

The Provision of Regional Public Goods in South Asia

26 February 2010

This paper is prepared by Khaja Moinuddin under the supervision and guidance of the Director, SAOC and the South Asia RCI Team. Maria Lourdes Magaoay, Jane Barcenas-Bisuña and Eleanor Bacani also provided contributions in the preparation of this report.

The views expressed in this report are those of the author and do not necessarily reflect the views and policies of the Asian Development Bank (ADB) or its Board of Governors or the governments they represent.

ADB does not guarantee the accuracy of the data included in this publication and accepts no responsibility for any consequence of their use.

Use of the term "country" does not imply any judgment by the authors or ADB as to the legal or other status of any territorial entity.

ABBREVIATIONS

ADB	:	Asian Development Bank
BIMSTEC	:	Bay of Bengal Initiative for Multisectoral Technical and Economic Cooperation
BOVs	:	Battery operated vehicles
CDM	:	clean development mechanism
DA	:	Development Alternatives
FAO	:	Food and Agriculture Organization
GBM	:	Ganges-Brahmaputra-Meghana (Basin)
GDP	:	Gross Domestic Product
GHG	:	greenhouse gas
JFPR	:	Japan Fund for Poverty Reduction
IGA	:	intergovernmental agreement
IPCC	:	intergovernmental panel on climate change
MDG	:	millennium development goals
PGs	:	public goods
PPP	:	public-private partnership
RCI	:	regional cooperation and integration
RCIS	:	Regional Cooperation and Integration Strategy
RETA	:	regional technical assistance
RPGs	:	regional public goods
RSDD	:	Regional and Sustainable Development Department
SAARC	:	South Asian Association for Regional Cooperation
SASEC	:	South Asia Subregional Economic Cooperation
SARD	:	South Asia Department
SECSCA	:	Subregional Economic Cooperation for South and Central Asia
UN	:	United Nations
UNEP	:	United Nations Environment Program
UNODC	:	United Nations Office on Drugs and Crime

CONTENTS

	Page
EXECUTIVE SUMMARY	i
I. Introduction	1
II. Why a Study on RPGs for South Asian Development Bank	4
III. Scope of the Study – A Conceptual Framework for Prioritizing RPGs for the Study	5
IV. A Review of RPG Provision in South Asia and Scope for Regional Cooperation	6
A. Global Warming and Climate Change	6
B. Clean Energy and Energy Efficiency	12
C. Environment	18
D. Food Security	21
E. Natural Disaster Response	24
F. Fighting Communicable Diseases	25
G. Fighting Drugs and Human Trafficking	27
H. Governance	28
V. Cross Border Infrastructure Management Issues	29
VI. Best Practices in the Management of RPGs	32
VII. RCIS and a Review of approaches for Providing RPGs in SARD	33
VIII. Recommendations	36
APPENDICES	
1 Table 1. ADB RETA Approvals for SARD Countries with RPG Implications, 2006 – 2009	40
Table 2. ADB RETA Proposals for SARD Countries with RPG Implications, 2010 – 2012	41
2 Table 1. ADB Loans/Grant Approvals for SARD Countries with RPG Implications, 2006 – 2009	42
Table 2. ADB Loans/Grant Proposals for SARD Countries with RPG Implications, 2010 – 2012	45

Executive Summary

This report reviews the provision of high priority regional public goods (RPGs) selected for the South Asia subregion. As part of this review the report proposes areas of cooperation for improving the provisioning of RPGs in South Asia. The report highlights the issues in cross border management of infrastructure projects and best practices in the provisioning of RPGs relevant for South Asia. It also evaluates ADB's contributions to providing RPGs in the subregion. The report concludes with recommendations on ADB's South Asia Regional Department (SARD)'s role in the provision of RPGs in the subregion.

When the domain of public goods (PGs) extends over a well defined region comprising several countries, they may be viewed as RPGs. At a general level all regional cooperation and integration (RCI) activity could be regarded as an RPG since the classical properties of publicness viz. non rivalry and non excludability are found in RCI as an activity. This is not operationally useful. A more operationally helpful approach is taken in ADB's RCI Strategy (RCIS) prepared in 2006 which views RPGs as one of the four pillars of RCI activity. The following RPGs have been identified in the RCIS: clean air, environmental protection, control of communicable diseases, natural disaster response and dissemination of knowledge. This list with some additions has been adopted in ADB's study of Regional Public Goods in 2007 and in this report.

If national PGs bestow substantial indirect and unintended cross border benefits to other countries in the region it may be reasonable to view them as potential RPGs. However, the challenge is to secure their optimal provisioning through coordinated action of all the regional countries involved. This is the first best approach to the provision of RPGs. Specific RPG activities can also be designed for the entire region. This is the second best approach to the provision of RPGs and has been ADB's main instrument for providing RPGs. The regional coordination of national activities involving cross border externalities and the provisioning of specific RPGs at the regional level may be called the RPG approach to RCI. Global PGs are different from RPGs and provide benefits with world-wide coverage e.g. research for AIDS, Copenhagen Accord etc.

In this study RPGs are those whose main benefit accrues to the countries constituting the region e.g. clean water in rivers that flow across countries in the region, mitigation of air pollution generated in a group of countries which affects them more than it affects the rest of the world. Thus activities in environment, communicable diseases etc, are more RPGs than global PGs, since they affect the regional population much more than population outside the region.

The geographical proximity and the cultural homogeneity within the South Asian countries provide the main rationale for identifying South Asia as a region for this study. There is ample scope for SARD countries to cooperate in the provision of several RPGs including environment, health, transport and communications and knowledge. There has not been sufficient attention paid to RPGs in South Asia since many of these overlap with global PGs. There are RPGs with very little global implications such as management of water in the Ganges-Brahmaputra-Meghana (GBM) basin. Because of the free rider problem inherent in the provision of RPGs it is necessary to evolve mechanisms for sharing of costs in the provision of RPGs in

an equitable manner. Multilateral institutions such as ADB can play the role of an honest broker for evolving approaches and methods for arriving at equitable distribution of costs of providing RPGs among the beneficiary countries. They can also help promote open regionalism and finance some of the costs of RPGs, particularly knowledge products at the regional level.

Climate change response, clean energy, environment, control of communicable diseases, food security, furtherance of good governance, control of human and drug trafficking and coordinated natural disaster management have been identified as RPGs in the terms of reference (TORs) for this study. These RPGs are of high priority for South Asia and the also for the Asia Pacific region. The question of uniformity of the definition of RPGs across all the operational departments of ADB could be dealt with by allowing different operational departments to define their prioritized RPGs a priori so that under the project classification system approved RCI projects could be appropriately classified as belonging to the fourth pillar of RCIS.

In this study the coverage of RPGs excludes merit goods and club goods such as regional infrastructure projects which are viewed as a separate pillar in the RCIS. However this study deals with the issues in regional infrastructure provision as a separate subject. The study also excludes the study of the positive externalities of regionalization of private sector investments which is important for RCI.

Scientific opinion is strongly supporting the premise that global warming is caused by greenhouse gases (GHG). The major implications of climate change are threat to food security, health hazards, water insecurity, more frequent natural disasters, rising sea levels and degraded bio systems and bio diversity. However, the exact implications of global warming for South Asia are not clearly understood. The main GHGs are carbon dioxide (CO₂), water vapor, methane, nitrous oxide, and ozone. Water vapor and CO₂ together contribute the major part of the greenhouse effect. The output of these gases is a function of the level of energy used for household, commercial and industrial purposes.

China, US, EU, Russia and India are the world's largest producers of GHG. Less GHG production by India will contribute to reducing global warming. However the immediate beneficiaries of less atmospheric pollution will be the neighboring countries most of which are in South Asia. Except for India other countries in the subregion are not significant contributors of GHG. Bhutan wishes to preserve its pristine environment and is virtually a zero contributor to greenhouse gas emissions. But it may be severely affected by global warming. Maldives along with Bangladesh and Sri Lanka may also be severely affected as oceans rise due to global warming. All the countries in the subregion are taking action to reduce industrial and transport related pollution by encouraging the use of renewable energy and energy conservation measures. There is scope for pursuing regional cooperation in reforestation and reducing industrial pollution by adopting regional environmental standards including for efficient energy use. A major priority is developing a reliable regional data base to forecast the impact of global warming on the regional economies and social systems.

Clean energy is largely an urban problem caused by urbanization and industrial development. Almost all cities of South Asia suffer from rapidly deteriorating air quality due to increasing use of fossil fuels in transportation, power generation, industrial applications and cooking and lighting of households; inefficient use of energy and underpricing of energy. The main issue is the rampant use of coal and gas. Clean energy alternatives include development of hydro power, wind, solar and tidal energy, increasing efficiency of energy utilization through

adoption of energy efficient technologies and policies and demand management through economic pricing of energy. As economic development accelerates in the subregion, use of clean and efficient energy use will be important for mitigating pollution loads in the region.

All the South Asian countries have launched several initiatives in the area of clean energy and energy efficiency. India's initiatives include developing the technical capacity to design and implement renewable energy projects. Bangladesh aims to achieve 20 per cent of its energy production from green sources by 2020. Sri Lanka wishes to add at least 500 MW of renewable energy capacity by 2016 by tapping donor funds. Nepal has the potential to generate 43000 MW of hydro power. This can meet Nepal's energy requirements besides providing a surplus for export to energy deficient countries in the subregion provided appropriate mechanisms for cross border trading in power could be established. Bhutan is also blessed with a huge potential for hydro power which can meet its requirements besides providing a surplus for export.

Developing workable models using the Bhutan-India example for cross border trading in power will help to boost the use of hydro power in the region and reduce the reliance on coal which is the major energy and polluting source in the region. The South Asian countries could also share knowledge in renewable energy, energy conservation and successful approaches for increasing energy efficiency including economic pricing of energy.

Apart from clean energy, energy efficiency and measures to combat global warming the other environmental RPGs important for South Asia are water management and preservation of bio diversity. Water management in the Ganges Brahmaputra Meghana (GBM) and the Indus basins should be approached as an important RPG. The Helmand basin is predominantly located in Afghanistan and does not pose major RPG implications. Water drought caused by global warming will result in heightened competition of available fresh water resources in the region.

South Asia is home to 14% of the world's biodiversity resources. However, many of the species are under threat due to increasing competition for land from high population growth and encroachment of the forests through intrusive human activity. Improved regional cooperation will be required to reduce the threat of extinction facing some species living in forest habitats spanning more than one country (e.g. the Sunderbans for the Royal Bengal tiger). Increased cooperation among maritime nations in South Asia will also be needed for preserving the rich biodiversity found in the region's marine ecology.

The RPG dimension of the use of water in the river basins can be better addressed through getting people and communities more involved in water management, increasing efficiency of water use in agriculture, more investment in water conservation, and preventing over exploitation of the rivers. Regulation of ground water extraction in the basins is also a priority. Preparing a database on the clean water and biodiversity resources of the region and their vulnerability to global warming and pressures of urbanization and industrialization will be the first step in formulating a regional strategy to preserve these RPGs.

Agriculture is an important provider of income and employment in the region. Global warming could threaten this activity imperiling food security in the region. The 2007 crisis when the prices of food grains rose sharply, has highlighted the fragile condition of food security in the region. The productivity of agriculture in South Asian countries is generally low compared to the advanced countries and China which suggests that food security in the region can be improved through better farming technology.

Food security in the region could be improved through sharing of knowledge on farming technology and practices among South Asian countries and reducing barriers among them in the trade for food grains. The recent agreement on the food bank under the SAARC framework is a welcome step. The region could also benefit through liberalization of food prices which will benefit the farmers and motivate them to allocate more investment for agriculture. A study of the threat to food security posed to the region due to global warming and the policies needed to address it at a regional level is a priority.

Natural disaster response and management has traditionally been viewed as a national PG. It becomes an RPG when the natural disaster affects more than one country in the region. The subregion has witnessed recently severe changes in weather patterns. It therefore seems necessary to view natural disaster management as an RPG rather than treat it only as a national PG.

A coordinated strategic approach to NDR management in South Asia facing the possibility of common catastrophic events such as earthquakes and floods in rivers shared by more than one country can be considered. Another area of RPG enhancement is by pooling resources in the region for disaster relief after the event. Prior to seeking international relief the South Asian countries could first attempt to address the fiscal dimensions of the problem as a regional issue. A study of mechanisms available in other regions to coordinate NDR on a regional basis will be a helpful start.

The major infectious diseases (IDs) afflicting South Asia include HIV/AIDS, TB and malaria. The new and emerging IDs include the dengue, severe acute respiratory syndrome, avian influenza and flu caused by AH1N1 virus. The chances of the trans-border migration of these IDs have increased with the growing globalization and RCI. Supported by World Health Organization (WHO) the South Asian countries are implementing national programs to address the various IDs. All these programs have RPG implications to the extent that suppression of IDs in one country in the region will lessen the chances of their trans-border transmission.

Apart from the national programs, regional approaches could also be considered for fighting IDs. These include regionally financed R&D on these diseases and launching region-wide awareness-raising programs on the causes of the diseases and the preventive actions. In view of the technical nature of these initiatives collaboration with WHO would be needed to avoid duplication and wastage of resources.

According to the UN Office on Drugs and Crime South Asia is home to a vast number of victims of human trafficking. An important consequence has been an increase in the number of minor girls contracting HIV/AIDS. Illegal drug trafficking is also a lucrative trade in the subregion due to the high levels of unemployment and poverty in the subregion. Much of the national level response to the growing menace of drug and human trafficking has been to apprehend and prosecute human traffickers and drug offenders. To the extent that punishment of offenders discourages drug and human trafficking occurring across the border, this national action will have RPG implications. However, in view of the enormous profits involved in the trade, it is doubtful whether this has had a deterrent effect on the offenders. Law enforcement agencies given their multitude of functions also do not seem to attach priority to this problem.

A regional approach to enhance the fight against human and drug trafficking would include measures such as coordination of intelligence on drug producers and human traffickers in the subregion so that they could be kept under close surveillance. Education of the population

on the harmful effects of illegal drugs and the practices and methods of human traffickers to trap unsuspecting victims could also be efficiently organized as a regional initiative. A joint study of UN with South Asian Association for Regional Cooperation (SAARC) to identify the dimensions of the human and drug trafficking problem in the subregion and steps that should be taken to raise the awareness of law enforcement agencies to the growing menace will be a helpful start to tackle the problem systematically.

There is not much available in literature on governance as an RPG. Governance has national, global and regional dimensions. Some governance activities will have more RPG than global or national implications. For e.g. facilitating cross border movement of goods and persons through streamlined procedures and processes or framing business rules to facilitate cross border investments under a regional cooperation framework will help intra regional trade more than global trade and is an RPG. RCI has also meant cross border movement of capital; while most of it is legitimate and should be encouraged there is a possibility that some of it could be by way of escaping surveillance and tax accountability in the parent country. This could be a subregional “bad”.

Following the Latin American model, efficiency in the provision of governance in South Asia can be improved through investing in regional institutions for training public sector staff in the South Asian countries and for inculcating shared values in public administration and governance standards among the trainees. Anti money laundering could also be better addressed as a regional initiative through sharing of intelligence on capital movements. Recent experience in managing the Global Economic Crisis and Food Crisis has highlighted the importance of avoiding beggar thy neighbor policies. Sharing information on macroeconomic policies among the South Asian countries can have important RPG implications since it will be helpful in improving macroeconomic management among the South Asian DMCs. A study of governance as an RPG in South Asia will be useful start.

Top down cross border infrastructure development is more a merit good and does not strictly meet the criteria for an RPG in the same manner as the other RPGs reviewed above. The RCIS and the 2007 ADB study on RPGs do not include cross border infrastructure as an RPG. However cross border infrastructure bestows important externalities by sparking regional economic development and is a key instrument for strengthening RCI.

There is no readily available information based on which the extent of knowledge of management of cross border infrastructure projects in South Asia can be assessed. Nevertheless some conclusions based on experience relevant for South Asia could be drawn. First, under appropriate conditions getting the private sector to invest in cross border infrastructure through PPP and incentives though difficult is doable. Second, Regional Product Chain network development (regionalization) has tended to occur mostly along the sea coast. It is possible to conceive infrastructure projects to connect interior and land-locked areas but these will involve huge present costs and future benefits. The investors must be willing to await the future benefits- this will require long term commitments from them. Third, if coordination failures could be avoided, the overall profitability of a project comprising several segments can be improved. Finally cross border infrastructure projects generally involve the engagement of local governments, which adds one more layer to the complexity of their management.

Several issues have to be addressed in implementing cross border infrastructure projects. First, while cross border development contributes to faster reduction of poverty and accelerates economic development in the region, the process of securing international agreements (IGAs) on achieving interconnectivity and interoperability of the concerned national

networks is difficult and time consuming. Second, the costs of cross border infrastructure development can be huge and a major fiscal drain; it is easier to secure IGAs on two-way transmission systems in cross border infrastructure (telecom, transport) than in one way transmission systems (power, water). Third, land-locked and interior countries in the interconnected networks tend to get marginalized in the market-driven regionalization process; to overcome this constraint governments may have to intervene to provide incentives to support the left behind areas. Fourth, non physical aspects of cross border infrastructure development (e.g. telecom development and regulation policy, cross-border trade facilitation) are important for deriving full benefits from the physical investments in infrastructure. Fifth, an honest broker (such as ADB) may need to be engaged to resolve issues in forging commercial agreements in cross border energy provision.

Effective management of cross border infrastructure development would involve investing in national infrastructure projects which offer the maximum scope for interconnection of networks; promoting specific economic corridors and networks by putting in place high quality services in these; achieving smooth cross border movement of people and goods through facilitation at borders; developing border towns so that the transition of goods and people across the border is seamless as much as possible; creating specific nodes (such as border towns) for demonstration purposes; reducing transaction costs; providing incentives for developing regional production chain networks and SMEs particularly along the network pathways; involving stakeholders, particularly private sector in planning and strategizing the cross border infrastructure projects , and instituting an Early Warning System involving the stakeholders to identify and resolve emerging issues in cross border project management before they evolve as major bottlenecks.

