acknowledgements to the Program in Arms Control, Disarmament, and International Security at the University of Illinois at Urbana-Champaign, for providing the facilities necessary for this research; and to Professor Clifford E. Singer for inviting him to come to ACDIS as a Visiting Scholar and thereby enabling him to accomplish this endeavor.



## INTRODUCTION

---

The contemporary world faces the challenge of developing a new approach to growth. The real alternatives lie in either “no growth” or “neo growth,” and in this endeavor environmental assets and distributive monetary regimes are of paramount importance. A sound environmental base is supportive of liberalization en route to economic reforms. The critiques of resultant liberalization are still not clear, despite projections of its strengths and caveats of its effects. Simultaneously, the world is slowly sliding from an “economic” to an “environmental” order. Herein lies the promise for the future of resource-rich South Asia. A shift in economic policy and adoption of welfare economics is the burgeoning reality of economic change. How globalization could best build domestic and regional regimes emblemizes the future of South Asia. The golden underpinning dictum is the equitable distribution of monetary dividends to resource owners and manufacturers to curb and control inequality. Despite the fact that international participatory policy perforce touches the forefront of economic emancipation, economic disparity has been growing in South Asia. Determining how best to fit resource mobilization, utilization, and distributive monetary regimes into welfare economics is vital. Current trends in the face of economic inequalities in South Asia call for exploration and analysis to uproot inequalities in South Asia and develop civil societies.

In a bid to seek answers that might provide a resurgence of the welfare of South Asian communities in the face of compulsory globalization and ensuing environmental change, a fresh look at the basic problems and possible future actions is exceedingly important for concerted policy planning. The canvas of subject matter is vast, and hence will be synoptically discussed and analyzed for the sake of brevity.



## PART ONE

---

### New Economic Order

Welfare economics strives to examine social welfare. This examination is achieved on the basis of certain theories and models. Theories, laws, and principles are more or less interchangeably used. There exists literature on the welfare of economics seemingly portraying monitoring parameters suited for nation-states of the North and, to some extent, the South. The majority of models deal within a given set of conditions of political ideologies, systems, resource bases, and environmental assets. But the world is in rapid transition. The global “economic order” is slowly sliding into an “environmental order.” Environmental paradigms reign supreme in the contemporary world, and global environmental change in many ways is perceptibly coupled with globalization. In this changed scenario, the usual welfare models need upgrading to incorporate the “deepening” impacts of the mix of “globalization” and environmental paradigms on the economic welfare of South Asia. When we refer to “economy,” we imply a system with an order to it, but order is difficult to discern in a system in transition—that is, a system in the process of structural change in the face of global, fast-moving dynamics of climate change and, consequently, economies.

#### **Economic Efficiency**

Perhaps welfare accrues reliance on “economic efficiency” or “allocative efficiency” in catering to such goals like employment and maximally efficient utilization of resources (both human and material), used and exploited under the umbrella of science and technology. But unfortunately, human and material resources are unevenly distributed on earth. This is the underpinning cause of inequality inherent in society. No amount of socialism or communism could uproot inequality, let alone succeed in the development of a classless society. South Asia is a mixed bag of economic and social stratification. Economic efficiency calls for the best use of scarce resources, sharing, and income distribution. Equity is both a philosophical concept and economic goal. But no distributive pattern of income could be said to be fair or bad. South Asia has an explicit “mixed economy,” wherein states decide questions such as what products to produce, and for whom to produce them, in order to market them freely under the control of government authorities. But the compulsions of globalization have ushered in liberalization, marked privatization, and the emergence of private enterprise characterized by private ownership. This is a step towards the development of capitalism. Such an abrupt change has stressed South Asian nations, and they are forced into structural changes and regimes—not by choice, but by compulsion. The political ideology and human attunement to this change has been lacking, and therefore, the process of globalization and open market economy is suspect and debated in many quarters.

#### **The Environmental Paradigm**

A sound environmental resource base is supportive of globalization, but some of the states striving to acquire “high-tech” and “bio-tech” standards in an unequal world may go along a disastrous path, the way of South American nations that have encountered bankruptcy and economic failure. However, nations developing indigenous technologies with sound resource bases may come out triumphant in the race. The process is sure to breed greater inequality in South Asia.

