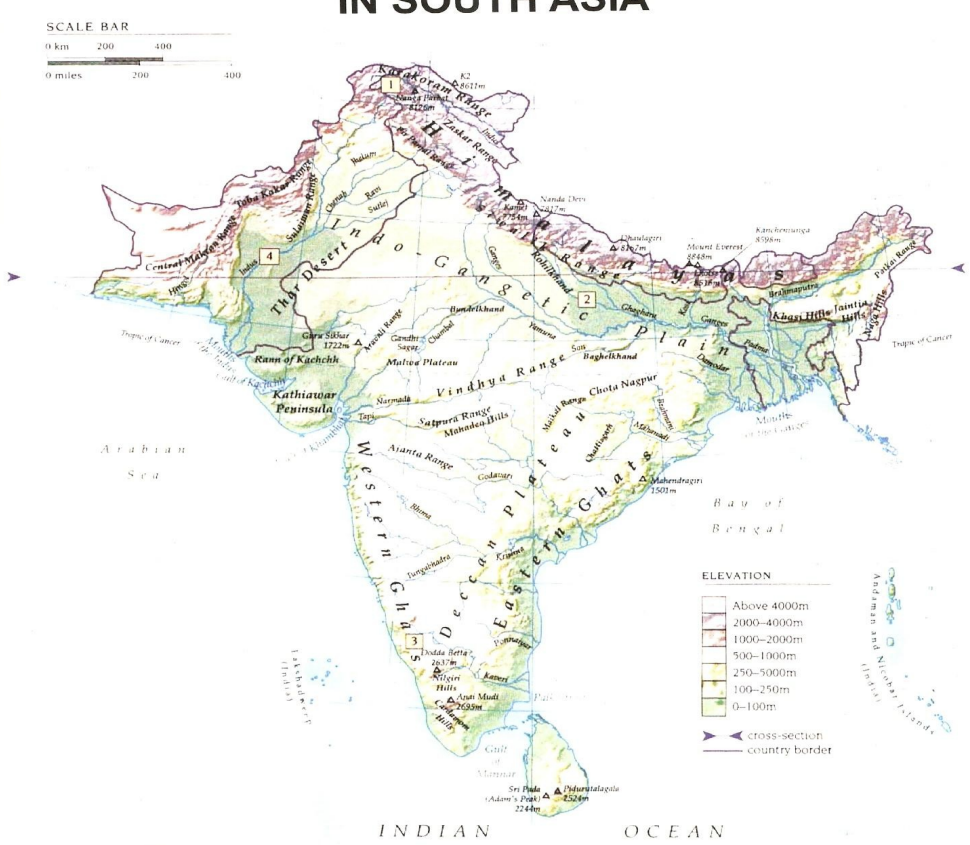
INTRODUCTION TO REFERENCE DOCUMENT FOR RIVER BASINS & RIVER BASIN ORGANISATIONS IN SOUTH ASIA



SOUTH ASIAN RIVER BASINS

MAY 2007

VOLUME - I

from Essential Reference World Atlas, Dorling Kindersley, Penguin, 1998

Volume I

RIVER BASINS – SOUTH ASIA

October 2007

REFERENCE DOCUMENT:

RIVER BASINS & RIVER BASIN ORGANISATIONS IN SOUTH ASIA

Commissioned by :-

ASIAN DEVELOPMENT BANK [ADB]

Prepared by :-

SOCIETY FOR PARTICIPATORY DEVELOPMENT, HYDERABAD, INDIA

In Collaboration with :-

CapNet South Asia, CapNet Bangladesh, CapNet Nepal, CapNet Pakistan & CapNet Sri Lanka

Coordinated by :-

GOMUKH ENVIRONMENTAL TRUST FOR SUSTAINABLE DEVELOPMENT, PUNE, INDIA

CapNet South Asia Regional Secretariat

31st August 2007

To,
Mr. Dennis Von Custodio
Basin Water Coordinator
RSID/RSDD
ADB
Philippines

Sub: Hard Copy of the Final Report
Ref: RETA 6219: Promoting Effective Water Management (Phase 4)

Dear Mr.Custodio,

With reference to the above, please find two hard copies of the final report as per the LOA on River Basin study. The soft copy has already been sent to you.

Please acknowledge receipt of the same.