There is not much literature available on the economic analysis of cross border projects. There are few actual project examples. At a conceptual level, the main challenges in the exercise are valuing externalities and the distribution analysis of net benefits. The latter could provide a basis for sharing of costs between countries participating in the project and could turn out to be contentious.

There are several examples of good practices in provisioning of RPGs relevant for South Asia. First and foremost, RPG approach to RCI requires strong “regionalism” i.e. involvement of the governments concerned. Supporting the provisioning of national PGs which could have regional impacts (e.g. clean energy, control of communicable diseases) is relatively straight forward. The financing of these activities will be from the concerned national budgets. The challenge in the RPG approach is for the regional governments to take coordinated action to secure the optimal provisioning of the RPGs. This requires that the regional member countries are strongly committed to RCI. The subregional RCI framework must be fully functional for moving forward with the RPG approach. If this condition is met, institutions such as ADB can assist the regional country groups to identify the priority projects for the provision of RPGs. There should also be consensus in the group of countries regarding the prioritization of RPGs and their financing in the concerned national budgets. This in turn will require coordination of national budgets. Second, technical cooperation on specific RPGs (e.g. clean energy and control of communicable diseases) among the participating countries offers good prospects for evolving regional objectives and approaches for the provisioning of RPGs. Third, apart from the national budgets, multilateral development banks (MDBs) such as ADB can also finance RPGs. But, in view of the costs and difficulties in coordination, MDB initiatives generally focus on provision of software aspects of RPG and knowledge. MDBs can also play the role of an honest broker in negotiating agreements among participating countries. Fourth, the IADB instituted a fund in 2004 for non-reimbursable financing of regional projects which satisfy the twin criteria of

publicness. These funds could be used for both technical assistance and physical investment. ADB's RCI Fund approved in 2007 supports TAs in the area of RCI. The recently instituted SAARC Fund is another example of a good practice of dedicating a funding source for financing RPGs.

ADB's new project classification system seems to view all RCI as RPGs. It is operationally more meaningful to deal with RPGs as a separate pillar or as "Other RPGs". It is difficult to state what ADB's contribution has been in providing "Other RPGs" since the inception of RCIS. Much of the analysis of the 2007 report of ADB relates to pre RCIS data which does not capture the priority shown by ADB to RPGs since adopting the RCIS.

55% of the RETAs provided during 2006-2009 by SARD has been for RPGs even though the concerned project documentation has not explicitly recognized the RPG implications of the RETA. An assessment of the country strategy and operations papers in South Asian countries shows that RPGs other than clean energy have not been explicitly targeted nor do they figure significantly in ADB's financial and technical assistance programs during 2010-2012. This is understandable since a meaningful RPG program is dependent on strong regional cooperation being first established in the region. Regional cooperation and integration is a work in progress in South Asia.

For SARD to move forward on RPGs it must be clearly recognized that RPGs are a high operational priority. Country operations will tend to focus only on the areas of high operational priority. As a start, the provision of RPGs described in the TORs may be recognized as an operational priority in RCI for the SARD subregion.

In order for the RPG approach to take root it is necessary that RCI must be strengthened in the region. Repeated interactions among players help to reveal their preferences. This is a key step in the optimal provisioning of RPGs. A top priority is to further empower and institutionalize RCI platforms such as SAARC, SECSCA, SASEC and BIMSTEC which are important for South Asia regional cooperation. More opportunities for RCI activities among South Asian DMCs should be explored in these platforms.

In view of the resource constraint and the need for balanced allocation of resources among the four pillars of the forthcoming RCI strategy of SARD, it will be necessary for SARD to prioritize the RPGs for operational purposes. Since climate change concerns have emerged as a top development priority in SAARC, environment related RPGs may be given the highest priority in allocating resources for RCI in SARD. Advancing the RETA on climate change included in the 2011 program may be considered. Other follow on RETAs on climate change could be also considered to establish ADB as a solid partner in the dialogue on climate change and its consequences in the subregion

Prioritization of RPGs should also be based on ADB's involvement at the national level in the provision of the concerned RPG. Health is not an operational priority for ADB in Strategy 2020 and does not figure prominently in any of the country strategies in South Asia. Hence communicable disease control may not be viewed as an RPG priority except in the context of having to address it as a "public bad" due to climate change.

Future support for governance would benefit from a strategic approach to capacity building in governance. While ad hoc capacity building may be important to meet short term needs a preferred approach is to build a capacity building program based on a long term plan of capacity development to meet strategic development objectives.

It will be useful to assess the progress in implementing the various Conventions and agreements concluded between the participating countries under the SAARC framework. This exercise will help reveal the priorities of the SAARC members in the provision of RPGs and help to lay the foundation for a solid RPG approach to RCI in the subregion.

ADB should encourage immediate activation of the SAARC Fund. It should consider supporting cross border provision of RPGs using the Fund. For example, it can co-finance such activities with the Fund. Early untied contributions from ADB to the Fund will also demonstrate ADB's confidence in the Fund modality and commitment to evolving South Asia as a success case in RCI.

ADB should take the initiative to coordinate the provision of the RPGs in the subregion in partnership with the concerned UN agencies which are also in the business of providing RPGs. The latter are not generally familiar with the RPG approach to RCI and tend to view activities in their jurisdiction such as environment, communicable diseases control etc as global PGs. The RPG dimension of several of these activities should be dialogued with these agencies to establish firm partnership agreements with them on the provision of RPGs.

ADB can play an important role in providing RETAs to enhance the knowledge of SARD countries in RPGs. Areas where ADB can contribute include studies on the impacts of global warming and urbanization on the subregion including its clean water resources, bio diversity and food security. If resources permit, the dimensions of the human trafficking, money laundering and drug problem in the subregion and the pathways by which criminal activities occur also need to be studied.

One key RPG not specifically covered in the TORs is dissemination of economic information which is a basic requirement for strengthening economic cooperation in the region. ADB can also help by coordinating dissemination of data and analysis of macroeconomic data. The work being carried out by Asia Regional Information Center (ARIC) for ASEAN could provide a precedent for this activity.

Apart from addressing the regionalism aspects ADB should explore the possibilities of sparking interest of the private sector in cross border projects. ADB can play an honest broker's role in forging PPPs and negotiating commercial agreements. ADB's guarantee mechanisms provide powerful instruments for alleviating project and country risks inherent in cross border investments.

The Provision of Regional Public Goods in South Asia¹

I. Introduction

1. There is no standard definition of Regional Public Goods (RPGs) unlike public goods (PGs) whose definition is well known in literature. PGs are those which satisfy the twin properties of non-excludability – viz. no consumer can be excluded from its consumption, say through the price mechanism or physical controls; and non-rivalry- viz. the consumption of the good by one person does not diminish its availability for use by others. When the domain of the PGs relates to the consumers in a defined region comprising several countries, those goods are termed Regional Public Goods (RPGs).

2. Recent literature has added a third dimension to the properties of public goods – viz. the typology of aggregation technology to describe how individual contributions by consumers combine to form the overall availability of the public good.² The concept of aggregation technology is particularly relevant for RPGs since not all RPGs are provided under the same arrangements of cost sharing. For example, a large country in the region with abundant resources could just provide the RPG under the “best shot” approach (e.g. agriculture research for the region); in other and more usual cases it may be necessary to provide for cost sharing under other approaches such as the “weighted sum” approach or “summation” approach (e.g. provision of clean air). Typically, optimal provisioning of RPGs has to deal with free rider and cost sharing issues.

3. RPGs could be viewed as outputs of regional cooperation agreements. The effectiveness of regional cooperation and integration (RCI) could be measured in terms of the quality and quantity of RPG outputs produced under them.³ At a general level all RCI activity could be regarded as an RPG since the classical properties of publicness viz. non-rivalry and non-excludability are found in RCI as an activity. However this approach blurs the focus on the provision of specific RPGs which is required from an operational point of view.

4. A more operationally helpful approach is to view specific RPGs as contributing to the strengthening or achieving of RCI. This is the approach taken in the ADB’s Regional Cooperation and Integration Strategy (RCIS)⁴ which views RPGs as one of the four pillars of

¹ South Asia for the purposes of this Paper comprises the membership of the South Asian Association for Regional Cooperation (SAARC), viz. India, Bangladesh, Bhutan, Sri Lanka, Maldives, Nepal, Pakistan and Afghanistan. These countries except last two constitute the operational jurisdiction of the South Asia Regional Department (SARD) of ADB.

² T. Sandler. 2002. *Chapter 1: Demand and Institutions for Regional Public Goods*. A. Estevadeordal et al. *Regional Public Goods from Theory to Practice*. The typology of aggregation technology includes six cases: summation, where overall provision of the PG comprises the sum of individual contributions; weighted sum, where the overall provision is a differentially weighted sum of individual contributions; weakest link, where smallest contribution determines the good’s aggregate level; weaker link, where the smallest contribution has the greatest influence on the goods’ aggregate level followed by the second smallest contribution etc; best shot, where the largest contribution determines the good’s aggregate level; and better shot where largest contribution has the greatest influence on the level of the provision of the good followed by the second largest etc. Examples are provided in the rest of the paper.

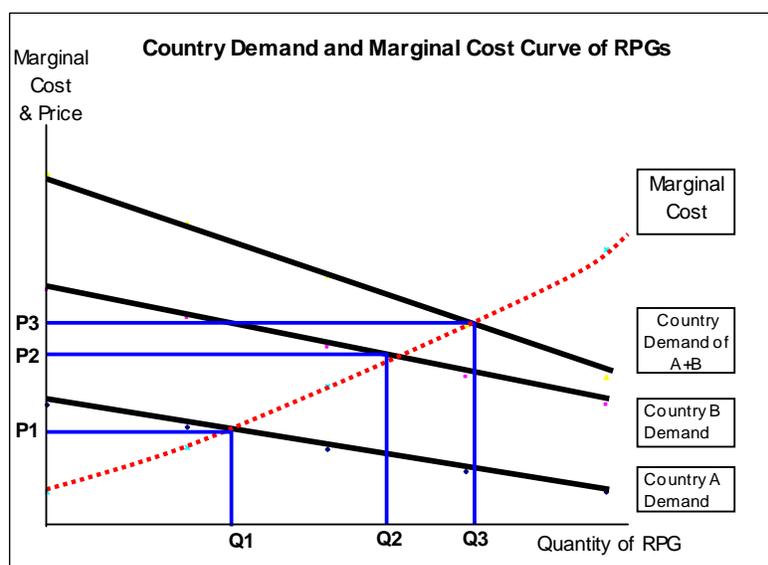
³ R. Devlin and A. Estevadeordal. 2002. *Chapter 8: Trade and Cooperation: A Regional Public Good Approach*. A. Estevadeordal et al. *Regional Public Goods from Theory to Practice*.

⁴ ADB. 2006. *Regional Cooperation and Integration Strategy*. Manila. The four pillars of the strategy are trade, infrastructure, finance and RPGs.

RCI strategy. The RCIS provides a useful operational framework for the provision of RPGs by identifying specific RPGs which are priority for the fourth pillar of the strategy.⁵ The RCIS has been incorporated into the long-term strategic framework of the Asian Development Bank 2008-2020⁶ – which provides the basis for ADB’s strategies and programs at the country and subregional levels.

5. A coordinated approach will help reveal consumer preferences for the RPG and help to determine its optimal provisioning. This is illustrated in Figure 1 for a two country case.⁷

Figure 1. Optimal Provisioning of RPGs



6. With coordination and cost sharing the total quantity of RPG supplied is Q_3 at combined price of P_3 . This is the optimal or desired level of the provisioning of the RPG where the marginal cost of the RPG supply equals the sum of the prices the two countries are willing to pay for it.⁸ Without such coordination country B will produce Q_2 units of the RPG and country A may choose to be a free rider (since at equilibrium its demand is only Q_1) resulting in the sub-optimal or under-provisioning of the RPG.⁹

⁵ RCIS, *ibid.* Also, see para.18 below

⁶ ADB. 2008. *Strategy 2020*. Manila.

⁷ This chart is a variation of the standard diagram used to illustrate the optimal provisioning of PGs (e.g. Case and Fair, 2006).

⁸ i.e. the provision of the RPG is efficient in the Samuelsonian sense (i.e. the sum of the two marginal benefits equals the marginal cost).

⁹ It is possible that that Country A may choose to produce Q_1 units of the RPG. The total production of the RPG would thus be Q_1+Q_2 which could exceed Q_3 . The resulting resource allocation (under the summation approach) will be inefficient and would be a case of overprovisioning of the RPG. However from a practical perspective overprovisioning of a public good (such as environment) may be preferable to its under provisioning. Extending the analytics of Figure 1 it could be argued that if a region consists of “n” countries with non intersecting demand curves and upward sloping marginal cost curve for the RPG, the country “j” with the highest location of the demand curve could become the provider of the RPG with all others choosing to be free riders, i.e. as the size of the regional group increases so does the potential for under or overprovisioning of the RPG. Thus, the larger the number of constituents in the region, the larger the potential benefit from coordination of the provision of RPGs or conversely, the more the potential of economic loss from lack of coordination.

7. A distinction may be drawn between national PGs, RPGs and global PGs. National PGs provide benefits mainly to the inhabitants of a country – for example, national defense or provision of internal security. However, there may be national PGs which bestow indirect and unintended cross border benefits to other countries in the region. If such benefits are substantial it may be reasonable to view them as de facto RPGs (e.g. control of a communicable disease causing vector in one country could have major unintended benefits to other countries in the region due to reduced scope of cross border transmission of the disease).¹⁰ However, if they are in fact regarded as RPGs the challenge is to secure their optimal provisioning through coordinated action of all the regional countries involved (e.g. coordination of clean energy and control of communicable diseases in South Asia). This would call for a regionally coordinated program on the provision of the RPG (e.g. clean air provision in South Asia) and is the first best approach to the provision of RPGs.

8. If there is agreement among the regional member countries, specific activities having RPG implications can be designed for the entire region (e.g. training of technical and management staff in clean water management for South Asia). This approach has been the main instrument of providing RPGs in SARD using the RETA modality and is a second best approach to provisioning RPGs.

9. The regional coordination of the provisioning of public goods involving cross border externalities and the provisioning of specific activities with RPG implications may be called the RPG approach to RCI. Given the challenge of strengthening RCI in the subregion, a careful and patient approach will be needed to implement the first best approach, viz. coordination of national level RPG activities.

10. Global PGs are different from and not to be confused with RPGs. Global PGs provide benefits with world-wide coverage e.g. research for AIDS, world-wide action to mitigate global warming through global agreements (e.g. Copenhagen Accord).

11. The RCIS defines RPGs as public goods whose benefits are shared by more than one country in the region.¹¹ However, this definition does not distinguish between global PGs and RPGs. In this study RPGs are viewed as those which satisfy the criteria of publicness and provide significant benefits to a region – i.e. the main benefit from the RPGs accrues to the countries constituting the region (e.g. water management in rivers that flow across countries in the region, mitigation of air pollution generated in a group of countries which affects them more than it affects the rest of the world). Thus in general activities in environment, communicable diseases etc, are more RPGs than global PGs, since they affect the regional population much more than the population outside the region.

12. This report reviews the provision of high priority RPGs selected for the South Asia subregion. As part of this review the report proposes areas of cooperation for improving the provisioning of RPGs in South Asia. The report reviews the issues in cross border management of infrastructure projects and best practices in the provisioning of RPGs relevant for South Asia. It also evaluates ADB's contributions to providing these RPGs in the subregion. The report concludes with recommendations on SARD's role in the provision of RPGs in the subregion.

¹⁰ This would be a case of (unintended) "better shot" approach.

¹¹ ADB. RCIS, 2006. *ibid.*

II. Why a Study on RPGs for South Asia?

13. Sandler defines a region as a territorial sub system that may be geological, geoclimatic, or geographical in terms of continental placements, cultural, or political.¹² In a clearly defined region the constituent countries share common cultural or economic values. It will be difficult for countries with disparate cultures and economic philosophies to coalesce as a region.

14. Both the Asia and Pacific and South Asia regions satisfy Sandler's definition of a region. The geographical proximity, broad cultural homogeneity within South Asia and shared values of social and economic development among the countries comprising the subregion provide the rationale to consider RPGs in the subregional context of South Asia.¹³ There are other reasons for studying the provisioning of RPGs in South Asia as well:

- There is ample scope for South Asian countries as a group to cooperate in the provision of several RPGs including environment, health and governance to their individual and combined benefit. Such benefits will redound more to the countries in South Asia than to countries outside the grouping. Simultaneous provision of RPGs by countries in South Asia will produce outcomes larger than the sum of the parts due to externalities.
- A good beginning in RCI has been made under the SAARC and other subregional cooperation programs in South Asia but much more remains to be done to consolidate the gains and strengthen RCI in the subregion and to reach the level of RCI achieved elsewhere. The RPG approach is a useful instrument for strengthening RCI in South Asia.
- There has not been sufficient attention paid to RPGs in South Asia since many of these overlap with global PGs. This might have resulted in giving lower priority to RPGs in allocating resources. This should be reversed since most of the externalities associated with these goods are impacting more at the subregional level than at the global level. It is necessary to move quickly on the RPGs so that quick wins could be achieved at the subregional level even if global action on these may be delayed. An example is a regional action plan on clean energy which need not necessarily wait for a global agreement on environment.
- There are cases of subregion specific RPGs. For example, water management in the Ganges-Brahmaputra-Meghna (GBM) basin is a well defined RPG with very little implications outside the subregion.¹⁴

¹² T. Sandler. Ibid.

¹³ It may be preferable to use the term "subregional PGs" to refer to South Asia specific RPGs. However the use of this terminology is not found in literature. In the literature on RPGs, the region is typically an aggregation of countries under a regional development framework- such as Latin American countries for Inter American Development Bank (IADB) and Asia-Pacific for ADB. Treatment of RPGs at subregional level is unusual but entirely logical.