If global operations could be superimposed in this circular flow, South Asia stands apart from North Asia in terms of raw resources and finished goods; low-tech and high-tech; and poverty and affluence. The South remains the epitome of environmental and human resources and large markets for consumption of finished products, while the North is the base of industrial finished goods, technology, and industry. In a naturally liberalized world, the North and South would share, distribute, use, and thrive as an underpinning dictum. But exploitative regimes, sanctions, and “neo-colonization” make the function murky and distort natural cooperation into fragments of exploitation, use, and abuse. South Asia has inherited a fair share of mistrust, suspicion, hatred, and disputes over land and other issues, opening floodgates of non-cooperation, militancy, and

misutilization of its resources. All of these factors together prove counterproductive to globalization and economic integration, and force the region into growing inequality.

Welfare economics calls for equity of dividends among the resource owners of the South and the producers of the finished products of the North. However, the process of privatization offsets the fruits of globalization. Global trade and economic regimes are such that they perpetually promote the rich growing richer and the poor growing poorer. This situation is emerging in South Asia as a reality.

Externalities play a vital role in economic welfare. External benefits or costs for which no compensation is made are called spillovers. The developed North has to accept the principle of “the polluter must pay,” and must help in the resurgence of South Asia economically into a vibrant and secure region—a prospect certainly not contradictory to the interests of the North. This spirit of cooperation is also true for South Asian nations, which must come to terms with global compulsions and resort to shared resources and technology. Alas! It could have been translated into reality, but the practice is simply opposed to the preaching.

## PART TWO

### Growing Inequalities

The report on Human Development in South Asia in 1999 sponsored by the United Nations (UN) Development Program portrays a grim scenario of poverty and inequalities in the region. The human development policy results are far from satisfactory, and inequalities are growing beyond comprehension vis-à-vis individuals and among nations. South Asia, home to 23 percent of the world's poorest people, is the epitome of poverty. Approximately 540 million people constituting 45 percent of the regional population earn less than a dollar per day and live below the poverty line. India abounds with poor people with a 53 percent poverty rate, according to the UN Poverty Index. Nepal likewise has a poverty rate of 53 percent, while the rates in other South Asian countries are: Bangladesh, 29 percent; Pakistan, 12 percent; and Sri Lanka, 4 percent. However, according to the poverty indexes published by the countries themselves, the rates of poverty for Bangladesh, Pakistan, Sri Lanka, Nepal, and India are 48, 54, 22, 53, and 50 percent respectively. In accordance with this report, income disparities are largest in South Asia.<sup>1</sup> The concentration of power and wealth is among the richest people. Forty percent of the total income of the region is confined to 20 percent of the population, while the poorest 20 percent shares only 10 percent of the total income. The Gross Domestic Product (GDP) rise per capita between 1960-65 shows that the average income of the richest 10 percent is six times that of the poorest 10 percent. Nepal marks the highest degree of inequality, with the income of the richest 10 percent being ten times that of the poorest 10 percent. This last ratio in Pakistan, India, Sri Lanka, and Bangladesh is 7, 6 and 5 respectively.

The average life expectancy is less than forty years among the 200 million poorest people as a consequence of worsening health conditions. However, for the region as a whole, the average life expectancy is sixty-two years. About 679 million people are deprived of proper sanitary facilities, out of which 661 million in India, 88 million in Pakistan, 91 million in Bangladesh, 18 million in Nepal and 6 million in Sri Lanka have no access to proper sanitation. A safe drinking water facility is denied to 279 million people in South Asia, including 179 million in India, 56 million in Pakistan, 25 million in Bangladesh, 1 million in Nepal, and 7.7 million in Sri Lanka. These figures present a shocking scenario of the drinking water. Proper health facilities are not available to 22 percent of the total South Asian population. Fifty percent of people in Bangladesh, 45 percent in Pakistan, 15 percent in India, and 7 percent in Sri Lanka suffer from lack of health services. Countries other than Bhutan and Maldives spend less than 2 percent of their Gross National Product (GNP) on public health. India spends 0.7 percent, Pakistan 0.8 percent, Bangladesh 1.2 percent, Nepal 1.2 percent, and Sri Lanka 1.4 percent of their GNP on public health. The childbirth mortality rate is 480 per 100,000 live births in South Asia, and the country specific data shows Bhutan at 1600, Nepal at 15,000, Bangladesh at 800, and India at 437. Many of the children who survive birth do not live beyond infancy. Such mortality rates are a result of poor health conditions and shortages of medical facilities. The ratio of doctors per 100,000 people in India is 48, Pakistan 53, Bangladesh 18, Nepal 5, Sri Lanka 23, Bhutan 20, and Maldives 19. In contrast, the number of policemen is one for every 939 people—four times more than the ratio of nurses and doctors to the general population.