Yours sincerely,

(Dr.Jasveen Jairath)
Regional Coordinator
CapNet South Asia

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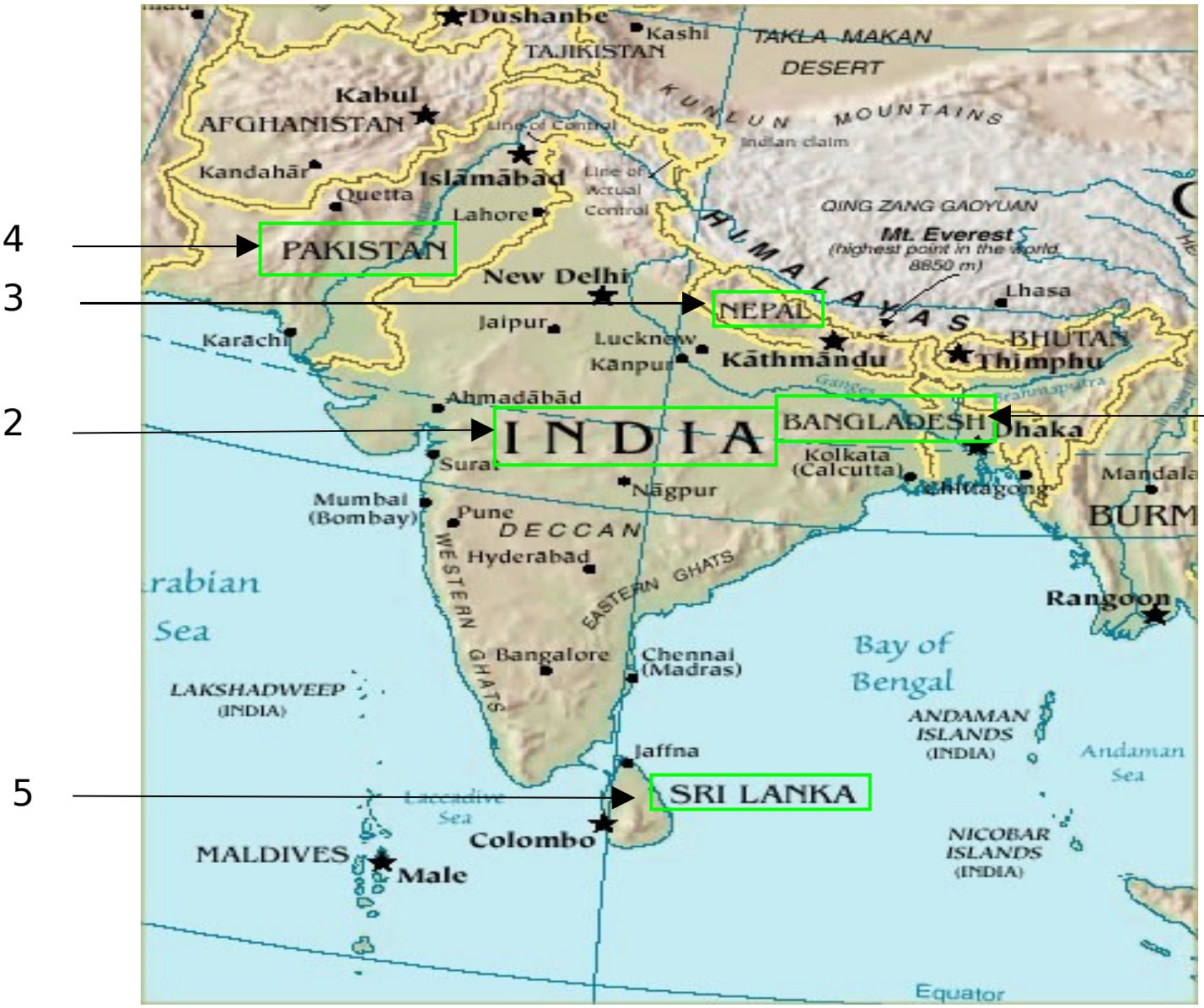
Abbreviations and Units of Measures:

ADB Asian Development Bank APWF Asia-Pacific Water Forum NARBO Network of Asian River Basin Organization GOI Government of India NGO Non Government Organization IRBM Integrated River Basin Management IWRM Integrated Water Resource Management WDI World Development Indicators WHO World Health Organization WSS Water supply and sanitation SPD Society for Participatory Development RBO River Basin Organizations RBA River Basin Agency CSO Civil Society Organisation CapNet Capacity building Network GFC Ganga Flood Commission GMIDC Godavari Marathwada Irrigation Development Corporation	GWDA Godavari Water Utilisation Authority KKDA The Karnataka Krishna basin Development Authority MKVDC Maharashtra Krishna Valley Development Corporation NVDA The Narmada Valley Development Authority NBA Narmada Bachao Andolan TB Tungabhadra Board UYWB Upper Yamuna Water Board GWP Global Water Partnership IWP India Water Partnership BWDA Bangladesh Water Development Board WARPO Water Resource Planning Organisation JRC Joint River Commission Bangladesh IWM Institute of Water Modeling BCAS Bangladesh Center For Advance Studies BUP Bangladesh Unnayian Parishad BELA Bangladesh Environmental Lawyers Association WAFED Water & Energy Users' Federation-Nepal O&M Operation and Maintenance
<u>Units of Measures</u> ha Hectares km Kilo meters kwh Kilo watt hours	 m Meters MCM Million Cubic Meters MW Mega Watts

VOLUME I

INTRODUCTION AND GUIDELINES
Table of Contents

1. Map of South Asia



1. BANGLADESH; 2. INDIA; 3. NEPAL; 4. PAKISTAN; 5. SRI LANKA

Note: River Basins in Maldives and Bhutan have not been studied.
Source : Atlas of India

2. ACKNOWLEDGEMENT

Society for Participatory Development (SPD) is thankful to the Asian Development Bank for giving the opportunity to participate in a project addressing imminent and priority concerns in South Asia namely- the need to mainstream Integrated River Basin Management approach through the mechanism of River Basin Organizations / Agencies.

We thank the Country CapNets of Bangladesh, Nepal, Pakistan and Sri Lanka for their support in acquiring, compiling and providing the data required for the project and bearing with us the pressures of time.

We also thank the staff of *Gomukh* Trust for their wholehearted assistance in co-ordinating the efforts of country CapNets on behalf of CapNet South Asia. Further, we also thank the voluntary organisations located in the different countries for providing information, documents and civil society perspective.

Finally, We thank Prof. Vijay Paranjpye for providing his expertise in the field of water management and technical support without which it would have been difficult to complete this project.

Dr.

Jasween Jairath

Society for Participatory Development

Hyderabad, India

3. PREFACE

The Reference Document on River Basins and River Basin Organizations in South Asia is a collective effort made by Cap-Net offices in South Asia: Bangladesh, Nepal, Pakistan, Sri Lanka, and Capnet South Asia Office located in Hyderabad, India. The task of collecting data was, however, carried out by the Project Co-ordination Cell located in Pune (India) on behalf of the project holder, Society for Participatory Development (SPD), Hyderabad. The study was initiated and financially supported by the Asian Development Bank (ADB).

The document contains data for a total of 38 river basins of South Asia from the countries namely three in Bangladesh , 19 in India, Five in Nepal, six in Pakistan and six in Sri Lanka are placed in Alphabetical order. ,In addition separate data has been provided for 17 relatively large tributaries in India. These tributaries however are not placed in an alphabetical order since they have been added to the data on the main river basin, e.g data on Beas, Chenab, Ravi and Jhelum, which are tributaries of Indus, have been placed immediately along with the data on Indus river basin.

All data contained in the river basin schedules A, B and C is from published documents or other sources that have been referred to and are listed at the end of each of the country volumes. All data is therefore of a ‘secondary’ nature and hence the veracity of the data lies with the original documents as quoted by respective country Cap-Net offices. The statements and opinions expressed in the introductory section however are the responsibility of the co ordinating cell based at Pune.

4. INTRODUCTION

In order to promote its broad programme for effective water- management policies and practices in developing countries, the Asian Development Bank (ADB) entered into collaboration with the Society for Participatory Development (SPD) for preparing a reference document on River Basins and River-Basin Organizations in South Asia in December 2006.The primary objective of this collaboration was to promote the RB and RBO agenda in South Asia, and as a first step, to prepare a Reference Document on “River Basin’s and River Basin Organization’s in order to provide the basis for planning for the future strategic interventions in the River Basin’s of this region, and to encourage similar exercises in other regions**.**

[a] Background:

South Asia has been in the midst of a water crisis since the early 1980’s. In 1990, the average annual availability of water was about 1800 cubic meters per person, and it fell to 1600 cubic meters by 2002*. This happened mainly because of the rising population densities on the one hand, and increasing levels of pollution on the other. The annual availability based on rainfall remained constant and finite. To make matters worse and more complex, the water development and management practices were sectoral, project-based, and large–dam-centric. And even this was practically at the exclusion of social and environmental issues, and the urban water and sanitation needs. By 2007 the annual water–availability has fallen to around 1100 cubic meters per person, – a situation that has been accepted as an 'extreme scarcity threshold'.