¹⁴ The term "Ganges-Brahmaputra-Meghna Basin" is used by international development agencies including UNEP and World Bank to describe the watershed spread over the various countries through which these rivers flow. Originated in the [Gangotri](#) Glacier of the Himalayas, the Ganges runs to the [Bay of Bengal](#) through India, entering Bangladesh at Shibganj in the district of Chapai Nababganj. Just west of Shibganj, the distributary Bhagirathi emerges and flows southwards as the [Hooghly](#). After the point where the Bhagirathi branches off, the Ganges is officially referred to as the Padma and the river Bhagirathi uses the name of Ganga. Further downstream, in Goalando, the Padma is joined by the Jamuna, the main branch of the Brahmaputra (not to be confused with the river Yamuna which is a tributary of the Ganges in India). The resulting combination flows with the name Padma further east, to [Chandpur](#). Here, the widest river in Bangladesh, the [Meghna](#), joins the Padma, continuing as the Meghna almost in a straight line to the south, ending in the Bay of Bengal.

- Because of the free rider problem it is necessary to evolve mechanisms for sharing of costs in the provision of RPGs in an equitable manner. Multilateral institutions such as the United Nations (UN) agencies and ADB can play the role of an honest broker for evolving approaches and methods for arriving at equitable distribution of costs of providing RPGs at an optimal level in the subregion. Their involvement would also help to ensure open regionalism i.e. the provision of RPGs is consistent with related global protocols and frameworks.
- Multilateral institutions such as UN agencies and ADB working in the region should be interested in a study of RPGs. They can tap the resources available for RCI in their financing mechanisms and could help finance some of the cost of RPGs, particularly knowledge products at the subregional level. In the absence of multilateral initiatives these RPGs may be poorly funded or worse still, not be funded all. These products can be powerful instruments for strengthening cooperation in the subregion.

III. Scope of the Study - A Conceptual Framework for Prioritizing RPGs for the Study

15. The selection of climate change, clean energy, environment, control of communicable diseases, food security, furtherance of good governance, control of human and drug trafficking and coordinated natural disaster management as RPGs in the terms of reference (TORs) for this study captures those which are most appropriate for South Asia. These RPGs are also of high priority for the Asia Pacific region.

16. The justification for treating climate change as an RPG stems from the concept of environmental federalism. The literature on environmental federalism distinguishes between three categories of environmental impacts (i) those at the global level impacting on all the constituents equally (ii) those at the local level impacting only on the local constituents and (iii) those involving spillover effects between the constituents. Regional cooperation offers a practical way of mitigating the last category of adverse impacts since in this situation it is difficult to apply the standard Pigovian solution of imposing a pollution tax to internalize these negative externalities.¹⁵ The RPGs clean energy, environment, food security, and disaster management response could be viewed as sub themes under the overall rubric of the RPG climate change. Water management which is particularly important for the GBM and Indus basins could be included as part of the RPG relating to climate change. South Asia is extremely vulnerable to global warming and the selection of these RPGs for the study reflects the high priority that attaches to alleviating the impacts of global warming in South Asia. There is little debate that global warming constitutes one of the biggest threats to the continued economic development of South Asia.

17. The other selected RPGs are also of high priority for South Asia. For example, in view of its large aggregate population South Asia can suffer huge economic losses if communicable diseases are not controlled effectively. Communicable disease control could also be an important aspect of climate change mitigation. Good governance and control of human and drug trafficking are interlinked and are major concerns of all South Asian countries in improving public services.

¹⁵ See for e.g. Wallace E. Oates, A Reconsideration of Environmental Federalism, November 2001, Resources for the Future, <http://www.rff.org/Documents/RFF-DP-01-54.pdf>. Even though Oates' analysis of environmental federalism relates to the federal and state governments in the US, the concepts are equally valid for a region whose constituents are sovereign countries which do not collectively conform to the federalist structure of government.

18. From ADB-wide perspective, since South Asia is a subregion of the Asia Pacific region, the RPGs selected for the study should be relevant and of the same level of priority for the Asia and Pacific region as well. The RCIS has identified the following RPGs: clean air, environmental protection, control of communicable diseases, natural disaster response and dissemination of knowledge. This framework was basically adopted in the study prepared by ADB's Regional Sustainable Development Department (RSDD) in 2007 to assess the support provided by ADB for RPG activities in the Asia Pacific Region.¹⁶ The study expanded the list of RPGs to include action against drugs and human trafficking. The selection of the eight RPGs in the present study expands the list of RPGs further to include governance, food security and climate change.

19. All ADB RETAs are knowledge products. Since knowledge is a public good all RETAs could be regarded as RPGs. However the TORs of the present study have not included knowledge specifically as an RPG. To be consistent with the standard definition of public goods, and RCIS knowledge provision in the eight selected RPGs for SARD is implicitly an RPG (see para.148).

20. There is the question of uniformity of the definition of RPGs across all the operational departments of ADB. This could be dealt with simply by allowing different operational departments to identify their prioritized RPGs a priori so that under the project classification system approved RCI projects could be appropriately classified as belonging to the fourth pillar of RCIS.

21. Not all RPGs exhibit the same degree of publicness in terms of non-excludability and non-rivalry. By and large the RPGs included in the study are "pure" RPGs which satisfy both these criteria. However, there are several "impure" or quasi RPGs satisfying the criteria of publicness imperfectly, which may however be important for strengthening RCI. For example, regional transport and communications projects important for RCI are often designed as merit goods; they do not reflect consumer preferences but are impositions by the concerned governments for perceived public welfare.¹⁷ Provision of higher education through regional learning institutions which collect fees is a club good and does not satisfy the test of non-excludability; but it may be important for RCI. This list could be expanded further. To keep the study manageable and be consistent with the prioritization of RPGs Bank wide, the RPGs for this study are limited by and large to the "pure" RPGs listed in the TORs.¹⁸

22. In view of the free rider problem, RPGs are usually produced by governments and public sector institutions, including multilateral development banks (MDBs). Production of RPGs is typically a public sector activity. However private sector activities could also have spillover effects across the national border. For example, as RCI takes hold and private investments are "regionalized" based on considerations of profitability and cost advantage, the countries which

¹⁶ ADB. 2007. *Supporting Provision of Regional Public Goods in the Asia and Pacific Region*. Manila. The 2007 study and TORs of the present study treat clean energy as an RPG while clean air is included in the RCIS as an RPG. Clean air and clean energy may be viewed as equivalent RPGs, since clean air is obtained from clean energy. Strictly speaking clean air is a straight forward pure public good which satisfies the properties of publicness. Clean energy is more a club good (price mechanism could be used for exclusion) or a merit good (see footnote 17).

¹⁷ There is no underlying consumer preference or demand curve for merit goods which are provided on a top-down basis (Musgrave, 1988). Public goods can be subjected to demand analysis. Sandler (ibid) treats transport projects as club goods since tolls levied on roads can be used to exclude free riders.

¹⁸ The TORs require a study of management of regional infrastructure projects. This has been covered in the Report but not under the rubric of an RPG, to be consistent with the definition of RPGs in RCIS and the 2007 RSDD study.

receive these investments will enjoy externalities in terms of technology transfer and lower production costs.¹⁹ These are not strictly public goods even though they are provided cost free to the recipients. Regionalization is an important aspect of RCI but to maintain the focus on “pure” RPGs, externalities associated with regionalization are excluded from the study.

IV. A Review of RPG Provision in South Asia and Scope for Regional Cooperation

23. This section has two purposes:

- to provide the regional context for the concerned RPG and,
- to suggest areas where the RPG outputs could be enhanced through regional cooperation.

A. Global Warming and Climate Change

24. Climate change has been characterized as the greatest and widest ranging market failure ever seen.²⁰ Arguably, among the various regions of the world South Asia is the worst affected by global warming. The subregion is already facing the impacts of climate change and its future development will be under threat if global warming continues unabated. The major impacts are due to the melting of the Himalayan glaciers, rising of sea levels, loss of agricultural productivity and bio diversity, worsening water shortages, more intense natural disaster events, and increasing health hazards.

25. Global warming is associated with decreasing number and increasing intensity of typhoons in the Bay of Bengal, shortened monsoons and sharp variability in precipitation. As a consequence water security in the subregion will be degraded while the incidence of weather associated natural disasters will increase.

26. Based on the data of the Intergovernmental Panel on Climate Change (IPCC)²¹ United Nations Environment Program (UNEP), South Asian Association for Regional Cooperation (SAARC) and Development Alternatives (DA) have provided the following summary of the past trends in the rising of temperatures and changing rainfall patterns in South Asia.²²

¹⁹ Regionalization refers to the dispersion of private sector production activities to several participant countries under a regional framework of forward and backward linkages, resulting in Regional Production Networks (Moon and Roehrl, 2005).

²⁰ Stern Review. 2006. The Review was commissioned by the U.K. Chancellor of Exchequer as a contribution to assessing the evidence and building understanding of the economics of climate change.

²¹ IPCC is a scientific intergovernmental body tasked with evaluating the risk of climate change caused by human activity. The panel was established in 1988 by the World Meteorological Organization and UNEP. DA is a social enterprise dedicated to sustainable development.

²² UNEP, SAARC, and DA. 2009. *South Asia Environment Outlook 2009*.

Table 1. Trend in Changes in Average Temperature and Rainfall in South Asia

Country	Change in temperature	Impacts
Bangladesh	An increasing trend of about 1 ⁰ C in May and 0.5 ⁰ C in November during the 14 year period from 1985 to 1998	Decadal rain anomalies above long term averages since 1960s.
India	The updated 100 year linear trend for 1906-2005 is 0.74 ⁰ C	Increase in extreme rains in north-west during summer monsoon in recent decades, lower number of rainy days along the east coast.
Nepal	0.09 ⁰ C per year in Himalayas and 0.04 ⁰ C in Terai region, more in winter	No distinct long-term trends in precipitation records for 1948 to 1994
Pakistan	0.6 to 1.0 ⁰ C rise in mean temperature in coastal areas since early 1900s	No distinct long-term trends in precipitation records for 1948 to 1994
Sri Lanka	0.016 ⁰ C increase per year between 1961 to 90 over entire country, 2 ⁰ C increase per year in central highlands	Increase trend in February and decrease trend in June

Source: South Asia Environment Outlook 2009, UNEP, SAARC and DA 2009. (Table 14. p.46)

27. The variability of rainfall is increasing throughout the subregion with grave implications for the subregion's agriculture. For e.g. with a 4⁰C increase in the temperature and a 22% increase in evaporation, rice output in Bangladesh is projected to decline by at least 30 per cent. The output of wheat and potato, the other staple crops in the region could decline by 50% and 70% respectively.

28. Fisheries will also be affected by global warming. For example, tuna will migrate from the warmer to cooler habitats resulting in loss of livelihoods for tuna dependent fisher populations such as in the Maldives. Since 60% of the subregion's population is dependent on agriculture and 85% of the poor are from the rural areas, the good progress made in South Asia in the recent past to reduce poverty may come under threat due to climate change. Alongside the region may face slippages in achieving the millennium development goals (MDGs).

29. There is a severe danger of populations living downstream of glacial melts being subjected to major floods if there is no abatement of global warming. Tibetan Plateau glaciers are projected to vanish with a 3⁰C increase in temperature and no change in precipitation. This will affect all the countries through which rivers fed by snowmelt flow, viz. India, Pakistan, Nepal, Bhutan and Bangladesh. Gangotri, Yamunotri and Go Mukh glaciers which feed the Ganges and the Yamuna in India are already melting at an alarming pace. If the current warming rates persist, the Himalayan glaciers would shrink by 80% during 1995-2030. As glaciers melt, lakes are being formed at the foot of the Himalayan glaciers presenting the grave danger of outburst floods if these lakes would be unable to hold the snowmelt volume. The implications to populations who live downstream of these lakes in Nepal, India, Pakistan and Bhutan will be catastrophic.

30. Another major consequence of climate change is the rise in sea levels. Except the landlocked countries, viz. Nepal and Bhutan, all the other countries in the subregion will face the threat of rising sea levels. The island nations Maldives and Sri Lanka will be most severely affected. As rising seas displace coastal populations large scale migration from coastal areas to inland areas including trans-border migration will occur. As livelihoods get decimated in the

inundated areas there will be increased competition for resources and a degradation of social systems. Rising sea levels will also cause salt water intrusions into groundwater aquifers reducing fresh water supply for agriculture and drinking purposes. Water shortages would be further aggravated by increasing urbanization.

31. The implications of climate change for ecosystems and biodiversity could be no less devastating. One study estimates that a 2°C increase in average temperature will result in the disappearance of 15-40% of all species in the subregion.²³ The subregion's forests, wetlands and sea coasts will come under stress. In particular, mangroves forests (the habitat of the Royal Bengal Tiger) and coastal reefs will be adversely affected and livelihoods dependent on them will be degraded.

32. Scientific opinion strongly supports the premise that global warming is caused by greenhouse gases (GHG). The main GHGs are carbon dioxide (CO₂), water vapor, methane, nitrous oxide, and ozone. Water vapor and CO₂ together contribute the major part of the greenhouse effect. The output of these gases is a function of the quantity of energy used for household, commercial, and industrial purposes.

33. Production of GHG is not the only a problem related to the production of harmful gaseous substances resulting in global warming. The release of particulates into the air mostly due to the use of fossil fuel powered vehicles in urban transportation, burning of fuels by industries and the burning of wood is a threat to human life and health. Most of the cities in South Asia suffer from high concentrations of particulates which are considered to be at dangerous levels. The major health hazards associated with particulate pollution include debilitating respiratory diseases such as emphysema, premature delivery of babies and lung cancer. The yearly economic loss in India due to failing health caused by air pollution is estimated at \$1.3 billion.²⁴ A major achievement in the subregion is the sharp reduction in lead concentration in ambient air due to the adoption of use of lead free gasoline in most South Asian countries.

34. The trans-boundary phenomenon of the atmospheric brown cloud (ABC) or haze comprising aerosols which are light scattering and light absorbent particles caused by burning of fossil fuels and biomass burning (forest fires, slash and burn agriculture etc) poses a significant threat to the health of the populations in South Asian countries. Haze has become a common occurrence in winter even at high altitudes in South Asia.

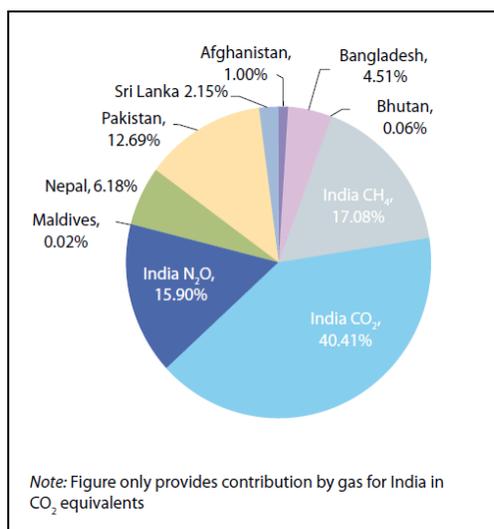
35. According to a Reuter's report China, US, EU, Russia and India in that order constitute the world's largest producers of GHG.²⁵ The GHG contributions of the countries in South Asia are shown in Figure 2.

²³ UNEP, SAARC, and DA. 2009. *ibid.*

²⁴ ADB. 2003. *Technical Assistance to South Asia Subregional Economic Cooperation Countries (SASEC) for Regional Air Quality Management.* Manila.

²⁵ Who are the world's biggest polluters? <http://www.reuters.com/news/pictures/slideshow?articleId=USRTXRKSI>

Figure 2. GHG Contribution by South Asia



Source: South Asia: Shared Views on Development and Climate Change, World Bank 2009.

36. India was by far the largest contributor of GHG in the subregion in 2000 (73.4%) reflecting the large size of its economy and its fast pace of economic development. However, it has been successful in reducing the energy intensity of its GDP from 0.3 kg of oil equivalent in 1992 to 0.19 kg in 2003, comparable with Germany and other fuel efficient countries.²⁶ Its per capita energy consumption is low given the large size of its population and the relatively low per capita income. As India maintains its high growth its use of energy will go up; its per capita CO₂ emission is projected to increase from 1.7 tons in 2005²⁷ to 2.1 tons in 2020 and to 3.5 tons in 2030.²⁸ India has voluntarily targeted a reduction in its energy intensity of GDP by 20-25% by 2020 over the 2005 level. The government has announced a National Action Plan on Climate Change in June 2008. The plan identifies eight priority missions running through 2017, viz.

- expanding the use of solar energy
- enhancing energy efficiency
- evolving sustainable habitat
- strengthening water security
- sustaining the Himalayan eco system
- greening India
- achieving sustainable agriculture and
- acquiring strategic knowledge of climate change.

The actions of the various state governments to accomplish these missions will be reported to the Prime Minister's Council on Climate Change which will periodically report the progress. The Council has also been tasked with the development of monitorable indicators to measure progress.

²⁶ The energy intensity of India's GDP is low; the recent high growth performance of India has been based on sectors with low energy intensity including ICT, biotechnology and R&D, rather than manufactures.

²⁷ The elasticity of GHG emissions with respect to per capita income worldwide is 1 (World Bank, *ibid*, p.53).

²⁸ Energy Bulletin, 2009.

37. The other countries in South Asia are not significant contributors to global emission of GHG but increasing urbanization, industrialization and energy use by these countries could rapidly add to the subregional emission load unless carefully managed. An RPG approach to the control of GHG in the subregion would be a helpful start.

38. Bhutan wishes to preserve its pristine environment and is virtually a zero contributor to greenhouse gas emissions. In fact its rich forests may serve as carbon sinks. However, Bhutan is vulnerable to climate change. Its rural livelihoods are predominantly based on subsistence agriculture which depends on the monsoons. 12% of its GDP is derived from export of hydro power to India. These sources of income could be degraded due to climate change. The vulnerability to climate change is exacerbated by the high population growth. The Royal government has announced the National Adaptation Program of Action to address the climate change challenge. The key projects in the program include preparation of a disaster management strategy, weather forecasting system, flood protection, rain harvesting and promotion of community based forest management.