Illiteracy and social backwardness loom large in South Asia, which has 395 million illiterate adults. The illiteracy rates are 72, 48, 10, 7 and 62 percent for Nepal, India, Sri Lanka, Maldives, and Pakistan and Bangladesh respectively. Only 3.2 percent of the GNP is spent on education, spread over 2.1, 2.3, 2.9, 3.1 and 3.5 in Pakistan, Bangladesh, Nepal, Sri Lanka, and India respectively. This data of inequality is reflective of levels among the nations of South Asia, but within states the levels of individual inequalities are vastly growing. It becomes evident that South Asian countries are not making investments in the social sector. Moreover, whenever conditions require curtailments in budgets, expenditures on education tend to follow downward trends.

---

<sup>1</sup> See Mahbub ul Haq Human Development Centre, *Human Development in South Asia 1999: The Crisis of Governance* (Oxford: Oxford University Press, 1999). See also Stuart S. Nagel, *Promoting Prosperity: Via Economic and Technological Policy* (Lanham, Md.: Lexington Books, c2000).

Recent data for the years 1990, 1997, and 1998 for South Asia and its nation states—Sri Lanka, India, Maldives, Nepal, Bangladesh and Pakistan—also reveal severe inequalities among people, environment, and economy.<sup>2</sup> This data is given as Tables 1, 2a, 2b, and 2c in the Appendix.

---

<sup>2</sup> See The World Bank, *The Little Data Book* (Washington, D.C.: The World Bank, 2000).



## PART THREE

### Pareto Optimality

---

The concept of welfare cannot be precisely defined, and therefore it is impossible to measure. As a result, we cannot assert objectively that any particular economic situation represents greater or lesser welfare for society than another. One of the main reasons for this difficulty is that we cannot satisfactorily make interpersonal comparisons of utility. That is, welfare in the eyes of one person cannot be compared to the same idea in the eyes of another.

#### **The Implications of Pareto Optimality for an Economic System**

What are the implications of Pareto Optimality for an economic system? The answer can be stated in the form of a proposition. When a perfectly competitive economy achieves a general equilibrium of prices and quantities, no economic entity (individual, household, or firm) achieves a general equilibrium of prices and quantities. In other words, no economic entity can be made better off without some other entity being made worse off. The system has, therefore, attained a Pareto optimal status, and has achieved economically efficient allocation of resources. The individual cases in unison reflect national projections.

The proof of this proposition requires considerably more advanced economic theory. For example, suppose that a perfectly competitive economy has settled down in general equilibrium, keeping in mind the conditions that are “given”—the pattern of consumer preferences, the stock of productive factors, and the state of technology. What are the main characteristics of the resulting state of balance? Should we conclude from this that perfect competition leads to the best of all possible worlds? However, there are some qualifications such as social costs and social benefits, income distribution, and equity.

#### **Norms of Efficiency for Welfare Economics**

The role played by modern welfare economics could well be appreciated in contemporary times. In broad terms, welfare economics deals with the normative aspects of macroeconomics. Welfare economics is concerned not with what the perfect world would look like, but with the changes that may be undertaken to improve the well being of consumers and producers of today’s world. Welfare economics does this by providing us with a norm or standard expressed in terms of economic efficiency. This enables us to state unambiguously whether one equilibrium position is better or worse than another.

In this regards, general principles underlying a social costs-benefit analysis, and the application of those principles to project appraisal and policy evaluation in developing countries, appear to be of importance. Social cost-benefit analysis is concerned with the evaluation of policies, programs, or projects by governments or public sector agencies. The general procedure for such an analysis is to consider the costs and benefits of a given policy measure—for instance, a tariff reform, a fertilizer subsidy for farmers, the construction of a cement factory or a rural health clinic—and to compare the benefits with the costs. The difficulty of evaluating social costs and benefits will vary with the project: the social value could simply be the real value of the physical inputs and outputs of a processed manufacturing plant; or the costs and benefits may be intangible ones, such as the environmental costs of pollution, or the benefits from improved health services. Whatever the problem of evaluation, the underlying principle is the same in all contexts: if the benefits exceed the costs, then the project is deemed socially worthwhile.