* Aquastat Information Systems on Water - Agriculture, FAO, 2002.
* * World Bank little Green Data Book.

To overcome this situation, the way water is currently managed in the South Asian countries, cannot continue without correction. “Business as Usual” has to give way to a holistic, integrated and socially equitable management of a river-basins as the most appropriate and systemic units of water management.

Currently, there are far too many inconsistencies and inequities in terms of access, distribution, pricing and metering of water supply. Most of these errors can be corrected by involving the participation of stakeholders in planning and implementation in a transparent manner, at the sub-basin and river basin levels.

Another major problem facing South Asian countries has been the issue of governance. The World Water Development Report 2002 of the United Nations, states that “The basic principles of effective governance include: participation by all stakeholders, transparency, equity, accountability, coherence, responsiveness, integration and ethical issues”. This is a tall order indeed. But if it is to be operationalised on ground, then the unit of operation will again have to be a river-basins.

Managing and developing a river basin requires an adequate and decentralized institutional framework. And by whatever name or description one may entitle it, the integrative elements mentioned above have to be implemented. In South-Asian countries such empowered institutional structures rarely exist today. At the national level, a semblance of policy and law framework does exist as an enabling instrument, but it is yet to be transformed into administrative practices.

Today, as the South Asian countries are striving to overcome the water-crisis, the legislators, researchers, planners, donors, financial agencies, non-governmental organizations and activists, all wish to know what the situation on field really is. They want to know what kind of geo-hydrological, socio-economic and environmental data is available for specific river basins. The global and academic discussions notwithstanding, they want to know if there are any organizations statutorily mandated (or otherwise) to perform the role of integrated management of river basins. And whether there are stakeholders sufficiently politicized and socially organized to participate in river basin planning, to decide on allocations and entitlements, negotiating for conflict-resolution, etc. They want

to know whether multi-stakeholder involvement really works in a largely uneducated and low-income situation? What level of civil-society organization is required to bring stakeholders and government agencies together on a common platform? For all these and many more difficult questions the available literature and documentation does not give satisfactory answers. Yet a beginning must be made towards the compilation of such data for each river basin.

The Reference Document at hand therefore attempts to take the first steps in this direction. It has tried to put together data on 55 river basins and sub-basins in South Asia. If it should appear to be too basic or simplistic, then that is all we have, and we need to build on it.

Although hydro-geologists and ecologists have known it for centuries, the integrity of river basins was not a part of the geo-political or techno economic discussions within the water sector till early 1980's. It was at an International Conference at Mar del Plata in 1977, and more seriously at the Dublin Conference (1992), and at the UNCED in Rio de Janeiro that the concept gained a global profile and became an important part of the sustainable development paradigm. Subsequently the World Water Conference at Marrakech (1997), The Hague (2000), Kyoto Shiga (2003) the UN: WSSD at Johannesburg and the fourth World Water Conference at Mexico have all reiterated the importance of integrated development and management of water resources.

The perception and viewpoints have been diverse, but all of them now seem to agree on the fundamentals. The ecologists and geographers mainly look at the natural elements of river basins and sub-ecosystems, while the engineers, economists and government departments think of integration in terms of development sectors like urban water-supply, hydro-power, irrigation, industrial use, flood control, water-transport and fisheries, etc. Besides, social activists and the civil society organizations perceive it from the equity view point and dwell on community participation and negotiations as an important way of integrating the

rights and risks of all stakeholders into the Integrated River Basin Management (IRBM) approach.

While there is a fair degree of consensus about the importance of the IRBM approach in theoretical terms, the South Asian experience during the last fifteen years suggests that in terms of application it has been obstructed by perverse political interests, departmental rivalries and bottlenecks, bureaucratic obduracy and corruption. These structural flaws have been instrumental in preventing the changes in attitude that are required to achieve a holistic result. Despite all that, the South Asian countries have been moving forward.

The IRBM concept is difficult to define, but for the sake of convenience we may start with a working definition adapted from the South African experience which runs as follows, "*IRBM is simultaneously a philosophy, a process and an implementation strategy to achieve a sustainable balance between the utilization and protection of environmental resources in a catchment, and to grow a sustainable society through stakeholder, community and government partnerships in a management process*".

An important lesson has been learnt during the last two decades. Namely, that it is not sufficient to make disconnected infrastructure investments in water-resource development like dams and canals, water-purification plants or distribution systems through the conventional 'departmental' or 'sectoral' approach. Simultaneously, there has been a growing recognition that these assets need to be created through a holistic and integrated approach that aims at putting in place the required policy and legal framework. Similarly comprehensive institutional framework that is capable of connecting and synergising a package of investments through a transparent decision making process is necessary for optimizing the outcomes.