39. Forests, particularly new growth forests are an important carbon sink and play a key role in absorbing atmospheric carbon in the carbon life cycle.²⁹ Deforestation will aggravate the adverse impact of climate change on soil quality. South Asia needs more green cover to prevent erosion from the increasing intensity of rainfall expected from climate change. The ongoing destruction of forests in South Asia is shown in Figure 3. The pace of deforestation in Nepal is the severest while very little forest is left in Afghanistan.³⁰

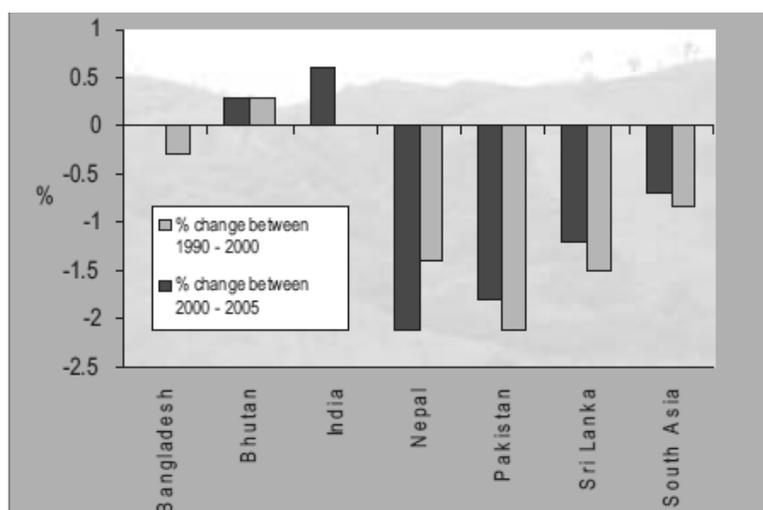
40. While the overall picture is dismal there are positive developments in forestry management in India and Bhutan. During 1990-2005 Bhutan's forest cover rose from 77.6 million ha to 79.2 million ha and India's from 63.9 million ha to 67.7 million ha. While this is a positive development the quality of the forest in terms of density of the tree cover is an issue.

41. In India the Thirteenth Finance Commission set up to review and recommend the allocation of resources between the states and the center has been asked "to manage ecology, environment and climate change consistent with sustainable development".³¹ Enhanced central mechanisms to preserve and protect India's forests are expected to be a part of the recommendations of the Commission which will become effective for the 5 year period commencing 1 April 2010.

²⁹ Carbon life cycle refers to the process by which carbon emissions from human activity and natural causes, is returned to the earth through carbon sinks such as forests and oceans. Trees, for e.g. use CO₂ during photo synthesis and release oxygen in the air after absorbing carbon.

³⁰ World Bank estimates that Afghanistan's forests comprise 1.3% of the total area(World Bank, Ibid).

³¹ Government of India, Ministry of Environment and Forest. 2009. *India State of Forest Report*. Delhi.

Figure 3. Annual Percentage Change in Forest Area

Source: UNEP. South Asia Environment Outlook, *ibid.* (Fig. 11, p.13)

42. It is clear that South Asia is extremely vulnerable to climate change but the exact dimensions of the problem, the different scenarios that have to be considered for assessing possible damage from climate change and the implications of global warming for the social, cultural and economic lives in South Asia are not clearly understood. For calibrating responses to the various adverse impacts of global warming and preparing strategies for countries to adapt to the changing environment, it is important to improve South Asia's knowledge base of the impact of global warming on the various aspects of the subregion's economic and social life through investing in thorough scientific studies. A major priority is developing a reliable data base for forecasting the impact of global warming on the subregion's economies and social systems. There is also scope for pursuing regional cooperation in reforestation and reducing industrial pollution by adopting regional environmental standards including for efficient energy use.

B. Clean Energy and Energy Efficiency

43. In the Asia Pacific region, South Asia is the second highest performing group of countries in terms of GDP growth, next only to East Asia.³² As economic development accelerates in South Asia the use of clean energy and efficient energy use will be important for mitigating pollution loads in the region.

44. Clean energy is largely a counter to air pollution caused by urbanization and industrial development; however the increasing use of rural energy in South Asia is adding a rural dimension to the clean energy issue. Almost all cities of South Asia are afflicted with rapidly deteriorating air quality due to

- increasing use of fossil fuels, in transportation, power generation, industrial applications and the use of wood and coal in cooking and lighting of households.
- inefficient use of energy which aggravates the problem by increasing the air pollution loads, and

³² ADB. 2009. *Asian Development Outlook 2009*. Manila. Figure 1.3.2, page 26.

- underpricing of energy which had resulted in its excessive use.

45. The main issue in clean energy provision is the management of the consumption of coal and petroleum which are major air pollutants unless carefully used with environmental safeguards. Table 2 shows the distribution of commercial energy consumption in South Asia among the different sources.

Table 2. Commercial Energy Consumption in South Asia

Country	Total (Quadrillion Btu)	Petroleum	Natural Gas	Coal	Nuclear	Hydro- electric	Other	Carbon Dioxide Emissions (Million metric tons of carbon)
Bangladesh	0.57	31%	66%	1%	0%	2%	0%	8.8
Bhutan	0.02	13%	0%	7%	0%	80%	0%	0.08
India	13.99	32%	7%	55%	2%	5%	0%	279.9
Maldives	0.01	100%	0%	0%	0%	0%	0%	0.2
Nepal	0.06	55%	0%	15%	0%	31%	1%	0.8
Pakistan	1.83	43%	41%	5%	1%	10%	0%	29.6
Sri Lanka	0.19	82%	0%	0%	0%	17%	0%	3.1
Total	16.67	34%	12%	46%	1%	6%	0.30%	322.5

Source: South Asia Environment Outlook, *ibid.* (Table 19., p. 82)

46. India dominates the South Asian subregion in terms of the use of commercial energy followed by Pakistan, Bangladesh and Sri Lanka. India's main source of energy is coal (55%) while for Bhutan, it is hydro energy (80%). Maldives depends on petroleum almost entirely for its commercial energy while Sri Lanka's dependence on petroleum is 80%. For Nepal, the major source of energy despite its vast hydro potential is petroleum (55%). South Asia's dependence on fossil fuels (coal and petroleum) is 80%; only 6% of its energy use is based on hydro resources. Renewable sources do not figure prominently in the use of commercial energy in South Asia.

47. Clean energy alternatives include development of clean coal, hydro power, wind, solar and tidal energy. Increasing efficiency of energy utilization through adoption of energy efficient technologies and demand management through economic pricing of energy will also contribute to lower GHG emissions.³³ Table 3 shows the contribution to GHG by the various sources of air pollution in the larger South Asian countries. The data show that a "one size fits all" approach to strategy for clean air in all the South Asian countries will not be appropriate; the strategy has to be country specific. For example, in India the focus should be on using clean energy technologies in electricity production. In Nepal and Sri Lanka the focus should be on reducing the production of methane from agriculture through more environment friendly technologies and practices.³⁴

³³ These technologies are at present costly and the energy produced by them needs to be subsidized. However, in the long run as economies of scale begin to operate in these technologies, the cost of producing energy will decline. (Stern Review. *ibid.*)

³⁴ The GHG intensity of agriculture in South Asia in general is relatively low due to low fertilizer use, poor soil quality and planting practices.

Table 3. GHG Emissions by Source in Larger South Asian Countries (in percentage)

DMC	Agriculture	Waste	Transport	Industry	Energy Production
India	22	7	6	4	61
Bangladesh	57	14	4		25
Nepal	95	5			
Sri Lanka	72	8		14	13
Pakistan	44	8	10	2	36

Source: World Bank, 2009 (figure 3.10)

48. India is the world's third largest producer of coal in the world behind US and China. Except for coal, it is not endowed with abundant energy resources. It has significant hydro potential but not sufficient to meet the growing energy demands of its fast paced development. It has planned a significant increase in its renewable energy capacity. Even under the most optimistic scenario of clean coal use, renewable energy development and transport reform, in the foreseeable future (2031) coal will be the dominant source of energy for India (Table 4). This is unavoidable from India's energy security point of view and electricity generation economics. If actual developments were to deviate from the most favorable scenario, the share of coal in the total energy use will increase.³⁵ Under the most optimistic scenario the GHG emission will rise to about 4 billion tons of CO₂ compared with 1 billion in 2000. Under the most pessimistic scenario, the CO₂ emissions will be about 5.5 billion tons.

49. There are two major implications of the scenario analysis. First, the major effort should be to use clean coal in power generation, which is the main consumer of coal. This will increase the cost of generation which if passed on to the consumers will also be a supportive demand side management policy to reduce GHG. Second, effort to develop clean energy alternatives must be accelerated.

Table 4. India: GHG Contributions of Energy Sources under Optimistic Scenario (in per cent)

Energy source	Percent contribution to energy use
Oil	22.8
Gas	9.8
Coal	41.1
Hydro	2.2
Nuclear	6.4
Renewable resources	5.7
Non Commercial Energy	12.0

Source: Planning Commission, India, 2007

50. India is fast tracking its renewable energy production program and has developed state of the art technical capacity to design and implement mini hydro plants, photo-voltaic cells to harness solar power, bio mass energy mainly to support rural energy applications, waste to energy technologies, and geo thermal and ocean energy projects. Various states in India are in the process of issuing instructions on the prices to be paid for renewable energy-based

³⁵ In the most pessimistic scenario, coal use could comprise as much as 65% of total energy consumed by 2031.

electricity generation and specifying mandatory quotas/shares for power from renewable energy in accordance with the provisions of the Central Electricity Act. Table 5 provides the major policy initiatives and legislation related to the provision of clean energy in India.

Table 5. Summary of Major Clean Energy Policies and Legislation in India

YEAR	TITLE	MAIN THRUST
Major Policies		
2006	Rural Electrification Policy	Establishes a national goal for universal access, assigns responsibilities for implementation, and creates new financing arrangements
2006	National Environment Policy	Provides guidance on air pollution reduction, climate change and GHG mitigation, and CDM; promotes clean technologies, environmental resource usage, and efficiency per unit of economic output.
2006	National Urban Transport Policy	Encourages integrated land use and transportation planning in cities.
2006	National Tariff Policy	Provides guidance on establishing power purchase tariffs by State Electricity Regulatory Commissions.
2006	Ministry of New and Renewable Energy (Draft) R&D Policy	Establishes resource requirements for the 11th Five-Year Plan.
2006	MNRE (Draft) Renewable Energy Policy	Identifies the strategies for increased deployment of grid-interactive RE technologies.
2005	National Electricity Policy	Provides guidelines for accelerated development of the power sector.
Major Acts		
2003	Central Electricity Act	Legislates a comprehensive reform and liberalization process for the power sector.
2001	Energy Conservation Act	Provides the legal framework and institutional arrangements for embarking on a national energy efficiency drive.
1986	Environment (Protection) Act	Provides broad objectives, goals, and guidance for environmental compliance.

Source: US Department of Commerce. 2008. *Clean Energy: An Exporter's Guide to India*

51. The rapid growth of urban transportation in India has been a major factor in increasing urban air pollution. The demand for transport increased by 1.9 percent per year during 2000-2005; total demand is projected to double by 2015 and more than quadruple by 2030.³⁶ The slow growth in demand for diesel to date may be due to improved fuel efficiency of new cars and trucks and switching to compressed natural gas in vehicles for public transportation in some major cities. The high fuel cost to per capita GDP ratio has also been a deterrent to the growth of vehicle trips.³⁷

52. The government is promoting several research, development, and demonstration projects including a demonstration project in battery-operated vehicles (BOVs). Under the program a central subsidy is provided for purchasing BOVs through renewable energy development agencies. In addition, fuel cell–battery hybrid vehicles with indigenously developed exchange membrane fuel cells for motor vehicles have undergone field performance evaluation. These efforts are expected to lead to the indigenous production and wider applications of fuel cell systems in the country. Various laboratories are developing technologies for production, storage, and transportation including hydrogen fuel, which some argue has the potential to

³⁶ US Department of Commerce. 2008. *Clean Energy An Exporter's Guide to India*.

³⁷ World Bank 2009, *ibid*.

replace fossil fuels as early as 2020. Motor vehicle manufacturers in India have the technical and management competence to transfer these research outcomes to production lines.

53. India is also researching the use of bio fuels such as ethanol from sugar cane and bio diesel from the jatropha plant which thrives in semi arid conditions. The economic viability of ethanol has been well established. However, the net impact on GHG production of growing sugar cane to produce ethanol to substitute for fossil fuels should be carefully assessed. The overall economics of growing jatropha and the implications of jatropha planting for the allocation of land and water for food purposes will also need to be evaluated more carefully before it is accepted as a viable substitute for fossil fuels.

54. India's energy efficiency enhancement measures include the industrial program for energy conservation; demand-side management; standards and labeling program; energy efficiency in buildings, commercial establishments etc.

55. Pakistan's major source of energy is natural gas. It is not a major user of coal in commercial energy supply- only 5% of its commercial energy requirements are met by coal. Pakistan has a total identified hydropower potential of more than 45,000 MW. However, the total installed capacity of hydropower generation in the country is only 6,595 MW. Pakistan has considerable potential for developing a broad range of renewable energy resources, principally wind, solar, biomass and small to medium-sized hydro plants. The vast potential of natural gas in Iran and the Central Asian countries can be tapped by Pakistan for substituting coal and for low carbon intensity energy generation.³⁸

56. Bangladesh aims to achieve 20% of its energy production from green sources by 2020 through exploiting wind power, biomass, biogas and hydro-electricity. These have been identified by the government as the country's major renewable energy sources. It is expanding the use of natural gas for domestic use with ADB assistance.³⁹ Replacement of inefficient light bulbs in the major cities with energy efficient incandescent light bulbs and rationalization of energy prices are among the major energy efficiency enhancing policies of the government.

57. In Sri Lanka, the share of thermal power in the power generation mix has increased dramatically from 1% in 1986 to 58% in 2008 as the entire demand growth has been served by oil-fired thermal generation. A major push on energy generation based on imported coal is underway. The increasing reliance on imported fossil fuels to meet the country's rising energy requirements poses a serious threat to the country's energy security as well as to the environment.

58. In Sri Lanka it is estimated that technical potential for 24,000 MW of renewable energy including biomass, wind and small hydropower plants exists. The government wishes to add at least 500 MW of renewable energy capacity by 2016 by tapping donor funds. In October 2007, the Government established the Sustainable Energy Authority, a focal agency mandated to develop and implement the national policy for renewable energy development, energy efficiency improvements, and energy conservation. It also introduced new technology-specific multi-tier tariffs to attract more private investment to nonconventional renewable energy projects. Although these initiatives have created an institutional framework to promote the development

³⁸ The ADB supported Turkmenistan-Afghanistan-Pakistan-India gas pipeline is an example. The proposed Iran-Pakistan-India natural gas pipeline is another such possibility.

³⁹ ADB. 2005. *Report and Recommendations of the President to the Board of Directors: Proposed Loan to Bangladesh for the Gas Transmission and Development Project*. Manila.

of renewable energy projects, lack of grid capacity remains a major technical bottleneck for clean energy development through private sector investment. In the area of energy efficiency Sri Lanka plans to promote compact fluorescent lamps (CFLs) and has introduced mandatory energy labeling in 2007; it plans to complete the program by 2010.

59. Nepal's energy policy emphasizes hydro power generation including for exports. Nepal has the potential to generate 43000 MW of hydro power; this can meet Nepal's energy requirements besides providing a surplus for export to energy deficient countries in the region provided appropriate mechanisms for cross border trading in power could be established and environmental and resettlement concerns associated with large storages addressed. ADB is assisting in improving the access of consumers to clean energy by strengthening the power transmission and distribution grid; propagation of energy efficient electric bulbs, rehabilitation of small scale hydro plants and use of solar and wind power in off grid areas.⁴⁰ Preventing electricity leakage is a key program for achieving energy efficiency.

60. Bhutan is also blessed with a huge potential for hydro power which can meet its requirements besides providing a surplus for export. The export of power from Bhutan to India is a well established practice. India has already given assistance to build three major hydro electric projects at Chukha, Kurichu and Tala. India is also helping in the construction of Punatsangchhu-1 project. The latest initiative is the ADB assisted 114-megawatt (MW) Dagachhu hydropower plant using Public-Private Partnership (PPP) modality for exporting surplus power to India.⁴¹ Under the project, the state-owned Druk Green Power Corp of Bhutan and Tata Power Company of India will set up a joint venture company for the Dagachhu Power project which will serve as a showcase for the PPP approach leading to increased foreign direct investments in energy development and a reduced state debt burden.⁴² The project is seeking a Clean Development Mechanism (CDM) status on a cross-border basis since it will help cut GHG. If approved the project operators will be entitled to carbon emission credits that can be sold for additional revenue. Bhutan and India have recently concluded agreements for preparing detailed project reports for four hydropower generation projects: Amochu (620 MW), Kuri Gongri (1800 MW), Chamkarchhu (670 MW) and Kholongchhu (486 MW). Besides, a 4,000-MW Sankosh project is also under negotiation.⁴³

61. In Maldives the principal source of energy is fossil fuels but scope exists for developing solar, wind and biomass based power. Its energy requirements are met almost entirely from import of fossil fuels; it has no endowments of conventional energy resources such as coal, oil and gas that it can utilize to meet its energy needs. Bulk of the fuel imports is diesel fuel oil which is mainly used for power generation both by the state power utility and about 1,000 other electricity generators in the outer islands. Diesel fuel is used in seawater desalination (for potable water production). Petroleum products are used in land transport (e.g., gasoline, high-speed diesel), including aviation (jet fuel), industries, and households (e.g., kerosene, LPG). Firewood is the main cooking fuel in most of the outer islands. Most urban households use LPG and kerosene for cooking. In the outer islands, the main source of energy for domestic purposes has been biomass. Increasingly, more outer island households are using kerosene and LPG for cooking instead of biomass materials. Renewable energy is used to power navigational lights

⁴⁰ ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Nepal for the Energy Access and Efficiency Improvement Project*. Manila.

⁴¹ ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Bhutan for Green Power Development Project*. Manila.

⁴² Cross border provision of clean energy in the private sector illustrates the Coase theorem that private negotiations will lead to mutually agreed pricing of externalities under certain conditions (Case and Fair).

⁴³ Reported in Economic Times 22 December 2009.

(marking the reefs), communication transceivers on fishing boats and for power supply at the remote installations on the national telecommunication network. These installations are not connected to the grid and are privately owned and operated. Solar energy is also used on a small scale for producing hot water for homes and in the tourism industry. The state-owned telecom company is using solar energy for meeting its entire power requirements. The Government is exploring the feasibility of using renewable energy capable of providing reliable electricity supply to the islands, while concurrently taking steps to make Maldives greener.