As a general statement of principle, the view that the benefits from public sector intervention should exceed the costs would appear to be self-evident. Close examination, however, reveals that a formal cost-benefit analysis involves making value judgments that are not necessarily un-controversial. Consider for example, the cost-benefits of the policy prescription program—familiar to any country undertaking one of the structural adjustment programs advocated by the World Bank—that governments should reduce tariff rates. Consumers will find that they can buy imported goods more cheaply than before; this is likely to be the chief benefit

following from a tariff reform. However, it is not only consumers who will be affected by a reduction in the tariff level. Producers in some industries will face a reduction in profits, and marginal firms may go out of business—causing a loss of jobs for workers. The government will suffer a drop in revenue, and desirable public sector expenditure on projects such as improved primary schools or provision of clean water supplies may have to be curtailed. The cost-benefit analyst is faced with the task of deciding which of all the many possible consequences of the new policy should be included in the evaluation, and then an even more problematic matter is deciding what criteria, or what weights should be used to add together the gains and losses of different groups in society, in order to reach an overall view about the desirability of tariff reform.

It will be clear that cost-benefit analysis involves making normative judgments. In other words, the problem is not just to predict the outcome of different policies, but to say whether or not they are desirable from the point of view of society as a whole. It is not possible to do this without reference to an underlying theoretical framework that provides criteria for identifying the social and economic objectives of society as a whole, which shows how the gains and losses of individual households relate to these overall objectives. Methods of constructing such a framework constitute the subject matter of welfare economics, and some knowledge of welfare economics is an essential prerequisite for the cost-benefit analysis.

Welfare economics is one of the most interesting areas of economic theory, but it is one that raises exceptionally difficult problems, at both the conceptual and practical level. What is “welfare,” and how can we measure it? A new economic policy will typically affect the incomes of many individuals and the prices they face. How do these changes in prices and incomes translate into changes in welfare? Is it a relevant consideration that some households affected by public sector intervention are wealthy, while others are poor?

While the structural changes in South Asia are taking place to cope with globalization, parameters for monitoring success after the process have to be recognized. Regimes have to be built which permeate and strengthen interdependence and cooperation for sustained benefits.

The climate change and periodical natural onslaughts in South Asia cripple the agrarian economies. Fast communication and rapid transportation have to be developed for effective utilization of raw perishable resources. Vegetable and fruit production in India has multiplied, but the problems of potato-rot in the absence of proper storage facilities and transport of vegetables to far-flung markets curb their utilization, and many individuals have to bear hunger and malnutrition. These problems are not unique to South Asia: even in the United States, the production of apples or wheat is dumped into the ocean for economic pricing reasons, instead of feeding humanity. What has to be achieved is sharing and proper distribution. Distributive justice has to be laid in South Asia in particular and the world in general. While the world has recognized and acquired an interest in certain South Asian states, nevertheless preferential status to meet vested interests in search of markets for finished goods or exploitation of raw resources is increasing the gulf of inequality in the region.

When does an economic policy lead to welfare improvement? This difficult question underlies the whole of welfare economics. Pareto Optimality conditions and the concept of a Pareto improvement provide guidance on questions of resource allocation. They do not, however, enable us to reach any welfare conclusions about policies that lead to gains for some and losses for others. Compensation procedures based on the work of noted economists John Hicks and Nicholas Kaldor can be shown to be theoretically unsatisfactory. The student of cost-benefit analysis should be aware that all policy evaluations imply the use of distribution weights. The rule of thumb that says a policy is desirable if the (monetary) benefits exceed the cost implicitly uses a unitary weight system. Yet, all distributive weights imply a value judgment that may be difficult to justify. Distribution questions are theoretically resolved by the use of a social welfare function, but this solution creates its own problems: problems of establishing the nature of such a function and its associated weights for different households; and, if weights other than unity are used, problems will be generated by the potential tradeoff between equity and efficiency.

Conclusively, South Asia has comparable experience with that of the North, in terms of how they industrialized and became economic giants. But the contrasting conditions between the North and South perforce caution that the path to prosperity taken by the North has to be refashioned in the case of the South, catering to the need for stalling environmental degradation en route to industrialization. Problems of poverty, population, lifestyles, and cultures further complicate aspects of social inequity in South Asia. The economic stratification in the region is linked to ethnic, religious, and caste considerations. Thus, in many ways the

situation in South Asia is remarkably different from the North. The creation of a classless society and diminishing of inequality are still facing the vast humanity of the region.