A review of the impact of infrastructure investments in the water sector made by national and international institutions has revealed a rather dismal picture as regards equity issues, especially in the provision of the basic needs of water and sanitation services to the poorest population segments in the South-Asian countries. The ADB's 'Water-Policy' document (June 2003) recognizes the fact that, *"the urban poor in densely populated towns and cities in Bangladesh, India and Nepal queue at public standposts to access limited quantities of water of dubious quality. In India, the poor are often confined to consumption levels below 15 liters per capita per day compared with the better offs, who consume up to 300lts per capita per day".* This suggests that a lot of new investment still needs to be made to overcome the basic scarcity and access issues. Yet, blindly pumping in more money for dams and barrages will not be appropriate. The World Commission on Dams and the Water Resources Sector Strategy of the World Bank, for example, have arrived at the conclusion that, " more of the same" approach has serious hazards and pitfalls that need to be avoided. For example, it states that,

> *"Instead of assessing different options for meeting human needs, and for considering structural and non-structural alternatives, there has been a rush to build major infrastructure. In too many instances the result was the construction of dams and other infrastructure that were economically, socially and environmentally destructive. Second, such infrastructure projects often paid little attention to a particular and vital group of poor people, namely those who had to be resettled and those who were adversely affected by the changes in river flows. Too often the idea was that these sacrifices were "for the greater good" and therefore justified. Some of the World Bank's greatest and most publicized failures in the past involved the financing of the dams that were planned and built without sufficient attention to social and environmental consequences*".

Another important realization among the water-sector researchers has been that, unlike the industrial and trade sectors, the water sector has to be embedded within a hydro-ecological system represented by natural river basins or watersheds, in order to be sustainable. And further, that such sustainability can be realized only when investment and management plans are prepared through an iterative process of direct stakeholders participation. This envisages the building-up of a knowledge base, a structure of stakeholder platforms, information - dissemination procedures. In addition, formal and informal negotiations, and arbitration mechanisms that ensure equitable access and entitlements to water are necessary. Moreover, to increase the efficiency within the water-use system as a whole, cross cutting threads such as rational pricing and economic valuation need to be woven into the process, so that water resource development and management remains sustainable in financial and economic terms as well.

In view of the situation described above, and in order to shift to a new, holistic and integrated paradigm, the water sector managers and the civil society in South Asian countries need to acquire a fresh understanding of the riverine system. And in order to operationalise this strategy, individual “river basins” will have to be studied and understood as live and dynamic systems and not just as carriers of so many billion cubic meters of water, The sub-basins and the mini / micro watersheds will have to be understood as interconnected and interdependent parts of River Basins as a whole. Consequently, a river basin will need to be treated as the most appropriate unit of planning, multi-stakeholder participation, integrated development and eco-systemic management. Similarly empowered “River Basin Organizations”(RBO), which, can sustain the activities in the long run, will need to be established as the “appropriate institutional mechanism” for each basin, as against of the conventional departments based on the administrative boundaries.

The Reference Document at hand is therefore an attempt at answering questions like: What is the status of our knowledge regarding the River Basins in South Asia? And, what is the status of River Basin Organizations in South Asia? Or, what could be done in order to, either establish new RBO's where they don't exist. Or in case they do, in what way can their capacities be built-up or enhanced for performing a wider range of functions required for integrated river basin development and management? It is quite obvious that the list of lessons learnt can be is quite formidable, and that correcting past mistakes is going to be challenging and time consuming.

[b] Process:

The output of this collaboration, namely the Reference Document therefore includes a discussion regarding the criteria/definition for identifying River Basins and River Basin Organisation's in South Asia and information relevant to Bangladesh, India, Nepal, Pakistan and Sri Lanka; which would lead to the strengthening of water-partnerships in the region, especially the Network of Asian River Basin Organization (NARBO), set up under ADB's Water Partnership Programme.

The work was to be completed in 6 months, commencing on 1st of December 2006 and ending 31st May 2007.The schedule and description of activities to be carried out mainly consisted of identifying resource persons (Country CapNet offices) and setting up of E-correspondence mechanism with such resource persons. The activities included collection of data, consolidation and collation of inputs, circulation of the preliminary draft for comments, incorporation of feedback by ADB to finalize the database.