62. The runoff in Afghanistan's rivers could turn erratic due to climate change and it has to look for more reliable energy alternatives. Natural gas from neighboring Central Asian countries could provide a low carbon intensive commercial energy alternative as a long run solution.⁴⁴ Tapping renewable sources, including small hydro stations, solar energy and wind power is a feasible option given Afghanistan geoclimatic conditions. Technical cooperation with India in renewable energy could help develop domestic capacity in clean energy.

63. Developing workable models in cross border trading in power will help to boost the use of hydro power in the subregion and reduce the reliance on coal which is the major energy and air polluting source in the subregion. However, this strategy has to take into account environmental and resettlement implications of large scale reservoirs dependent on snowmelt from the Himalayan glaciers. The risk of Himalayan glaciers receding and drying up due to rapid progression of climate change will have to be taken into account while deciding to invest in hydro capacity. The South Asian countries could also share knowledge in renewable energy, clean coal use, energy conservation and successful approaches for increasing energy efficiency including economic pricing of energy.

C. Environment

64. Clean energy, energy efficiency and measures to combat global warming are the key RPGs in the area of environment. Apart from these RPGs other environmental RPGs important for South Asia are water management, hazardous waste disposal in urban areas and preservation of bio diversity.

65. Water security in the subregion is impacted by climate change. Economic growth accompanied by growing population has compounded the problem. For example, the per capita water availability in India has decreased to 1,869 m³ per year from 4,000 m³ in last two decades and farmers increasingly tap into groundwater resources. By 2025, the per capita water availability could decrease to less than 1,000 m³ indicating an extremely stressful situation.⁴⁵

66. The allocation of water among economic purposes in the subregion is overwhelmingly in favor of the agriculture sector. Almost 95% of the water supply is being used for agriculture (world average of 70%). A limited portion of the available water resources is used by the industrial and domestic sectors. The efficiency of water use in the subregion except for Sri Lanka is also not satisfactory. Except Sri Lanka, water productivity in terms of GDP produced from one cu m of water falls well below the world average.

⁴⁴ See footnote 38.

⁴⁵ UNEP. 2008. *Freshwater under Threat: South Asia*. Per capita availability less than 1700 m³ per year is considered stressful.

67. In view of the increasing scarcity of clean water, efficient management of water in the river basins shared by the South Asian countries Afghanistan, Pakistan, Nepal, Bangladesh, Bhutan and India should be viewed as an important RPG. The most important among these are the Ganges-Brahmaputra-Meghana (GBM), Indus and Helmand basins.

68. The GBM basin extends over 1.75 million km² stretching across Bangladesh (7.4 per cent), India (62.9 per cent), Nepal (8.0 per cent), Bhutan (2.6 per cent) and China (19.1 per cent).⁴⁶ The mean annual precipitation is 1,200 mm and 2,300 mm in the Ganges and Brahmaputra-Meghana river basins, respectively. The system drains about 1,150 billion m³ of water into the Bay of Bengal. The estimated basin population is approximately 535 million (75.8% in India; 20% in Bangladesh; 3.5% in Nepal; 0.2% in Bhutan; and 0.5% in China).

69. The basin is home to the largest concentration of poor in the world, with half of its population living in poverty. On the other hand, it is richly endowed with water resources, and has significant power potential of about 150,000 MW. With fertile alluvial lands in the plains (79.8 million ha) and a favorable climate, the majority of the population (about 10% of the global population) subsists on agriculture. With high population densities, India and Bangladesh withdraw groundwater for irrigation purposes, to meet growing agricultural demands. As a result, the groundwater levels have been sinking at an alarming rate in some parts of these countries. The GBM Basin countries are also increasing their industrial activities at a rapid rate. According to a UN report approximately 300-500 million tons of heavy metals, solvents, toxic sludge, and other wastes are discharged each year from industrial activities, most of which enter the freshwater sources. In the GBM Basin, 70% of the industrial wastes are dumped untreated into the rivers.⁴⁷

70. Among the South Asian countries, Bangladesh is located in the downstream and deltaic portion of a huge watershed. It is therefore vulnerable to flooding and loss of water quality due to upstream pollution. Because all major rivers flowing through Bangladesh originate outside its borders, any interventions in the upper riparian regions can have a significant impact on the water resources of the country.

71. The Indus basin is shared mainly by India and Pakistan.⁴⁸ The sharing of the waters comes under the Indus Waters Treaty signed between the two countries in 1960. The Treaty is being implemented relatively smoothly.⁴⁹ The quality of water in the basin is under stress due to pollution from agricultural activities (almost 96% of the water is used for agriculture) and comparative lack of sanitation facilities in the urban settlements along the Indus and its tributaries. There is no agreement between Afghanistan and Pakistan on the use of water resources of the Kabul River an important tributary of the Indus, which flows through Afghanistan before joining the Indus in Pakistan. Increasing water scarcity in Afghanistan due to global warming and economic development suggests that an early agreement on the use of the waters of the Kabul River would avert possible future tensions between the two countries.

72. The Helmand basin is located mostly in Afghanistan.⁵⁰ Therefore it does not present major regional implications.⁴⁶ However the rapid deforestation in the watershed and the possible

⁴⁶ The Brahmaputra and the Meghana are largely unexploited in the Indian portion of the basin as they flow through the hilly areas in northeastern India.

⁴⁷ UN World Water Development Report, 2006, cited in UNEP, Fresh Water, 2008.

⁴⁸ The river originates in China. Its main tributaries are the Jhelum, Chenab, Ravi, Beas and Sutlej.

⁴⁹ UNEP 2008, *ibid*.

⁵⁰ More than 85% of the basin is located in Afghanistan (UNEP, *ibid*).

⁴⁶ The other countries sharing basin are Iran and Pakistan.

increase in the river's salinity due to climate change, with implications for food security are causes for concern.

73. There will be increasing competition for water resources in the subregion due to economic development, growing populations and resource scarcity brought about by climate change. This may compel the downstream populations to adapt to the resulting water scarcity through more efficient use of water in agriculture, including water conservation and recycling. Global warming could make the water flow in the rivers unpredictable; the basins may be affected by severe flooding if the glacial lakes formed from the snowmelt in the Himalayas were to burst their banks.

74. Scientific hazardous waste management is essential for ensuring water safety. Careless disposal of hazardous wastes particularly in urban areas a common practice in the subregion's mega cities such as Mumbai and New Delhi, could add to GHG emissions, pollute rivers, drinking and ground water sources and ecologically fragile sea coasts. Kathmandu faces a similar challenge. Unsafe levels of arsenic in drinking water have been detected in India, Bangladesh, and Nepal. Beach tar is a common occurrence on the western sea coast of India. The uncollected garbage clogs drainage channels causing flooding even during modest rains. Mismanagement of hazardous wastes in towns and cities could partly explain the frequent outbreak of gastroenteritis and other water borne infections particularly in the slum areas which are usually devoid of even a semblance of a solid waste management system.

75. In Rajasthan, India, ADB is promoting organic waste composting in several urban local bodies. This will reduce the release of methane into the atmosphere at landfill sites, while providing business opportunities for the marketing and selling of compost. The project will also help avoid ground seepage of toxic and contaminated leachate.⁵¹ Institutionalizing door to door collection of garbage with segregation at source, recycling of inorganic wastes and composting of organic wastes comprise the bare bones of solid waste management in urban areas. The success of this strategy has been demonstrated in a small city in India facing a major problem of solid waste disposal.⁵²

76. Biodiversity in South Asia is under severe threat. South Asia is home to 12% of the world's fauna and 16% of its flora species.⁵³ Three land based biodiversity hotspots with rich biodiversity, cutting across several South Asian countries have been identified.⁵⁴ Vegetation remains only in about 10% of the original extent of more than 3.3 million ha of the hotspot areas. The extent of vegetation in the biodiversity hotspots has been declining due to over exploitation of natural resources resulting from high population growth and the impact of climate change.

77. The fragile state of biodiversity in South Asia may be seen in the high number of biodiversity resources both flora and fauna, either endangered or under the threat of extinction in South Asia (Table 6). The situation in India is particularly dire with almost 20% all animal species being under threat of extinction. As population continues to expand and global warming results in increased desertification and loss of wetlands and vegetation, the prospects of preserving the species under threat are fast receding.

⁵¹ ADB 2009, Climate Change, ADB Programs.

⁵² UNEP et al, *ibid*, Box 24.

⁵³ World Bank. *ibid*.

⁵⁴ UNEP et al, *ibid*. The three hotspots are: Category I, covering Western Ghats in India and highlands of southwest Sri Lanka; Category II covering Himalayan foothills of India, Bhutan and Nepal and Category III covering the Himalayan range stretching over Nepal, India, Bhutan and Pakistan (including all the world's mountain peaks above 8000 m).

**Table 6. No. of Species Facing Threat of Extinction in South Asia
(All Species)**

DMC	Critically Endangered	Endangered	Vulnerable
India	72	161	240
Sri Lanka	129	127	159
Bangladesh	10	28	51
Maldives	1	3	7
Nepal	4	18	52
Bhutan	3	12	32
Pakistan	8	16	50
Afghanistan	3	5	22

Source World Bank. *ibid.*

78. Apart from the biodiversity hotspots, the coral reefs of the subregion and the mangrove forests are also under stress due to intrusive human activity. Mangroves are receding due to deforestation and coral reefs are shrinking due to unsustainable fishing practices including destructive coral mining. 14% of the world's mangrove forests and 6% of its coral reefs are found in South Asia. In the aftermath of the 2004 tsunami the coral reefs of South Asia suffered extensive bleaching⁵⁵ and destruction. However the damage they suffered in the tsunami was much less compared with the destruction caused by human activity.⁵⁶ If global warming results in increasing ocean temperature in the coral reef areas by 3-4⁰ C the coral reefs will perish and will be lost forever.

79. The efficient use of water in the river basins such as the GBM basin can be better addressed through getting people and communities more involved in water management, increasing efficiency of water use in agriculture, more investment in water conservation, and preventing over exploitation of the rivers. A regional approach to dealing with flooding in the rivers and navigation will be more efficient than dealing with these only at the national level.⁵⁷ Preparing a database on the clean water and biodiversity resources of the region and assessing their vulnerability to global warming and pressures of urbanization and industrialization will be the first step in formulating a regional strategy to preserve these fragile resources. This analysis should include hazardous waste management issues.

80. Improved regional cooperation will be required to reduce the threat of extinction facing some species living in forest habitats spanning more than one country (e.g. the Sunderbans shared by India and Bangladesh for the Royal Bengal Tiger). Increased cooperation among maritime nations of South Asia will also be needed for preserving the rich biodiversity found in the subregion's marine ecology.

D. Food Security

81. Despite the ongoing diversification of the subregional economies agriculture is still the major provider of employment and an important source of income in South Asia. Poverty in the subregion is concentrated in the rural areas. Agriculture sustains rural livelihoods and has

⁵⁵ Coral bleaching occurs due to several causes including wave action, infection of bacteria and ocean acidification. If the causes of bleaching persist, corals will eventually die.

⁵⁶ UNEP. *et.al.* *ibid.*

⁵⁷ see para. 95.

provided the essential wage goods for industrial labor which has allowed development to proceed smoothly.

82. By and large the subregion achieved self sufficiency in the production of basic food grains viz. rice and wheat, by the 1990s. However population pressure has not subsided; falling death rates and slowly declining fertility rates are continuing to cause subregional population to expand steadily. Food production has to continuously increase to cope with the population increase. Projections by the Food and Agriculture Organization (FAO) show that growth in demand for food will outstrip the growth in production before 2015.⁵⁸

83. Moreover, economic development has also brought about household income increases and a spurt in the demand for superior and income elastic foods such as dairy products and meat. FAO projects that the per capita daily calorie intake in the subregion will increase from 2400 in 1997-1998 to 2700 by 2015 and further to 2900 by the turn of the century.⁵⁹ Agriculture in the subregion has to meet with this challenge as well.

84. The challenge of food security even though not emergent has not been entirely overcome. The coexistence of poverty and food self sufficiency in South Asia implies that the issue is more income security than food security. Income security can be brought about only through a strategy of economic development that targets employment generation and poverty reduction. While income security is the ultimate objective of development, supply side responses to address food security are also important. The 2007 crisis when the prices of food grains rose sharply in the subregion causing huge welfare losses, has highlighted the fragile condition of food security in the region.

85. Agriculture development in the subregion faces several obstacles. Agriculture is more a way of rural life and less a commercial activity. Subsistence and tenant farming dominate food production and cannot be easily reformed. By and large subsistence and tenant farmers are risk averse and are reluctant to accept innovations. Rural credit markets do not function well and agriculture is starved for credit, particularly for long term investments. Interlinked markets virtually bind the farmer to the landlord and the money lender. Because of these obstacles agriculture productivity is low in South Asia compared with the developed countries and East Asia. If these obstacles were to be addressed effectively agriculture development could be accelerated and food security strengthened.

86. Global warming poses a serious threat to agriculture and food security in the subregion. The already low productivity of agriculture in South Asia could decline further due to global warming. The main threats posed to subregional agriculture and food security by climate change include:

- uncertainty of monsoons
- variability of rainfall
- loss of soil fertility due to desertification and flooding, and
- loss of bio diversity affecting marine resources.⁶⁰

⁵⁸ UNEP et. al, ibid

⁵⁹ Cited in UNEP et. al. ibid

⁶⁰ Research also suggests that ceteris paribus higher atmospheric concentration of CO₂ will help rice production. However other negative factors associated with global warming would likely offset this partial benefit.

87. Food security has been traditionally regarded as a national PG. However food security concerns can be more efficiently addressed through a regional framework. For example, if food scarcity arises in a country due to monsoon failure, it will be efficient to import food from the neighboring countries. The traditional approach of building up huge inventories of food grains in every country to meet emergencies may not be an efficient solution to alleviating food security concerns since these stocks are held at a great cost and incur physical damage over time. The food shortages caused by the floods of 1998 in Bangladesh did not result in famine since food could be imported from neighboring India. If all the regional countries build up stocks to insure against the risk of crop failure the aggregated stock will likely exceed the quantity required to meet emergencies at any point in time. Hence it may be more efficient to address food security as a regional issue to avoid its over provisioning.⁶¹

88. During 2008 when food prices rose worldwide some food surplus countries including from South Asia imposed restrictions on food exports. An understanding of mutual help among the regional members on food exports to counter the crisis could have been a better expression of regional cooperation.

89. Some authors have recommended an RPG approach to food security such as the formation of a regional food bank to address food security concerns of the subregion.⁶² In fact the SAARC has already agreed to set up a food bank.⁶³ It will be useful if the food bank Board would publicize its activities through a dedicated website. The Board may also need capacity building to handle the international dimensions of the operation. It will be important that the operations of the food bank do not distort market prices through restricting supply. Creating a virtual food bank with rules and procedures for access during periods of distress is an option. This approach will not only help reduce market distortions but will also bring down costs of holding inventory.

90. An assessment of the threat to food security posed to the subregion due to global warming and the policies needed to address it at a subregional level is a priority activity in regional cooperation. Several studies have been prepared to model the impacts of global warming on agricultural production and productivity in the subregion. For example, a study for India suggests that a loss of nearly 50% in farm incomes could occur due to global warming.⁶⁴ The validity of such analyses should be verified and if found reasonable, appropriate coping strategies have to be formulated. This could be most appropriately accomplished as an RCI activity in the subregion.

⁶¹ see footnote 9.

⁶² M. Iqbal et al. 2009. *Food Security in South Asia: Strategies and Programmes for Regional Collaboration*. (Pakistan Institutes of Development Economics (PIDE) 2009).

⁶³ The SAARC Food Bank, which was proposed during the 15th Summit of the SAARC countries held in Colombo in July-August 2008 is a move to maintain a food stock to be used during emergencies. Agriculture Ministers of the SAARC countries met in New Delhi on 5th November 2008 for operationalizing the SAARC Food Bank. With an initial stock of 243,000 MT of food grains, the SAARC food bank will be setup with the contributions of the SAARC members. India will be the principal contributor with 153,000 MT of food grains followed by Pakistan and Bangladesh with 40,000 MT each, while Nepal and Sri Lanka will provide 4000 MT each. Afghanistan will provide 1420 MT, Maldives 200 MT and Bhutan 180 MT. Each country's share has been determined by the SAARC Food Bank Board, a body with one representative from each SAARC member country, based on production capacity, per capita consumption and availability. The Board would also work out the mode of pricing for distributing food grains during emergencies which would be a lower price than prevailing international prices. This framework illustrates the "weighted sum" approach to the provision of RPGs (see footnote 2).

⁶⁴ World Bank. *ibid.* Table 7.1.

91. Food security in the region could be improved through sharing of knowledge on farming technology and practices among the South Asian countries and reducing barriers among them in the trade for food grains.⁶⁵ The region could also benefit through liberalization of food prices which will benefit the farmers and motivate them to allocate more investment for agriculture. Market oriented agriculture development will commercialize farming and be an antidote to traditional, risk averse, low productivity subsistence farming.

E. Natural Disaster Response

92. South Asia is vulnerable to natural disasters including floods, drought, typhoons, and earthquakes. Much like food security, natural disaster response and management (NDR) has traditionally been regarded as a national PG. It assumes an RPG dimension when the natural disaster affects more than one country in the region. Floods in rivers shared by regional countries, earthquakes and typhoons which occur in a geographic region shared by more than one country and tsunamis along sea coasts common to more than one county in the region are examples.

93. The occurrence of natural disasters in South Asia will likely intensify with global warming. In particular, the rise of temperatures in the oceans will give rise to more intense typhoons. The subregion has witnessed recently severe changes in weather patterns attributable to climate change. Since 1970 there has been a fall in the number of typhoons affecting South Asia but their intensity has increased. The severity of flooding in the rivers has also increased even though there has been a reduction in overall precipitation.