APPENDIX

---

**Table 1: Development Indicators for the Region of South Asia**

	SOUTH ASIA
Population (millions)	1,305
Surface area (1,000 sq. km)	5,140
GNP (\$ millions)	560,059
Population growth (%)	1.9
Population per sq. km	273
GNP per capita (\$)	430

People	1990	1997	1998
Life expectancy (years)	59	62	62
Fertility rate (births per woman)	4	4	3
Infant mortality rate (per 1,000 live births)	87	77	75
Under 5 mortality rate (per 1,000 children)	121	100	89
Child malnutrition (% of children under 5)		53	
Urban population (% of total)	25	27	28
Rural population density (per sq. km of arable land)	472	531	
Illiteracy—males (% of people 15 and above)	41	36	35
Illiteracy—females (% of people 15 and above)	66	60	59
Net primary enrollment (% of relevant age group)	74	77	
Net secondary enrollment (% of relevant age group)	52	55	
Girls in primary school (% of enrollment)	43	43	
Girls in secondary school (% of enrollment)			
Environment	1990	1997	1998
Forests (thousands of sq. km)	750	744	
Deforestation (% change 1990-1995)		0.2	
Water use (% of total resources)			
CO <sub>2</sub> emissions (metric tons per capita)	0.7	0.9	
Access to sanitation (% of urban population)		46	
Access to safe water (% of urban population)	78	83	

Energy use per capita (kg of oil equivalent)	394	443	
Electricity use per capita (kWh)	228	324	
<b>Economy</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>
GDP (\$ millions)	410,341	553,211	565,131
GDP growth (annual %)	5.6	4.6	5.6
GDP implicit price deflator (annual % growth)			
Value added in agriculture (% of GDP)	30.0	27.0	28.3
Value added in industry (% of GDP)	26.5	26.0	25.0
Value added in services (% of GDP)	43.5	47.0	46.7
Exports of goods and services (% of GDP)	9.0	12.4	12.7
Imports of goods and services (% of GDP)	12.9	16.7	16.0
Gross domestic investment (% of GDP)	23.3	22.5	22.7
Central government revenues (% of GDP)	13.7	12.9	12.7
Overall budget deficit (% of GDP)	-7.2	-5.8	-5.4
Money and quasi money (annual % growth)			
<b>Technology and Infrastructure</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>
Telephone mainlines (per 1,000 people)	6	17	19
Cost of 3 min. local call (\$)	0.04	0.03	0.03
Personal computers (per 1,000 people)	0	2	3
Internet hosts (per 10,000 people) 1998 refers to Jul 1999		0.06	0.17
Paved roads (% of total)	38	35	57
Aircraft departures (thousands)	245	315	323
<b>Trade and Finance</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>
Trade as share of PPP GDP (%)	4.5	5.1	4.8
Trade growth less GDP growth (average %, 1988-98)			
High technology exports (% of manufactured exports)	2	4	
Net barter terms of trade (1995=100)			
Foreign direct investment (\$ millions)	464	4,908	3,659
Present value of debt (\$ millions)			
Total debt service (\$ millions)	11,507	17,858	16,389
Short term debt (\$ millions)	12,371	8,223	7,163
Aid per capita (\$)	5	3	4

Source: The World Bank, *The Little Data Book* (Washington, D.C.: The World Bank, 2000).

**Table 2a: Individual Country Development Indicators (Pakistan and India)**

	PAKISTAN	INDIA
Population (millions)	132	980
Surface area (1,000 sq. km)	796	3288
GNP (\$ millions)	61,451	427,407
Population growth (%)	2.4	1.8
Population per sq. km	171	330
GNP per capita (\$)	470	440

People	PAKISTAN			INDIA		
	1990	1997	1998	1990	1997	1998
Life expectancy (years)	59	62	62	60	63	63
Fertility rate (births per woman)	6	5	5	4	3	3
Infant mortality rate (per 1,000 live births)	111	95	91	80	71	70
Under 5 mortality rate (per 1,000 children)	138	136	120	112	88	83
Child malnutrition (% of children under 5)	40	38			53	
Urban population (% of total)	32	35	36	26	27	28
Rural population density (per sq. km of arable land)	359	395		388	431	
Illiteracy—males (% of people 15 and above)	50	43	42	38	34	33
Illiteracy—females (% of people 15 and above)	79	72	71	64	58	57
Net primary enrollment (% of relevant age group)				75	77	
Net secondary enrollment (% of relevant age group)				56	60	
Girls in primary school (% of enrollment)	34			43	43	
Girls in secondary school (% of enrollment)						
<b>Environment</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>
Forests (thousands of sq. km)	20	17		650	650	
Deforestation (% change 1990-1995)		2.9			0.0	
Water use (% of total resources)		37.2	61.0		18.2	26.2
CO <sub>2</sub> emissions (metric tons per capita)	0.6	0.8		0.8	1.1	
Access to sanitation (% of urban population)	48	53		82	85	
Access to safe water (% of urban population)	84	77			46	
Energy use per capita (kg of oil equivalent)	400	442		424	479	
Electricity use per capita (kWh)	267	333		254	363	