Due to the time consuming and dispersed nature of River Basins across 5 countries and the large number of river basins and major tributaries, socio-political situations, linguistic differences, differences in idiom and terminology, SPD requested for three more months extension for putting the documents

together, i.e. by end of August 2007- which was accepted by the ADB. However even though the formal assignment was completed by end of August, a lot of gaps were being filled in while the data kept trickling in from the different country-Capnet offices. Given the time and resources available for this study, nature of data collected, this reference document could be called a rapid-assessment, which should be followed up with a more detailed effort at the earliest. The data given here, however, does reflect a realistic situation in South Asia today.

5. SCOPE OF THE STUDY

Terms Of Reference / Objectives:

The major terms of reference for the study on River Basins and River Basin Organisation's in South Asia were as follows:

1. In order to promote its broad programme for effective water- management policies and practices in developing countries, the Asian Development Bank (ADB) entered into collaboration with the Society for Participatory Development (SPD) for preparing a reference document on River Basins and River-Basin Organizations in South Asia in December 2006.

2. The primary objective of this collaboration was to promote the RB and RBO agenda in South Asia, and as a first step, to prepare a Reference Document on "River Basin's and River Basin Organization's in order to provide the basis for planning for the future strategic interventions in the River Basin's of this region, and to encourage similar exercises in other regions.

3. The output of this collaboration, namely the Reference Document would include a discussion regarding the criteria/definition for identifying River Basins and River Basin Organisation's in South Asia and information relevant to Bangladesh, India, Nepal, Pakistan and Sri Lanka; which would lead to the strengthening of water-partnerships in the region, especially the Network of Asian River Basin Organization (NARBO), set up under ADB's Water Partnership Programme.

4. The work was to be completed in 6 months, commencing on 1st of December 2006 and ending 31st May 2007.

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Note :

Due to the time consuming and dispersed nature of River Basins across 5 countries and the large number of river basins and major tributaries, socio-political situations, linguistic differences, differences in idiom and terminology, SPD requested for three more months extension for putting the documents together, i.e. by end of August 2007- which was accepted by the ADB. However even though the formal assignment was completed by end of August, a lot of gaps were being filled in while the data kept trickling in from the different country-Capnet offices.

6. METHODOLOGY ADOPTED

[a] Definitions:

1. River Basin :

For the purpose of this document a working definition of a River Basin has been adopted as follows:

A river basin has been accepted as the entire geographical area drained by a river and its tributaries ; an area characterized by all run off being conveyed to the same outlet; including that of its catchment, drainage, watershed, detention, retention and storage. (e.g. The Krishna river basin) This study therefore focuses on issues logically associated with the above aspects.

2. Major Tributaries :

A major river basin have several tributaries which drain discrete catchments then flow in to the principal river, at the point of confluence. In view of the large number of tributaries the study has taken in to consideration tributaries which cover a significant portion of the river basin, is know by an independent name, may have independent development and management master plan. (e.g. The Bhima River Basin). However a strict area definition has not been adopted for this document since it would be not practical to do so.

Note – Although the river Ganga and Brahmaputra technically form one complete river basin, since they have a confluence before discharging water in to the Bay of Bengal, they have dealt with as independent river basins in view of their enormous size and magnitude.

3. River Basin Organization / Agencies: (RBO/RBA)

At the commencement of our study we had conceptually described an RBO as *"**a statutorily incorporated body which has the competence and authority for preparing a Master Plan (MP) for the development of a river basin or part thereof, implementing and operationalising the key elements***

of the MP in a prioritized and phased manner; requisition finances from government budgets or from the open market sources; setting up an administrative and institutional mechanism for incorporating the water needs of all categories of water-users, and deciding on equitable and fair water-entitlements; setting up a mechanism for enabling stakeholders to meaningfully participate in the planning, decision making and implementation process; setting up a procedure for information dissemination, discussion, negotiation, arbitration and conflict resolution; setting up a system for water pricing; en-route appraisal and evaluation; and finally liaising and interacting with the government authorities on matters of policy and law."