94. Recent experience in the post disaster response to the 2004 tsunami suggests that responding to NDR on a regional level has many advantages. In particular,

- There is no need to duplicate the Early Warning System (EWS) for each individual country; there could be a single EWS covering all the vulnerable countries. For example, the recently introduced Natural Disaster Information System of India which includes EWS for tsunamis can be availed by Bangladesh, Sri Lanka and Maldives, under a regional cooperation frame work.⁶⁶
- The strategy and programs for post disaster relief are basically the same for all the affected countries; there could be economies in pooling and acquiring the materials required for post disaster relief operations.
- The knowledge and experience in managing post disaster relief could be shared by the affected countries in a regional frame work.

95. A coordinated strategic approach to NDR management among South Asian countries facing the possibility of common catastrophic events such as typhoons, earthquakes and floods in rivers shared by more than one country, could be considered as a high priority activity in subregional cooperation. The first step in such cooperation would be in the area of instituting EWS for flooding occurring in commonly shared rivers. For example, heavy rains in Nepal and India will cause flooding in Bangladesh with a lag of a few days. A regional approach to managing EWS for floods will help to convey the warning of impending flooding to vulnerable populations more effectively and thereby avoid loss of human lives and property in the downstream countries. The Mekong River Commission mechanism has helped to institute a

⁶⁵ PIDE 2009. http://www.pide.org.pk/index.php?option=com_content&task=view&id=119&Itemid=184

⁶⁶ UNEP et al. *ibid.* Box 13. This would be an example of the "best shot" approach to the provisioning of RPGs (footnote 2).

regional EWS for Mekong covering China, Thailand, Laos, Cambodia and Viet Nam.⁶⁷ A similar EWS of flood warning for GBM basin which has experienced frequent episodes of flooding in the past and faces the risk of more floods in the future due to climate change, could be considered. The sharing of EWS information on tsunamis is another possibility.

96. Another area of RPG enhancement is by pooling resources in the region to be used for disaster relief. Usually after the disaster strikes, international assistance is sought by the affected country to meet the expenditures of post disaster relief operations. Prior to seeking international relief the South Asian countries could first attempt to address the fiscal dimensions of the problem as a regional issue. There could be a common subregional facility patterned after the SAARC Development Fund⁶⁸ to which South Asian countries could contribute for addressing NDR. This facility could be availed during periods of distress caused by natural disaster response (NDR). Donors could contribute to this facility also. This mechanism would help avoid the current practice among South Asian countries and MDBs of diverting resources from development projects to NDR when a natural disaster strikes. A study of mechanisms available in other regions to coordinate NDR on a regional basis will be a helpful start.

F. Fighting Communicable Diseases

97. The burden of infectious diseases (IDs) on South Asia is heavy. The major IDs afflicting South Asian countries include HIV/AIDS, TB and malaria. Leprosy, kala-azar and elephantiasis are continuing to torment the poor and the socially marginalized populations.⁶⁹ The new and emerging IDs include the dengue, severe acute respiratory syndrome, avian influenza and flu caused by AH1N1 virus. The interplay between communicable diseases, poverty and malnutrition adversely affects socioeconomic development in the countries. Evidence also links the occurrence of cancer and some degenerative diseases to infectious causes.⁷⁰

98. Table 7 summarizes the incidence levels of the major IDs in South Asia as seen in the World Health Organization (WHO) fact sheets of these countries.⁷¹

⁶⁷ The Mekong River Commission (MRC) was formed on 5 April 1995 by an agreement between the governments of Cambodia, Lao PDR, Thailand and Viet Nam. The four countries signed The Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin and agreed on joint management of their shared water resources and development of the economic potential of the river. In 1996 China and Myanmar became Dialogue Partners of the MRC and the countries now work together within a cooperation framework. The MRC monitors the water level and the water flow in the river through a series of hydrological stations located on the river and its tributaries.

⁶⁸ see para. 127.

⁶⁹ Incidence of Kala Azar in Bangladesh is particularly severe with incidence level of 175/100000 population at risk, recorded in 2004.

⁷⁰ World Health Organization. 2007. *Department of Communicable Diseases: Profile and Vision*. India.

⁷¹ WHO Regional Office for Southeast Asia. <http://www.searo.who.int/index.htm>

Table 7. Incidence of IDs in South Asia (per 100000 population)

DMC	AIDS	Malaria	TB
Bangladesh	9(2004)	44(2004)	221(2005)
India	910(2005)	29(2005)	312(2005)
Maldives	None	Not available	0.26(2005)
Sri Lanka	<100(2005)	422(2002)	60(2004)
Bhutan	12(2005)	366(2004)	133(2004)
Nepal	500(2005)	25(2005)	280(2005)
Pakistan	960000(2008) ^a	104,454(2008) ^b	140(2008)
Afghanistan	<1000(2008) ^c	467123(2008) ^d	104(2008)

Note:

^a People living with HIV (PLHIV);

^b Total number of confirmed cases per annum;

^c Number of PLHIV cases;

^d Number of reported cases.

Source: WHO website SE Asia Department.

99. Resistance of some IDs to drugs is an emerging threat faced across all disease control programs. Some diseases such as malaria and STDs are becoming increasingly drug resistant putting more than 30% of the populations of these countries at risk and underscoring the urgent need to find cures and preventive medicines for these deadly diseases.⁷²

100. The approach adopted in fighting AIDS has been effective in slowing the progress of the disease. Over the past several years, both preventive care and treatment services for HIV have been scaled up in the affected countries in the subregion. Countries have adopted a public health approach to addressing the epidemic. The key steps of such an approach include defining the problem and risk factors, developing effective prevention and care strategies, scaling up these interventions, and monitoring and evaluating program impact.⁷³ This strategy could be replicated in fighting other IDs.

101. The chances of the trans-border migration of these IDs have increased with the growing globalization and RCI such as through trans-border migration of labor. This risk will become even greater with growing RCI in South Asia. Supported by WHO the South Asian countries are implementing national programs to address the various IDs. There are several success stories. For example, smallpox and guinea worm disease have been eradicated from the subregional countries.⁷⁴ All these programs have RPG implications to the extent that suppression of infection in one country of these IDs in the subregion will lessen the chances of their trans-border transmission.

102. Climate change could affect human health in diverse ways. For example, there could be an outbreak of malaria and dengue due to water stagnation caused by flooding. Water borne diseases such as gastroenteritis could also proliferate. Malnutrition due to loss of food security could be another outcome; when it occurs malnutrition tends to impact more severely on the health of vulnerable groups particularly the poor, women and children.

⁷² WHO. Profile and Vision, *ibid.*

⁷³ P. Shrikantiah, et. al., *Public Health Research Priorities for HIV/AIDS in South-East Asia*

⁷⁴ WHO, Diseases: Profile and Vision. *Ibid.*

103. Apart from the national programs, regional approaches could also be considered for fighting IDs. These include regionally financed R&D on these diseases and launching region-wide awareness-raising programs on the causes of the diseases and the preventive actions. The implications of climate change for human health in the subregion, particularly for the incidence of IDs should be studied carefully so that appropriate strategies and responses could be devised. In view of the technical nature of these initiatives collaboration with WHO would be needed to ensure the efficient and effective use of resources.⁷⁵

G. Fighting Drugs and Human Trafficking

104. Only India and Sri Lanka among the South Asian countries have signed the Protocol on Human Trafficking. However they are yet to ratify it.⁷⁶ Recognizing the gravity of the menace of human trafficking SAARC member countries signed a convention in 2002 at Kathmandu on preventing trafficking in women and children.⁷⁷ A regional task force was set up under the Convention to implement it. It will be useful if the activities of the task force would be publicized by the SAARC Secretariat in a dedicated website.

105. The UN Office on Drugs and Crimes (UNODC) states that South Asia is home to a vast number of victims of human trafficking. An important consequence has been an increase in the number of minor girls contracting HIV/AIDS.⁷⁸ The signature and ratification of the Protocol by all the South Asian countries would help forge a common understanding of what constitutes human trafficking and be the first substantive step in regional cooperation to fight the menace.

106. Illegal drug trafficking is also a lucrative trade in the region due to the high levels of unemployment and poverty in South Asia. India is situated between two hubs of global illegal drug production (the Golden Triangle and the Golden Crescent) and is particularly vulnerable as a transiting point in drug trafficking mostly to Europe. SAARC members signed a Convention on narcotic drugs and psychopathic substances in 1990. The Convention enjoins the members to take stringent measures against drug trafficking and to facilitate exchange of information and research on eradication of the illegal drug menace.

107. Winning the fight against narcotics in Afghanistan and Pakistan will be crucial for eradicating this menace worldwide. In 2006 Afghanistan produced 92% of the world's supply of opium, the key ingredient of heroin. Narcotics trade accounts for a third of the country's total economic activity.⁷⁹ Even though Pakistan was declared poppy free in 2000, a stricter

⁷⁵ A recent RETA for SERD "Regional Public Goods for Health: Combating Dengue in ASEAN" (Project No. 42190 dated April 2009) provides an example of WHO and ADB cooperation in the provision of health related RPGs.

⁷⁶ This was the situation as of 26 September 2008. The full title of the Protocol is Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children, supplementing the United Nations Convention against Transnational Organized Crime. The Protocol defines human trafficking as the recruitment, transportation, transfer, harboring or receipt of persons, by means of a threat or use of force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power or of a position of vulnerability or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purpose of exploitation. Exploitation includes sexual exploitation including prostitution, forced labor practices and the removal of organs of the trafficked persons.

⁷⁷ The cooperation envisages the wide ranging mutual legal assistance in respect of investigations, inquiries, trials or other proceedings including taking of evidence and obtaining of statements of persons; provision of information, documents and other records including criminal and judicial records; location of persons and objects including their identification; search and seizures; delivery of property including lending of exhibits; making detained persons and others available to give evidence or assist investigations; and service of documents including documents seeking attendance of persons.

⁷⁸ United Nations Office on Drugs and Crimes. 2007. *Annual Report*.

⁷⁹ UNODC, *ibid*

enforcement of the law against narcotics in Afghanistan could result in resumption of poppy cultivation in Pakistan. Pakistan is also a key transit hub for the narcotics produced in Afghanistan. While narcotics trade has global implications, the countries in the subregion are immediately affected by this activity. It is clearly a subregional “bad”.

108. Much of the national level response to drug and human trafficking, particularly in India has been to apprehend and prosecute human traffickers and drug offenders. To the extent that punishment of offenders discourages drug and human trafficking originating across the border, this national action will have RPG implications. However, in view of the enormous profits involved in the trade, it is doubtful whether this limited response has had the desired deterrent effect on the offenders. Law enforcement agencies given their multitude of functions also do not seem to attach priority to this problem.

109. A regional approach to enhance the fight against drug and human trafficking could include measures such as coordination of intelligence on drug producers and human traffickers in the region so that they could be kept under close surveillance.⁸⁰ Education of the population on the harmful effects of illegal drugs and the practices and methods of human traffickers to trap unsuspecting victims could also be efficiently organized as a regional initiative. A joint study by SAARC Secretariat with UNODC to identify the dimensions of the human and drug trafficking problem in the region and steps that should be taken to raise the awareness of law enforcement agencies to the growing menace will be a helpful start to tackle the problem systematically.

H. Governance

110. South Asian countries do not rank high in governance standards⁸¹ even though they have individually launched programs to fight corruption and improve public sector and corporate governance. This has discouraged foreign investment and delayed project implementation resulting in huge economic losses for the subregion.

111. There is not much available in literature on governance as an RPG. Reforms to simplify licensing procedures or building construction rules are basically examples of national PGs involving virtually zero cross border externalities. At a broader level, to the extent that better public sector governance in one country lessens corruption and improves public sector efficiency it will benefit all those who have to do business in that country such as domestic and international traders, investors, and tourists including from those countries coming under an RCI framework. Thus this national reform could be viewed as a global public good. However trade facilitation reforms (e.g. harmonization of customs rules and transit requirements) and simplification of business rules and processes to benefit traders and investors (e.g. unification of tax and investment codes) in a regional cooperation framework helps economic agents belonging to countries coming under that framework rather than outside of it and should therefore be viewed as an RPG.

112. Governance as an RPG is particularly important for addressing negative externalities which may arise from cross border movement of capital. While most of it is legitimate and should be encouraged there is a possibility that some of it could be by way of escaping surveillance and tax accountability in the parent country. The negative externalities could be

⁸⁰ Effective implementation of the recently signed bilateral agreement between Bangladesh and India on Combating Terrorism, organized crime and illicit drug trafficking (reported in Daily Star, Dhaka, dated 12 January 2010) would be a useful start for cooperation on fighting drugs in the subregion.

⁸¹ Transparency International Survey. 2008. *The Most and Least Corrupt Nations*.

<http://www.infoplease.com/world/statistics/2008-transparency-international-corruption-perceptions.html>

avoided by regional cooperation in financial surveillance and preventive action which is a governance-related RPG.

113. The areas in public sector governance emphasized by SAARC for regional cooperation include harmonization of regional standards to facilitate trade, mutual assistance in customs administration and avoidance of double taxation. These initiatives are strong RPGs and should be pursued.

114. Following the Latin American model⁸², efficiency in the provision of governance in South Asia can be improved through investing in regional institutions for training public sector staff in the South Asian countries and inculcating shared values in public administration and governance standards among the trainees. Anti money laundering could also be better addressed as a regional initiative through sharing of intelligence on capital movements.⁸³

115. Recent experience in managing the Global Economic Crisis and Food Crisis has highlighted the importance of avoiding beggar thy neighbor policies. Sharing information on macroeconomic policies among the South Asian countries can have important RPG implications since it will help improve macroeconomic management in the subregion.

116. For incorporating governance systematically in the RPG approach to RCI, the first step would be to prepare a study of governance as an RPG in South Asia. The study could be used to determine the governance-related priorities of SAARC members. Till a better understanding of governance as an RPG emerges, specific activities carried out to improve public administration in the subregion may be viewed as knowledge enhancing RPGs in the area of governance.

V. Cross Border Infrastructure Management Issues

117. The RCIS and the RSDD study on RPGs do not include cross border infrastructure as an RPG. However cross border infrastructure bestows important externalities by sparking regional economic development and is a key instrument for strengthening RCI. Under the RCIS Infrastructure is a separate pillar of the strategy.

118. Top down cross border infrastructure development is more in the nature of a merit good and does not strictly meet the criteria for an RPG in the same manner as the eight RPGs reviewed in Section IV. It could also be viewed as a club good since its availability is limited to those who acquire the equipment and are willing to pay to use the infrastructure facilities. For example, in energy provision the user must be willing to pay the tariff imposed on the users. Since user preferences can thus be revealed energy infrastructure is not strictly a public good.

119. There is no readily available information based on which the extent of knowledge of management of cross border infrastructure projects in South Asia can be assessed. Nevertheless the following conclusions based on experience elsewhere in the management of cross border infrastructure projects are relevant for South Asia:

⁸² R. Nogueira. 2002. *Chapter 13: Regional Public Goods, Governance and Capacity-Building*. Asian Economic Cooperation and Integration: Progress, Prospects, Challenges. Manila.

⁸³ The SAARC Conventions on mutual assistance in criminal matters signed in 2008 and on prevention of terrorism signed in 2004 could be used to foster cooperation on anti money laundering in South Asia.

- Regional and subregional projects are generally not economically attractive.⁸⁴ Their positive externalities cannot be internalized through an appropriate pricing mechanism; this leaves the development of such projects virtually in the domain of the fiscally constrained public sector. However, under appropriate conditions getting the private sector to invest in cross border infrastructure through PPP and incentives though difficult is doable (e.g. Bhutan's Dagachu hydro project and Nam Theun 2 Project⁸⁵).
- Coordination failures could result in underinvestment in infrastructure. For e.g. the power transmission networks are geared to handle increments of supply from near the established grid. The new power sources may be located far from the grid. Without coordinated investment in the development of the associated transmission infrastructure, new power sources will find it difficult to supply the grid at competitive prices. In practice investments in power generation development and transmission are handled by different corporate entities and unless they are coordinated power supply cannot be increased efficiently. Such considerations are particularly relevant for cross border infrastructure projects where coordination of investments would be even more difficult than for national projects. If a comprehensive and coordinated investment in cross border infrastructure projects linking the various hubs and nodes could be accomplished it will improve the profitability of the individual project segments⁸⁶;
- Regional Production Network development (regionalization) has tended to occur mostly along the sea coast.⁸⁷ It is possible to conceive infrastructure projects to connect interior and land-locked areas but these will involve huge present costs and lagged future benefits. The investors must be willing to await the future benefits - this will require long term commitments from them (e.g. East West Corridor Project of GMS).⁸⁸
- Cross border infrastructure projects also generally involve the engagement of local governments. A strong local government involvement in the management of cross border infrastructure projects is essential for their smooth implementation.⁸⁹ However the involvement of local governments adds one more layer to the complexity of their management.
- Economic corridor development is a comprehensive way of uplifting the economies of the areas served by the infrastructure. Mere linking of destinations with hard infrastructure may not by itself be sufficient to spark development in the project area. The physical infrastructure must be complemented by investments in social infrastructure and software such as trade and investment facilitation.
- An honest broker (such as ADB) can play a crucial role in forging commercial agreements in cross border energy provision (e.g. Nam Theun Project).

⁸⁴ H. Song. 2005. *Chapter 12: Increased Connectivity in Asia: Empirical Evidence and Issues*. Asian Economic Cooperation and Integration: Progress, Prospects, Challenges. Manila.

⁸⁵ ADB. 2005. *Report and Recommendation of the President to the Board of Directors. Proposed Loan to the Lao People's Democratic Republic for the Greater Mekong Subregion Nam Theun 2 Hydroelectric Project*. Manila.

⁸⁶ There is considerable literature on the existence of multiple equilibria due to coordination failure in the discussion on the "Big Push" theory of economic growth. When production decisions are coordinated a higher output (higher welfare) can be achieved (preferred equilibrium) compared with uncoordinated decisions resulting in lower outputs (see for e.g. K.Basu, Analytical Development Economics, 2000; Todaro and Smith, Economic Development, 2006).

⁸⁷ J. Moon and R.A. Roehrl. 2005. *Chapter 11: Infrastructure Networks to Extend Regional Production Networks to Inland Sites in Asia*. Asian Economic Cooperation and Integration: Progress, Prospects, Challenges. Manila.