Economy	PAKISTAN			INDIA		
	1990	1997	1998	1990	1997	1998
GDP (\$ millions)	40,010	63,020	63,369	322,737	420,782	430,024
GDP growth (annual %)	4.5	1.2	3.3	5.7	5.0	6.1
GDP implicit price deflator (annual % growth)	6.5	13.3	7.8	10.9	5.6	8.9
Value added in agriculture (% of GDP)	26.0	26.4	26.4	30.8	27.5	29.3
Value added in industry (% of GDP)	25.2	24.5	24.7	27.1	26.1	24.7
Value added in services (% of GDP)	48.8	49.1	48.9	42.1	46.4	45.9
Exports of goods and services (% of GDP)	15.5	15.5	15.8	7.1	10.7	11.0
Imports of goods and services (% of GDP)	23.4	22.9	20.2	9.8	14.1	13.8
Gross domestic investment (% of GDP)	18.9	17.7	17.1	24.6	23.4	23.6
Central government revenues (% of GDP)	19.1	15.6	15.8	12.5	12.2	12.0
Overall budget deficit (% of GDP)	-5.4	-7.7	-6.3	-7.5	-5.6	-5.2
Money and quasi money (annual % growth)	11.6	19.9	7.9	15.1	17.7	18.2
<b>Technology and Infrastructure</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>
Telephone mainlines (per 1,000 people)	8	19	19	6	19	22
Cost of 3 min. local call (\$)	0.04	0.03	0.03	0.04	0.02	
Personal computers (per 1,000 people)	1	3	4	0	2	3
Internet hosts (per 10,000 people) <i>1998 refers to Jul 1999</i>		0.07	0.22		0.05	0.18
Paved roads (% of total)	54	56	57	47	46	
Aircraft departures (thousands)	66	73	69	126	183	196
<b>Trade and Finance</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>
Trade as share of PPP GDP (%)	9.7	8.7	8.2	3.6	4.2	3.9
Trade growth less GDP growth (average %, 1988-98)			0.3			5.1
High technology exports (% of manufactured exports)		0	0	3	5	
Net barter terms of trade (1995=100)	91	99		79	83	
Foreign direct investment (\$ millions)	244	729	500	162	3,577	2,635
Present value of debt (\$ millions)			26,167			84,259
Total debt service (\$ millions)	1,926	4,071	2,743	8,191	12,415	12,085
Short term debt (\$ millions)	3,185	2,481	2,205	8,544	5,046	4,329
Aid per capita (\$)	10	5	8	2	2	2

Source: The World Bank, *The Little Data Book* (Washington, D.C.: The World Bank, 2000).



**Table 2b: Individual Country Development Indicators (Nepal and Bangladesh)**

	NEPAL	BANGLADESH
Population (millions)	23	126
Surface area (1,000 sq. km)	147	144
GNP (\$ millions)	4,889	44,224
Population growth (%)	2.3	1.6
Population per sq. km	160	965
GNP per capita (\$)	210	350

People	NEPAL			BANGLADESH		
	1990	1997	1998	1990	1997	1998
Life expectancy (years)	54	57	58	55	58	59
Fertility rate (births per woman)	5	4	4	4	3	3
Infant mortality rate (per 1,000 live births)	101	79	77	91	75	73
Under 5 mortality rate (per 1,000 children)	138	117	107	136	104	96
Child malnutrition (% of children under 5)		57		66	56	
Urban population (% of total)	9	11	11	19	23	23
Rural population density (per sq. km of arable land)	748	686		975	1204	
Illiteracy—males (% of people 15 and above)	53	44	43	54	50	49
Illiteracy—females (% of people 15 and above)	86	79	78	77	72	71
Net primary enrollment (% of relevant age group)	81	78		64	75	
Net secondary enrollment (% of relevant age group)	52	55		22	22	
Girls in primary school (% of enrollment)	37	38		45		
Girls in secondary school (% of enrollment)	27			33		
<b>Environment</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>
Forests (thousands of sq. km)	51	48		11	10	
Deforestation (% change 1990-1995)		1.1			0.8	
Water use (% of total resources)		1.6	13.8		1.0	1.2
CO <sub>2</sub> emissions (metric tons per capita)	0.0	0.1		0.1	0.2	
Access to sanitation (% of urban population)		34		20	77	
Access to safe water (% of urban population)	66			42	47	
Energy use per capita (kg of oil equivalent)	311	321		190	197	
Electricity use per capita (kWh)	28	39		43	76	