It was further clarified to and agreed that an RBO may be :

[I] "***an entity which, though not statutorily not incorporated, accepts the principles of eco-systemic integration in general, and the Dublin principles in particular, and takes a holistic river basin approach while dealing with water related issues, shall also be considered to be an RBO.(For Example: Council for Equitable Water Rights, a Forum of 6 NGOs, working in the Chikotra sub river basin, within the Krishna River Basin.)"*** Or,

[II] an ***organisation*** that may be performing all or some of these functions and yet may or may not be statutorily incorporated, or may be operating as a voluntary agency. (For *Example:* Baitarni Initiative in Orissa) Also, that

[III] in some cases of river basins, the government ministry or a department of the government, may have been given the task of performing some (or all) of the RBO –function.(*For Example:* Mahaweli Ganga Development Authority in Sri Lanka)

[b] Framing the questionnaire for data collection:

It was envisaged by the coordinating cell in India that all participants need to work on a common platform, and hence an **MS Excel** format was developed. Its contents and expected inputs were then explained to Country representatives [CapNets]. Subsequently, this was followed by interaction over e-mail, telephone and by personal meetings with the participants.

Due to the geographical spread of the study, about 70 percent of the data could be assembled by the participants in the first six months, ie, until 31st May 2007. SPD therefore requested for an extension until 31st August to complete the study. A draft questionnaire was prepared at the Pune office which constituted the major elements of the river basin for which data was to be collected. Further, these elements were divided in three parts namely. Schedule A, which consisted of physical data, Schedule B, which dealt with statutorily constituted River basin Organisations and Schedule C which dealt with voluntarily formed River Basin Organisations. This questionnaire was then circulated amongst the CapNet members and civil society organizations for their suggestions and comments. After receiving the feed back, the questionnaire was appropriately modified and recirculated.

Finalized schedules dealt with the following:

- Schedule A consists of the factual data about the geographical, hydrological, water management aspects. This provides an overall view of the location and extent of the river basin and the quantity and quality of water available, as well as its utilization at present. The latter part of the schedule indicates the efforts in hand to regulate the available water and the plans already announced by the government for construction of new dams, water bodies, and effluent treatment plants. The National and State regulations for the management of water and the key issues, affecting the stakeholders have also been listed in this schedule.

•Schedule B is an attempt to ascertain and identify the statutory and semi governmental agencies established for addressing issues related to the management of the river basin through participation of stakeholders. Where transboundary issues like quantities, flow schedules, erection of barrages, and distribution are encountered, this schedule lists the names and roles of different agencies, and wherever possible the address and contacts of the key officials.

•Schedule C refers to the initiatives taken by the Civil Society Organizations at the basin level, to promote the participation, of the local communities, urban local bodies for achieving the objectives of river basin management.

These schedules have been used for all river basins to maintain uniformity, and to enable comparisons. In case of several basins, information related to schedule B and C is not available and hence it is not included. This compilation also contains other information, tables, etc, which have been added as supplementary data, and which therefore differs from basin to basin.

All data in this volume has been derived or quoted from secondary sources, and the coordinating cell does not take responsibility about the veracity of the data. Similarly the boundaries of basins, countries may not necessarily coincide with those authorized by government agencies of the respective countries, since the boundaries may be under dispute.

The database as now presented provides a reasonable assessment for a comparative study of river basins in terms of their compliance with the IRBM principals.

[C] List of River Basins & Tributaries

DISTRIBUTION OF DATA-SHEETS – INDIAN RIVER BASINS			
	River Basin having its own datasheet		***Major Tributaries having Independent datasheets***
	INDIA		
1	Bhadar		
2	Bramhaputra		
3	Budhabalanga		
4	Cauvery		
5	Ganga		
		1	Gomti
		2	Ghagara
		3	Yamuna
6	Godavari		
		4	Indravati
		5	Kolab
		6	Manjara
		7	Purna
		8	Vainganga
		9	Wardha
7	Gundalkama		
8	Indus	10	Beas
		11	Chenab
		12	Ravi
		13	Zelum / Jhelum
9	Krishna	14	Bhima
		15	Tungabhadra
10	Mahanadi	16	Baitarni
		17	Brahmani
11	Mahi		
12	Nagavali		
13	Narmada		
14	Pennar		
15	Rushikulya		
16	Sabarmati		
17	Subarnarekha		
18	Tapi		
19	Vamsadhara		
	River Basins - 19		**Tributaries - 17**

List of River Basins & Tributaries

DISTRIBUTION OF DATA-SHEETS – BANGLADESH, NEPAL, PAKISTAN& SRI LANKA RIVER BASINS		
BANGLADESH		
1	Jamuna	Known as Bramhaputra in India.
2	Meghana	Known as Barak in India
3	Padma	Known as Yamuna in India
NEPAL		
4	Kosi	
5	Gandhaki	Also known as Narayani in Nepal
6	Mahakali	
7	Karnali	
8	Mai-Khola	
PAKISTAN		
9	Chenab	
10	Indus	
11	Jhelum	
12	Kabul	
13	Ravi	
14	Sutluj	
SRI LANKA		
15	Mahaweli	
16	Kala Oya	
17	Deduru Oya	Also known as Aruvi Ari in Sri Lanka
18	Attangalu Oya	
19	Menik Ganga	