⁸⁸ This would also explain the low internal rates of return for infrastructure projects.

⁸⁹ H. Song, *ibid*.

120. The main issues in cross border infrastructure management in Asia include the following

- while cross border development contributes to faster reduction of poverty and accelerates economic development in the region, the process of securing intergovernmental agreements (IGAs) on achieving interconnectivity and interoperability of the concerned national networks is difficult and time consuming.
- the costs of cross border infrastructure development can be huge and a major fiscal drain; It is easier to secure IGAs on two-way transmission systems in cross border infrastructure (telecom, transport) than in one way transmission systems (power, water).
- land-locked and interior countries in the interconnected networks tend to get marginalized in the market-driven regionalization process;⁹⁰ to overcome this constraint governments may have to intervene and provide incentives to support left behind areas.
- non physical aspects of cross border infrastructure development (e.g. telecom development and regulation policy, cross-border trade facilitation) are important for deriving full benefits from the physical investments in infrastructure.

121. Effective management of cross border infrastructure development would involve

- Accelerating IGAs by strengthening mechanisms for resolution of conflicts under a time bound program agreed by participating countries;
- Instituting special mechanisms for financing cross country infrastructure development activities; mechanisms such as the Asian Bond modality could be considered, as a starting point;
- Having special programs for dispersing the benefits of economic corridors to the hinterlands such as providing investment incentives to the private sector;
- Investing in national infrastructure projects which offer the maximum scope for interconnection of networks;
- Lessening transaction costs such as through development of infrastructure; countries which succeeded in reducing transaction costs have also tended to integrate faster⁹¹;
- Promoting specific economic corridors and logistics networks by putting in place high quality services in these;
- Achieving smooth cross border movement of people and goods through facilitation at borders;
- Creating specific nodes (such as border towns) for demonstration purposes;
- Providing incentives for developing regional production networks and SMEs particularly along the network pathways;
- Involving stakeholders, particularly private sector in planning and strategizing the cross border infrastructure projects , and
- Instituting EWS involving the stakeholders to identify and resolve emerging issues in cross border project management before they evolve as major bottlenecks.⁹²

122. There is not much literature available on extending standard economic analysis of projects to cross border projects. There are few actual project examples. If cross border projects are designed as merit goods as they often are, the standard cost benefit analysis will not apply

⁹⁰ J. Moon and R.A. Roehrl, *ibid.*

⁹¹ P. De. 2005. *Chapter 13: Effect of Transaction Costs on International Integration in the Asian Economic Community*. Asian Economic Cooperation and Integration: Progress, Prospects, Challenges. Manila.

⁹² Moon and Roehrl. *Ibid.*

to them. If the economic justification for the cross border investment should be established, at the very least the EIRR for the project should be computed and compared with the opportunity cost of capital. The “with” and “without” project scenarios in the benefitting countries will help establish the economic justification for the project. At a conceptual level, the main challenges in the exercise are valuing externalities from the project which are likely to be considerable and the distribution analysis of net benefits. The latter could provide a basis for sharing of costs between countries participating in the project and turn out to be contentious. Ramesh Adhikari and John Weiss describe the outline of a methodology for the economic analysis of cross border projects which provides a useful starting point for dealing with this complex issue.⁹³ The methodologies proposed by the authors may be applied in the actual economic analysis of the next cross border project to be financed by ADB.

VI. Best Practices in the Management of RPGs

123. In view of market failure in the provision of public goods including RPGs, their supply is normally undertaken by the public sector. The RPG approach requires strong “regionalism” i.e. involvement and support of governments concerned.⁹⁴ The provisioning of national PGs which could have regional impacts (e.g. clean energy, control of communicable diseases) is relatively straight forward. The financing of these activities will be from the concerned national budgets and the quantity of supply will be decided purely on national benefit and cost considerations. However, this approach does not ensure efficiency in resource allocation.⁹⁵ The challenge in the RPG approach is for the regional governments to take coordinated action on the provisioning of the RPG to secure its optimal provisioning.⁹⁶ This requires the following:

- The regional member countries are strongly committed to RCI as a way of enhancing regional development- this may involve the more developed members shouldering costs of initiatives higher than the less developed members in the grouping. The subregional or regional grouping of countries must be fully functional for moving forward with the RPG approach. Provided the above condition is met, multilateral institutions such as ADB can assist the regional country groups to identify the priority programs and projects for RCI including provision of RPGs.
- There is consensus in the group of countries regarding the prioritization of RPGs and their financing in the concerned national budgets. This in turn will require coordination of national budgets – a formidable challenge.

124. The key step is to forge an agreement among the participating governments that the selected RPG should be dealt with as a regional and not merely as a national issue. Once an agreement is reached it would be possible to consider a supra national arrangement to coordinate the provisioning of the RPG.

125. Technical cooperation on specific RPG-related subjects (e.g. clean energy and control of communicable diseases) among the participating countries could be considered as a preliminary step towards a more structured provisioning of the RPG for evolving regional objectives and approaches for the provisioning of the RPG.

⁹³ R. Adhikari et. al. 2002. *Chapter 3: Methodological Framework for Economic Analysis of Regional Projects*. Estevadeordal, A: Regional Public Goods from Theory to Practice.

⁹⁴ Regionalism in the RCI terminology is a public sector top-down activity in contrast with regionalization of production net works which is a market driven private sector activity (see Moon and Roehrl, *ibid*, for e.g.).

⁹⁵ This would imply the use of “summation” approach to the provision of the RPG (footnote 2).

⁹⁶ The aim is to foster RCI using the “best shot”, “better shot” or “weighted sum” approaches rather than the “weakest link” and “weaker link” approaches (footnote 2).

126. Apart from the national budgets, MDBs such as ADB can also finance RPGs. But, in view of the costs and difficulties in coordination, MDB initiatives generally focus on provision of software aspects of RPG and knowledge. The Inter American Development Bank instituted a fund in 2004 for non-reimbursable financing of regional projects which satisfy the twin criteria of publicness. These funds could be used for both technical assistance and physical investment. ADB's RCI Fund approved in 2007 supports TAs in the area of RCI. MDBs can also play the role of an honest broker in negotiating agreements among participating countries.

127. Another good practice in regionalism in RPGs is to institute funds to finance cross border development projects. The recently instituted SAARC Development Fund (SDF) will support cross border social, economic and infrastructure projects. In particular, the resources and facilities may be utilized for funding (i) projects involving all SAARC Member States; (ii) projects involving more than two but not all SAARC Member States; (iii) projects located in one or more SAARC Member States, of significant economic interest for three or more SAARC Member States;⁹⁷ and (iv) projects with significant focus on poverty alleviation in any SAARC Member State having thematic linkage with more than two SAARC Member States as part of a sub-regional project. SAARC member countries established the SDF in 2008 with a corpus of SDR 1 billion and a paid up capital of SDR 200 million to be contributed by all the SAARC member countries. The Fund may obtain technical and/or financial support from UN agencies, multilateral/regional funds and other non-regional partners as approved by the Fund's Governing Council. The early activation of the Fund will help solidify RCI in South Asia and show case a success case in financing cross border RPGs through regionalism.

128. While regionalism offers the best solution for the provision of RPGs due to the market failure and free rider issues, private sector investment and PPP approach have been found to be successful for the provision of clean energy in the subregion. A common criticism of RCI is that it is a top down activity and public sector driven with little private sector involvement. Getting the private sector involved in RPG provision through investment incentives and PPP should be considered where possible.

VII. RCIS and a Review of Approaches for Providing RPGs in SARD

129. ADB's new project classification system seems to view all RCI activity as RPGs by implicitly referring to the other three pillars of the RCIS as RPGs.⁹⁸ If this is accepted there is no difference between RCI and RPGs. It is operationally more meaningful to deal with "Other RPGs" included in the new classification system as the relevant RPGs for this study rather than deal with all RCI.⁹⁹

130. It is difficult to state what ADB's contribution has been in providing "Other RPGs" since the inception of RCIS. Much of the analysis of the 2007 RSDD report relates to pre RCIS data which does not capture the priority shown by ADB to RPGs since adopting the RCIS. The RSDD report's major conclusions included the following:

- During 1991-2006 ADB provided a total grant assistance of \$918 million for RPGs. NDR comprised 82.7% of the assistance and communicable disease control, 12.3%.

⁹⁷ This implies that SASEC (see footnote 21) projects could be financed by this Fund.

⁹⁸ ADB. 2008. Project Classification Review. *Staff Instructions*. Manila.

⁹⁹ In fact ADB should consider using the four pillars of RCIS to identify sub themes while classifying RETAs. The basic theme of all RETAs is RCI and the sub themes under them should logically be the four pillars, viz. Trade, Finance, Infrastructure and RPGs.

ADB financed 81.5% of the expenditure; the balance was provided by bilateral donors including JFPR, EU, Australia, etc.

- Loan financing of RPGs during 1991-2006 amounted to only \$132 million.
- ADB can play an important role in providing RPGs as a money bank, builder of capacity and honest broker.

131. South Asia does not figure in the forward looking program of RPGs for 2007-2009 described in the RSDD report. The review to follow focuses on the provision of the eight selected RPGs in the South Asian countries, after the approval of the RCIS in 2006.¹⁰⁰

132. No cross country or regional loans were approved during 2006-2009 nor proposed during 2010-2012 in SARD addressing the eight RPGs. Table 8 summarizes the RETAs approved in SARD during 2006-2009 and proposed for 2010-2012 for the provision of RPGs in South Asia (Appendix 1 for details). However the RETAs approved by SARD during 2006-2009 do not mention that the activity being supported by the RETA is an RPG despite clearly being one.¹⁰¹ Approval of RPG-related RETAs comprised 55% of the total RETA approvals by SARD during 2006-2009.

133. The key contributions of approved RETAs include:

- capacity building and human resource development in areas chosen by SAARC Secretariat.¹⁰²
- preparing regional energy sector dialogue and supporting capacity development of the Regional Energy Center of SAARC.
- preparing country strategies for managing for development results (MfDR) for poverty reduction and pilot testing some of the MfDR approaches in ADB projects.
- formulating innovative projects in key development areas as urban infrastructure, inclusive growth, etc.
- supporting networking of research institutes and think tanks in the subregion.
- analysis of food security issues, and
- study of urban water security and good governance in urban water management.

Most of the RETAs address capacity building and meet specific requests of the SAARC Secretariat.

¹⁰⁰ The review of RETAs is only for SARD. However, in the review of RPG related national loans and TAs, all SAARC countries have been covered.

¹⁰¹ The RETAs in Table 8 have been classified under project categories other than RPGs.

¹⁰² The Islamabad Declaration of 2004 following the twelfth summit of SAARC has identified key areas for cooperation, including poverty alleviation, information and communications, environment, culture, social issues, economic development and science technology. Capacity building in these areas could be considered as priorities by the SAARC Secretariat.

Table 8. SARD's RPG-related RETAs 2006-2009 and Proposed 2010-2012

RPG Classification	RETA Approvals (2006 – 2009)		RETA Proposals (2010-2012)	
	Number	Amount (\$ million)	Number	Amount (\$ million)
Action Against Climate Change	3	10,300	1	1,000
Clean Energy and Energy Efficiency	2	1,540	2	2,100
Environment	3	1,750	-	-
Food Security	1	1,500	-	-
Natural Disaster Response	-	-	-	-
Fighting Communicable Diseases	-	-	-	-
Action Against Drug and Human Trafficking	-	-	-	-
Governance	3	2,900	4	5,500

134. RPGs have not been included as an operational priority in the South Asia: Regional Cooperation Strategy and Program (RCSP) 2006-2008 Paper which predated the RCIS (approved in July 2006). This is also because a meaningful RPG program is dependent on strong regional cooperation being first established in the region. RCI is a work in progress in SARD.

135. The priorities for regional cooperation in SARD's RCSP 2006-2008 were improving connectivity, facilitating trade and investment, developing regional tourism, facilitating cooperation in energy, promoting private sector participation, supporting project and program based cooperation, support for ongoing subregional cooperation initiatives, promotion of inter-regional cooperation, and strengthening regional cooperation, mechanisms to deliver cooperation projects and coordination with other development partners. These priorities did not specifically address the fourth pillar of the RCIS – provision of RPGs. The draft completion report of the RCSP rates the strategy as “partly successful” and has proposed that concrete regional projects should be implemented for strengthening RCI. The RPG approach to RCI may be considered as an instrument for implementing this proposal.¹⁰³

136. An assessment of the current country partnership strategies and operations papers in SAARC countries shows that RPGs except for clean energy do not figure significantly in ADB's financial and technical assistance programs at the country level. Nevertheless there are some RPG implications of the country partnership strategies. The linkages between country partnership strategies and RPGs are summarized in Table 9.¹⁰⁴

¹⁰³ See para.9.

¹⁰⁴ Climate change and NDR initiatives are targeted primarily at the national level. However these initiatives could also have RPG implications. For e.g. one way to cope with rising sea levels in a country would be for the population to migrate which will impose costs on the countries in the subregion receiving the migrant population. If NDR is strengthened by flood mitigation measures by the country located upstream in a river, the downstream countries will benefit without paying for the investment upstream.

Table 9. RPG Elements in Country Partnership Strategies in SAARC

Country Partnership Strategy	RPG implications in country partnership strategy
India (2009-2012)	Clean and efficient energy, low carbon initiatives
Maldives (2007-2011)	Climate change initiatives, adjustment of NDR to accommodate climate change
Bhutan (2006-2011)	Hydro power development, energy trading
Sri Lanka(2009-2011)	Electricity demand management, other climate change initiatives
Nepal (2010-2012)	Climate change initiatives including NDR
Bangladesh (2006-2010)	Food security, climate change initiatives
Pakistan (2009-2013)	Clean energy initiatives, Indus system rehabilitation
Afghanistan (2009-2013)	Small sized hydro power, counter narcotics activities

137. The national TAs and loans approved in SARD during 2006-2009 with RPG elements are shown in Table 10 (Appendix 2 for details). There are no national loans or TAs in six RPG categories. Moreover, even in case of national loans and TAs with RPG implications viz. climate change and clean energy provision, these have not been explicitly recognized as RPGs in the concerned documentation.

Table 10. No. of Country-specific TAs and Loans/Grants with RPG Implications (2006-2009 approvals)

DMC		Action Against Climate Change	Clean Energy and Energy Efficiency	Environment	Food Security	Natural Disaster Response	Fighting Communicable Diseases	Fighting Action Against Drug and Human Governance
BAN	Loans	-	-	-	-	-	-	-
	TAs	-	2	-	-	-	-	-
BHU	Loans	-	4	-	-	-	-	-
	TAs	1	2	-	-	-	-	-
IND	Loans	-	12	-	-	-	-	-
	TAs	-	5	-	-	-	-	-
MLD	Loans	-	-	-	-	-	-	-
	TAs	-	-	-	-	-	-	-
NEP	Loans	-	3	-	-	-	-	-
	TAs	-	-	-	-	-	-	-
SRI	Loans	-	4	-	-	-	-	-
	TAs	1	1	-	-	-	-	-
AFG	Loans	-	2	-	-	-	-	-
	TAs	-	1	-	-	-	-	-
PAK	Loans	-	2	-	-	-	-	-
	TAs	-	1	-	-	-	-	-

VIII. Recommendations

138. National level activities in South Asian countries often impose significant cross border externalities. Several of these such as the use of fossil fuels for energy, deforestation and lax control of communicable diseases have negative impacts on the neighboring countries. Conversely national actions taken on clean energy and control of communicable diseases confer positive externalities on neighbors. If a suitable mechanism could be devised to

coordinate national activities involving cross border externalities, the impact of negative externalities could be mitigated and positive externalities maximized, allowing optimal provisioning of RPGs. This is the basic rationale for the RPG approach.

139. For the RPG approach to RCI to take root it is necessary that RCI be strengthened in the region. Repeated interactions among players help to reveal their preferences. This is a key step in the optimal provisioning of RPGs. A top priority is to further empower and institutionalize RCI platforms such as SAARC, SECSCA, SASEC and BIMSTEC¹⁰⁵ which are important for South Asia. ADB should explore more opportunities for strengthening RCI activities in these frameworks.

140. For ADB to move forward on RPGs it must be clearly recognized that RPGs are a high operational priority. ADB operations will focus only on the areas recognized as being of high operational priority. As a start, the provision of eight RPGs described in the TORs may be recognized as an operational priority in RCI for South Asia. This should be specifically incorporated on the forthcoming RCI strategy for SARD.

141. In view of the resource constraint and the need for balanced allocation of resources among the four pillars of the forthcoming RCI strategy of SARD, it will be necessary for SARD to prioritize the RPGs for operational purposes. Since climate change concerns have emerged as a top development priority in SAARC, environment related RPGs may be given the highest priority in allocating resources for RCI in SARD.¹⁰⁶ In particular,

- Climate change portends several far reaching changes in the economic and social life of South Asia and ADB can use RCI as an instrument to enhance the knowledge base on the subject and help the subregional countries prepare themselves for the adjustments needed. In particular climate change will impact on NDR and regional food security and slow the progress in achieving MDGs.
- Based on the findings of the studies on climate change it may be necessary to adjust mid course country partnership strategies of SARD's DMCs and the RCSP.

142. Advancing the RETA on climate change included in the 2011 program may be considered. Other follow on RETAs on climate change could be also considered to establish ADB as a solid partner in the dialogue on climate change and its consequences in the subregion.

143. Prioritization of RPGs should also be based on ADB's involvement at the national level in the provision of the concerned RPG. For example, since ADB has been involved in the provision of climate change initiatives, clean energy and NDR at the national level, it would be appropriate to view them as RPG priorities at the subregional level as well. Health is not an operational priority for ADB in Strategy 2020 and does not figure prominently in any of the country strategies in South Asia. Hence communicable disease control may not be viewed as an RPG priority except in the context of having to address it as a "public bad" due to climate change.¹⁰⁷

¹⁰⁵ RCI platforms in South Asia include South Asian Association for Regional Cooperation (SAARC); Subregional Economic Cooperation in South and Central Asia (SECSCA); South Asia Subregional Economic Cooperation (SASEC); and Bay of Bengal Initiative for Multisectoral, Technical and Economic Cooperation (BIMSTEC).