Economy	NEPAL			BANGLADESH		
	1990	1997	1998	1990	1997	1998
GDP (\$ millions)	3,628	4,922	4,783	29,855	41,040	42,702
GDP growth (annual %)	4.6	5.0	2.3	6.6	5.3	5.1
GDP implicit price deflator (annual % growth)	10.7	7.3	3.3	4.9	1.0	5.3
Value added in agriculture (% of GDP)	51.6	41.4	40.5	28.3	23.1	22.2
Value added in industry (% of GDP)	16.2	22.9	22.2	23.6	27.1	27.9
Value added in services (% of GDP)	32.1	35.7	37.3	48.1	49.8	49.9
Exports of goods and services (% of GDP)	10.5	26.3	23.2	6.3	12.4	13.8
Imports of goods and services (% of GDP)	21.1	37.7	34.4	13.8	18.7	18.9
Gross domestic investment (% of GDP)	18.4	23.3	21.7	18.9	21.6	22.2
Central government revenues (% of GDP)	8.5	10.5	10.6	8.4		
Overall budget deficit (% of GDP)	-6.8	-3.9	-4.7	-0.3		
Money and quasi money (annual % growth)	18.5	15.8	24.0	10.4	9.8	11.4
<b>Technology and Infrastructure</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>
Telephone mainlines (per 1,000 people)	3	7	8	2	3	3
Cost of 3 min. local call (\$)	0.03	0.02	0.02	0.04	0.03	0.04
Personal computers (per 1,000 people)						
Internet hosts (per 10,000 people) <i>1998 refers to Jul 1999</i>		0.07	0.07		0.00	0.00
Paved roads (% of total)	38	42		7	10	
Aircraft departures (thousands)	26	28	29	13	13	12
<b>Trade and Finance</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>
Trade as share of PPP GDP (%)	5.5	8.0	6.5	4.7	6.9	7.0
Trade growth less GDP growth (average %, 1988-98)			8.6			7.2
High technology exports (% of manufactured exports)				0	0	0
Net barter terms of trade (1995=100)				115	103	
Foreign direct investment (\$ millions)	6	23	12	3	141	308
Present value of debt (\$ millions)			1,498			10,092
Total debt service (\$ millions)	71	98	88	791	705	683
Short term debt (\$ millions)	24	28	31	156	175	150
Aid per capita (\$)	23	18	18	19	8	10

Source: The World Bank, *The Little Data Book* (Washington, D.C.: The World Bank, 2000).

**Table 2c: Individual Country Development Indicators (Maldives and Sri Lanka)**

	MALDIVES	SRI LANKA
Population (millions)	0.263	19
Surface area (1,000 sq. km)	0	66
GNP (\$ millions)	296	15,176
Population growth (%)	2.6	1.2
Population per sq. km	875	291
GNP per capita (\$)	1,130	810

People	MALDIVES			SRI LANKA		
	1990	1997	1998	1990	1997	1998
Life expectancy (years)	62	67	67	71	73	73
Fertility rate (births per woman)	6	5	4	3	2	2
Infant mortality rate (per 1,000 live births)	60	32	31	19	17	16
Under 5 mortality rate (per 1,000 children)	84	39	34	23	19	18
Child malnutrition (% of children under 5)		43			38	
Urban population (% of total)	26	26	26	21	23	23
Rural population density (per sq. km of arable land)	15,783	18,975		1,528	1,652	
Illiteracy—males (% of people 15 and above)	6	4	4	7	6	6
Illiteracy—females (% of people 15 and above)	6	4	4	15	12	12
Net primary enrollment (% of relevant age group)				100	100	
Net secondary enrollment (% of relevant age group)				76	76	
Girls in primary school (% of enrollment)	49	49		48	48	
Girls in secondary school (% of enrollment)						
<b>Environment</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>
Forests (thousands of sq. km)				19	18	
Deforestation (% change 1990-1995)					1.1	
Water use (% of total resources)					14.6	
CO <sub>2</sub> emissions (metric tons per capita)	0.7	1.2		0.2	0.4	
Access to sanitation (% of urban population)		95		33	33	
Access to safe water (% of urban population)	98	98		43	43	
Energy use per capita (kg of oil equivalent)				322	386	
Electricity use per capita (kWh)				153	227	