¹⁰⁶ For example, the Colombo Declaration of 15th SAARC Summit "expressed deep concern over global climate change and its impact on the lives and livelihoods in the region".

¹⁰⁷ see para 102.

144. It will be useful to assess the progress in implementing the various Conventions and agreements concluded between the participating countries under the SAARC framework. This exercise will help reveal the priorities of the SAARC members in the provision of RPGs and help to lay the foundation for a solid RPG approach to RCI in the subregion.

145. Future support for governance would benefit from a strategic approach to capacity building in governance. While ad hoc capacity building may be important to meet short term needs a preferred approach is to build a capacity building program based on a long term plan of capacity development to meet strategic development objectives. Capacity building initiatives should also match the RPG priorities identified for the future SARD RCSP Paper. For example, capacity building in clean energy provision including in such areas as formulating PPP in energy projects, negotiation of cross border power supply agreements and tariff determination in cross border energy projects are of priority. In climate change capacity building in designing and implementing coping strategies would need prioritization.

146. ADB should encourage immediate activation of the SDF. It should consider supporting cross border provision of RPGs using the Fund. For example, as a start it can co-finance such activities with the Fund. After establishing a good working relationship with the Fund, ADB can consider allocating untied contributions to the Fund. This will demonstrate ADB's confidence in the Fund modality and commitment to evolving South Asia as a success case in RCI.

147. ADB being the regional development bank is in the best position to coordinate the provision of RPGs in the region till the regional countries themselves are able to coordinate this activity effectively. This will mean ADB taking the initiative to coordinate the provision of the RPGs in the region in partnership with the concerned UN agencies (e.g. UNODC, UNEP, FAO, WHO)¹⁰⁸ and other donors which are also in the business of providing RPGs. These agencies are not generally familiar with the RPG approach and tend to view activities in their jurisdiction such as environment, communicable diseases control etc as global PGs. First, the RPG dimension of several of these activities could be dialogued with these agencies to establish firm partnership agreements with them on the provision of RPGs. The next step would be to dialogue with SAARC on ADB's role in coordinating the provision of specific RPGs

148. ADB can play an important role in providing RETAs to enhance the knowledge of South Asian countries in RPGs. The RPG related RETAs will invariably include a knowledge dimension.¹⁰⁹ Examples include studies on the impacts of global warming and urbanization on the region including its clean water resources, bio diversity and food security. Resources permitting, the dimensions of the human trafficking, money laundering and drug problem in the region and the pathways by which criminal activities occur also need to be studied. This study is best undertaken as a SAARC initiative in order to include Pakistan and Afghanistan whose inclusion would be indispensable for its usefulness to the subregion. These studies could establish the groundwork for the coordination of the provision of the relevant RPGs. Once sufficient information on select topics becomes available ADB can use them to spark RCI in agreed areas. This in turn can establish precedents for RCI in other areas till the RPG approach is mainstreamed into RCI.

149. One key RPG not specifically covered in the TORs is dissemination of economic information. Sharing of economic information by the constituent countries would be the first step

¹⁰⁸ It may be necessary to include in the dialogue bilateral donors as well if they are involved in providing assistance for the concerned RPG.

¹⁰⁹ This is an example of "joint products" in RPG provision (Sandler, *ibid*).

in promoting economic cooperation in the subregion. Economic cooperation has made a beginning in the subregion. In the aftermath of the recent global economic crisis, the central banks of India and Maldives agreed to set up of a foreign exchange facility which could be drawn down by Maldives if needed during financial distress. The next step would be to multilateralize this arrangement. ADB can help by coordinating dissemination of data and analysis of macroeconomic data needed for economic cooperation in the subregion. The work being carried out by ADB's Asia Regional Information Center for ASEAN could provide a precedent for this activity. Such information may be important for determining whether an external shock has imposed symmetrical or asymmetrical impacts on the subregional countries. Should the data reveal the former a coordinated response to the crisis by the countries would be a logical step.

150. Apart from addressing the regionalism aspects ADB should explore the possibilities of generating interest of the private sector in cross border clean energy projects. ADB can play an honest broker's role in forging PPPs and negotiating commercial agreements. The huge hydro potential of Nepal and Bhutan could be harnessed to meet the requirements of Bangladesh and India if suitable cross border project implementation arrangements could be evolved. The recent cooperation between Bhutan and India and the Nam Theun Project provide examples of success in this difficult but doable area. Other cross border clean energy projects where quick wins can be established need to be identified and pursued. ADB's guarantee mechanism provides powerful instruments for alleviating project and country risks inherent in cross border investments. ADB's RETA on Preparing the Energy Sector Dialogue which aims to identify at least 20 investment opportunities in regional energy development is an important initiative to support the development of energy trade in the subregion.¹¹⁰ The identified projects should be systematically followed through with ADB support.

¹¹⁰ ADB. 2006. *Technical Assistance for Preparing the Energy Sector Dialogue and South Asian Association for Regional Cooperation (SAARC) Energy Center Capacity Development Project into Regional Cooperation*. Manila.

**Table 1. ADB Regional Technical Assistance (RETA) Approvals with RPG Implications
in SARD Countries, 2006 - 2009 (US\$ '000)**

RPG Classification	RETA No.	Project Name	2006		2007		2008		2009	
			No.	Amt	No.	Amt	No.	Amt	No.	Amt
1 Action Against Climate Change	6337	Development Partnership for South Asia	1	8,500.00						
	7248	South Asia Strategic Framework for Aid for Trade Road Map						1	600.00	
	7423	Regional Economics of Climate Change in South Asia Part II: Adaptation and Impact Assessment						1	1,200.00	
2 Clean Energy and Energy Efficiency	6368	Preparing the Energy Sector Dialogue and SAARC Regional Energy Center Development Project	1	1,000.00						
		Solar Energy Development Component						1	540.00	
3 Environment	6361	Managing Hazardous Wastes	1	400.00						
	6523	Partnership for Good Governance and Knowledge on Urban Water Management								500.00
	7290	Achieving Urban Water Security for South Asia						1	850.00	
4 Food Security	6512	Promoting South Asian Regional Economic Cooperation II					1	1,500.00		
5 Natural Disaster Response										
6 Fighting Communicable Diseases										
7 Fighting Drugs & Human Trafficking										
8 Governance	6417	Supporting Network of Research Institutes and Think Tanks in South Asia - Phase II			1	1,200.00				
	6435	Preparing the Subregional Transport Logistics and Trade Facilitation Project			1	1,000.00				
	6472	Strategic Partnership for Policy Development and Action to Foster Regional Cooperation in South Asia			1	700.00				

**Table 2. ADB Regional Technical Assistance (RETA) Proposals with RPG Implications
in SARD Countries, 2010 - 2012 (US\$ '000)**

RPG Classification	RETA No.	Project Name	2010		2011		2012	
			No.	Amt	No.	Amt	No.	Amt
1	Action Against Climate Change	Supporting Climate Change Initiative in South Asia					1	1,000.00
2	Clean Energy and Energy Efficiency	Electricity Connectivity and Energy Efficiency Project II	1	600.00				
		Preparing Regional Energy Project			1	1,500.00		
3	Environment							
4	Food Security							
5	Natural Disaster Response							
6	Fighting Communicable Diseases							
7	Fighting Drugs & Human Trafficking							
8	Governance	Support for South Asia Regional Economic Cooperation	1	1,500.00				
		Subregional Trade Facilitation Infrastructure	1	1,000.00				
		Support for South Asia Regional Economic Cooperation II					1	1,500.00
		Promoting South Asian Regional Economic Cooperation III					1	1,500.00

**Table 1: ADB Loan/Grant, TAs Approvals with RPG Implications
for SAARC Countries, 2006-2009 (in US\$ million)**

RPG Classification	Loan/ Grant / TA Nos	Project Name	Country	2006		2007		2008		2009	
				No.	Amt	No.	Amt	No.	Amt	No.	Amt
1	Action Against Climate Change	7405	Capacity Building of the National Environment Commission in Climate Change	BHU							700.00
		7326	Strengthening Capacity for Climate Change Adaptation	SRI							700.00
2	Clean Energy and Energy Efficiency	7168	Development of Wind Energy	AFG			1	160.00			
		7060	Sustainable Energy Efficiency Development Program	PAK			1	600.00			
		4952	Gas Sector Development Program	BAN							
		7039	Jammu and Kashmir Clean Power Development Investment Program	IND							
		4992	Energy Efficiency Enhancement in the Power Generation Sector	IND							
		7157	Promotion of Clean Power Export Development	BHU			1	1,488.00			
		7099	Integrated Renewable Energy Development	IND			1	1,400.00			
		7096	Energy Efficiency Enhancement Project in Assam	IND			1	1,000.00			
		7242	Power System Efficiency Improvement	BAN						1	1,200.00
		7250	Study on Cross-Sectional Implications of Biofuel Production and Use	IND						1	500.00
		7363	Sustainable Power Sector Support II	SRI					1	800.00	
		G9128	Development of Mini Hydropower Plants in Badakshan and Banyan Provinces	AFG			1	12.00			

L2286	Renewable Energy Development Sector Investment Program (Tranche 1)	PAK	1	105.00	
L2287	Renewable Energy Development Sector Investment Program	PAK	1	10.00	
L2463	Green Power Development	BHU			51.00
L2464	Green Power Development	BHU			29.00
G0141	Green Power Development	BHU			1.00
G0119	Green Power Development	BHU			25.28
L2461	Himachal Pradesh Clean Energy Development Investment Program (Tranche 1)	IND			150.00
L2596	Himachal Pradesh Clean energy Development Investment Program (Tranche 2)	India			59.10
L 2587	Energy Access and Efficiency Improvement	Nepal			65.00
G0182	Energy Access and Efficiency Improvement	Nepal			300.00
G0183	Energy Access and Efficiency Improvement	Nepal			4.20
L2518	Clean Energy and Access Improvement	Sri Lanka			135.00
L2519	Clean Energy and Access Improvement	Sri Lanka			25.00
G0149	Clean Energy and Access Improvement (Second Approval for the Year)	Sri Lanka			2.00
G0149	Clean Energy and Access Improvement	Sri Lanka			2.20

- 3 Environment
- 4 Food Security
- 5 Natural Disaster Response
- 6 Fighting Communicable Diseases

- 7 Fighting Drugs & Human Trafficking
 - 8 Governance
-

**Table 2: ADB Loan/Grant, TAs Proposals with RPG Implications
for SAARC Countries, 2010-2012 (in US\$ million)**

RPG Classification	Loan/ Grant / TA Nos	Project Name	Country	No.	2010 Amt	No.	2011 Amt	No.	2012 Amt
1	Action Against Climate Change	Transport Sector Climate Change Adaptation							
		Addressing the Challenges of Climate Change	NEP				800.00		
2	Clean Energy and Energy Efficiency								
		Sustainable Clean Fuel Sector Development	BAN		500.00				
		Clean Power Generation Technology Transfer (Phase II)	IND		2,000.00				
		Uttarakhand Energy Efficiency	IND		800.00				
		State Renewable Energy Development	IND		1,200.00				
		State-level Support to Urban transport for Enhanced Energy Efficiency and Environmental Health	IND		700.00				
		Upper Seti Hydropower	NEP		500.00				
		Energy Efficiency Improvement II	BAN				500.00		
		Support for Climate Change and Energy Efficiency					500.00		
		Integrated Renewable Energy Development (II)	IND				500.00		
		Northeast Clean Energy Development	IND				1,000.00		
		Energy Efficiency Improvement	BAN		220.00				
		Pilot Wind Power Generation	BHU						
		Rural Renewable Energy Development (Subproject 1)	BHU		8.60				
		Assam Energy Efficiency Enhancement Project (Tranche 2)	IND		50.00				

Himachal Clean Power Development Investment Program (Tranche 3)	IND	98.40	
Integrated Renewable Energy Development I (Tranche 1)	IND	32.50	
State Renewable Energy Development (Tranche 1)	IND	49.20	
West Seti Hydropower Project	NEP	45.00	
Sustainable Power Sector Support II (Power Sector Gen.)	SRI	90.00	
Rural Renewable Energy Development (Subproject 2)	BHU		15.00
Assam Energy Efficiency Enhancement Project - Tranche 3	IND		30.80
Himachal Clean Power Development Investment Program - Tranche 4	IND		150.00
Integrated Renewable Energy Development - I - Tranche 2	IND		49.20
Jammu and Kashmir Clean Power Development Project - Tranche 1	IND		31.00
State Renewable Energy Development - Tranche 2	IND		30.80
Uttarakhand Power Sector - Tranche 5	IND		70.80
Sustainable Clean Fuel SDP	BAN		300.00
Electricity Connectivity and Energy Efficiency Project II	NEP		37.50
Assam Low Carbon Power Sector Development Project III	IND		300.00
Clean Coal Technology Transfer - APGENCO - Tranche 1 (Andhra Pradesh)	IND		50.00
Integrated Renewable Energy Development - II - Tranche 1	IND		50.00
Madhya Pradesh Energy Efficiency - Tranche 1	IND		50.00
Northeast Clean Energy Development	IND		300.00
Electricity Connectivity and Energy Efficiency Project II	NEP		30.00

		Upper Seti Hydropower	NEP		100.00
3	Environment	Assam Integrated Flood and River Erosion Risk Management (Tranche 1)		62.50	
		Brahmaputra River IFREMP (Formerly Integrated Flood and River Erosion Management Project- Arunachal Pradesh (Tranche 1)		20.00	
4	Food Security	Increasing Food Productivity and Supply	NEP		400.00
5	Natural Disaster Response				
6	Fighting Communicable Diseases				
7	Fighting Drugs & Human Trafficking				
8	Governance				

REFERENCES

Books and Publications

- Asian Development Bank. 2005. Asian Economic Cooperation and Integration: Progress, Prospects, Challenges. Manila.
- Asian Development Bank. 2009. Asian Development Outlook 2009. Manila.
- Asian Development Bank. 2008. Project Classification Review. Staff Instructions. Manila.
- Asian Development Bank. 2006. Regional Cooperation and Integration Strategy. Manila.
- Asian Development Bank. 2008. Strategy 2020. Manila.
- Asian Development Bank. 2007. Supporting Provision of Regional Public Goods in the Asia and Pacific Region. Manila.
- Basu K. 2000. Analytical Development Economics.
- Case K. and Fair R. 2006. Principles of Microeconomics. Sixth Edition.
- Energy Bulletin, Post Carbon Institute, September 2009.
- Estevadeordal A. et al. 2002. Regional Public Goods from Theory to Practice. Washington D.C.
- Government of India. 2006. Planning Commission. Integrated Energy Policy: Report of the Expert Committee
- Muhammad I. and Amjad R. Food Security in South Asia: Strategies and Programmes for Regional Collaboration. Pakistan Institute of Development Economics.
- Musgrave R. 1988. Part I, Chapter 7: Merit Goods. Bagchi A. Readings in Public Finance. Oxford.
- Stern N. Stern Review- The Economics of Climate Change, 2006.
- Todaro M. and Smith S. 2006. Economic Development. A Comprehensive Approach
Government of India. 2009. India State of Forest Report. Executive Summary
- United Nations Office on Drugs and Crime. 2007. Annual Report.
- United Nations Office on Drugs and Crime. 2008. Toolkit to Combat Trafficking in Persons. Global Programme Against Trafficking of Human Beings. New York.
- United Nations Environment Programme. 2008. Freshwater under Threat: South Asia.
- United Nations Environment Programme, South Asian Association for Regional Cooperation, and Development Alternatives. 2009. South Asia Environment Outlook. Kenya.

U.S. Department of Commerce. International Trade Relation. 2008. Clean Energy: An Exporter's Guide to India

World Bank. 2009. South Asia: Shared Views on Development and Climate Change. Washington D.C.

Technical Assistance Papers (TAs) and Report and Recommendations of the President (RRPs)

Asian Development Bank. 2003. Technical Assistance to South Asia Subregional Economic Cooperation (SASEC) Countries for Regional Air Quality Management. Manila.

Asian Development Bank. 2003. Technical Assistance for Preparing the Energy Sector Dialogues and South Asian Association for Regional Cooperation (SAARC) Energy Center Capacity Development Project into Regional Cooperation. Manila.

Asian Development Bank. 2005. Report and Recommendations of the President to the Board of Directors: Proposed Loan to Bangladesh for the Gas Transmission and Development Project. Manila.

Asian Development Bank. 2009. Report and Recommendation of the President to the Board of Directors: Proposed Loan to Nepal for Energy Access and Efficiency Improvement Project. Manila.

Asian Development Bank. 2008. Report and Recommendation of the President to the Board of Directors: Proposed Loan to Bhutan for Green Power Development Project. Manila.

Asian Development Bank. 2005. Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Lao People's Democratic Republic for the Greater Mekong Subregion Nam Theun 2 Hydroelectric Project. Manila.

Websites

Iqbal M. et al. 2009. Food Security in South Asia: Strategies and Programmes for Regional Collaboration. (Pakistan Institutes of Development Economics (PIDE). Iqbal M. et al. 2009. http://www.pide.org.pk/index.php?option=com_content&view=article&id=120:agricultural-production-markets-and-institutions-research-output-&catid=65:-agricultural-production-markets-and-institutions

Oates W. A Reconsideration of Environmental Federalism, November 2001, Resources for the Future, <http://www.rff.org/Documents/RFF-DP-01-54.pdf>.

Shrikantiah P. et. al., Public Health Research Priorities for HIV/AIDS in South-East Asia. http://www.searo.who.int/LinkFiles/Facts_and_Figures_HIV_research_priorities_SEA.pdf

Who are the World's Biggest Polluters. <http://www.reuters.com/news/pictures/slideshow?articleId=USRTXRKSI>

World Health Organization. 2007. Department of Communicable Diseases: Profile and Vision.
http://www.searo.who.int/EN/Section10_11520.htm

World Health Organization. Public Health Research Ppriorities for HIV/AIDS in South-East Asia
http://www.searo.who.int/LinkFiles/Facts_and_Figures_HIV_research_priorities_SEA.pdf