Economy	MALDIVES			SRI LANKA		
	1990	1997	1998	1990	1997	1998
GDP (\$ millions)	146	342	368	8,032	15,091	15,707
GDP growth (annual %)	16.3	6.2	6.8	6.2	6.4	4.7
GDP implicit price deflator (annual % growth)	4.4	6.2	0.8	20.3	8.8	8.8
Value added in agriculture (% of GDP)	21.9	17.0	16.4	26.3	21.9	21.1
Value added in industry (% of GDP)				26.0	26.9	27.5
Value added in services (% of GDP)				47.7	51.2	51.4
Exports of goods and services (% of GDP)	36.1			30.2	36.5	36
Imports of goods and services (% of GDP)	94.4			38.1	43.6	42.4
Gross domestic investment (% of GDP)				22.2	24.4	25.4
Central government revenues (% of GDP)	33.0	41.1	41.1	21.1	18.5	17.3
Overall budget deficit (% of GDP)	-12.3	-2.0	-5.3	-7.8	-4.5	-8.0
Money and quasi money (annual % growth)	18.7	23.1	22.8	21.1	13.8	9.6
<b>Technology and Infrastructure</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>
Telephone mainlines (per 1,000 people)	29	66	71	7	19	28
Cost of 3 min. local call (\$)	0.04	0.06		0.02	0.03	
Personal computers (per 1,000 people)		12		0	4	
Internet hosts (per 10,000 people) 1998 refers to Jul 1999		1.99	8.06		0.33	0.52
Paved roads (% of total)				32	95	95
Aircraft departures (thousands)	1	3	6	8	9	9
<b>Trade and Finance</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>	<b>1990</b>	<b>1997</b>	<b>1998</b>
Trade as share of PPP GDP (%)	34.9	39.0	38.2	12.2	18.1	17.9
Trade growth less GDP growth (average %, 1988-98)						3.2
High technology exports (% of manufactured exports)				1	1	
Net barter terms of trade (1995=100)				83	106	
Foreign direct investment (\$ millions)	6	8	11	43	430	193
Present value of debt (\$ millions)			119			6290
Total debt service (\$ millions)	9	28	14	384	428	452
Short term debt (\$ millions)	14	7	10	405	480	433
Aid per capita (\$)	99	101	95	43	18	26

Source: The World Bank, *The Little Data Book* (Washington, D.C.: The World Bank, 2000).

## BIBLIOGRAPHY

---

- Ganguli, Prabuddha. "Patenting Innovations: New Demands in Emerging Contexts." *Current Science* 75, no. 5 (1998): 433-439.
- Mahbub ul Haq Human Development Centre. *Human Development in South Asia 1999: The Crisis of Governance*. Oxford: Oxford University Press, 1999.
- Nagel, Stuart S. *Promoting Prosperity: Via Economic and Technological Policy*. Lanham, Md.: Lexington Books, c2000.
- Prakash, Aseem and Jeffrey A. Hart, eds. *Globalization and Governance*. London and New York: Routledge, 1999.
- Prakash, Aseem and Jeffrey A. Hart, eds. *Responding to Globalization*. London and New York: Routledge, 2000.
- Shiva Ramu, S. *Globalisation and Indian Liberalisation*. Delhi: South Asia Publications, 1994.
- Spencer, Milton H. *Contemporary Economics*. 8th ed. New York: Worth Publishers, 1993.
- Standke, Klaus-Heinrich and M. Anandkrishnan, eds. *Science, Technology and Society: Needs, Challenges and Limitations*. New York: Pergamon Press, 1980.
- United Nations. Economic and Social Council Secretariat. *World Plan of Action for the Application of Science and Technology To Development*. New York, 1972. E/4962/Rev.2.
- United Nations General Assembly. *Report of the United Nations Conference on Science and Technology for Development. Vienna (20-31 August 1979)*. New York, 1979. A/CONF.81/16.
- The World Bank. *The Little Data Book*. Washington, D.C.: The World Bank, 2000.
- Young, Oran R., ed. *Global Governance: Drawing Insights from the Environmental Experience*. Cambridge, Mass.: MIT Press, 1997.