[D] THIS COVERS RBO's AND CSO's

No.	Name of the River Basin	Name of the RBO	Name of the CSO
INDIAN RIVER BASINS :			
1	BHIMA		Upper Bhima Water Partnership, Gomukh Environmental Trust,
2	BRAMHAPUTRA	Brahmaputra Board 1980	
3	GANGA	Ganga Flood Commission	
4	GODAVARI	Godavari Irrigation Development Corporation	Jalaspandana Society
5	GODAVARI	Godavari Water Utilisation Authority	
6	GODAVARI	Marathwada Irrigation Development Corporation	
7	GODAVARI	Vidarbha Irrigation Development Corporation	
8	KRISHNA	Maharashtra Krishna Valley Development Corporation	
9	KRISHNA	The Karnataka Krishna basin Development Authority	
10	NARMADA	The Narmada Valley Development Authority	Friends of Narmada
11	TAPI	Tapi Irrigation Development Corporation	
12	TUNGABHADRA	Tungabhadra Board	STRIVER
13	YAMUNA	Upper Yamuna Water Board	*'Yamuna Jiye Abhiyan'*

No.	Name of the River Basin	Name of the RBO	Name of the CSO
BANGLADESH RIVER BASINS			
1		Bangladesh Water Development Board (Bwdb)	Institute Of Water Modeling (Iwm)
2		Water Resource Planning Organization (Warpo)	Bangladesh Paribesh Andolan
3		Water Resource Planning Organization (Warpo)	Bangladesh Environmental Lawyers Association (Bela)
4		Joint River Commission, Bangladesh (Jrc)	IUCN - The World Conservation Union
5			Bangladesh Center For Advanced Studies (BCAS)
6			Bangladesh Unnayian Parishad (Bup)
NEPAL			
1		No. RBOs	Himalayan & Peninsular Hydro - Ecological Network (HYPHEN)
2			Water & Energy Users' Federation-Nepal (WAFED)
3			WAFED, Makawanpur Branch
4			WAFED, Idimardi Branch
5			WAFED, Rupendhi Branch
6			WAFED, Butwal Branch
7			WAFED, Nawalparasi Branch
8			WAFED, Bajhang Branch
9			WAFED, Humla, Karnali Branch
10			WAFED, Kapilvastu Branch
11			WAFED, Sunsari Branch
12			WAFED, Sindhupalchok Branch
13			WAFED, Rasuwa Branch
14			WAFED, Dolakha Branch
15			WAFED, Sankhuwasabha Branch
16			WAFED, Gulmi Branch
17			Abhiyan Sewa Kendra
18			Kulekhani Bikas Samaj
19			Indreni
20			Kaligandaki A Project Affected

No.	Name of the River Basin	Name of the RBO	Name of the CSO
			Area Committee
21			National Federation of Irrigation Water users' Nepal
22			Mahakali River Concerned Society
23			Arun Concerned Group
24			Nepal River Conservation Trust (NRCT)
25			Anti-Pancheshwar-Purnagiri Dam Movement Committee, Dadeldhura
26			Koshi Pidit Samaj
27			West Seti Concerned Group
28			Karnali-Chisapani Sarokar Samuh
Pakistan			
		No RBO	*No CSO*
SRI LANKAN RIVER BASINS			
1	Indreni	Mahaweli Authority of Sri Lanka	*No. CSOs*

This reference document contains data for

- 38 River Basins in South Asia {India (19) and Bangladesh (3), Pakistan (6), Nepal (5) & Sri Lanka (5)}
- 17 tributaries in India
- 17 River Basin Organizations in South Asia {India (12), Bangladesh (4) & Sri Lanka (1)}
- 40 Civil Society Organizations in South Asia {India (6), Bangladesh (7), & Nepal (28)}
- The list of NGO's in Nepal contains organizations, which are working in the water sector but not necessarily with an IRBM perspective.

7. CONTEXT
[a] Water Policies In South Asian Countries

1. India :

Development of water resources has been a subject of national importance in all South Asian countries since the early 1950's mainly because it was believed that irrigation would provide food sufficiency and security, which, in those days was believed to be the key-stone of economic independence. However it was only in the 1980's that governments started looking at the water sector as an area that required a specific policy formulation. Consequently the Indian Parliament ratified the country's first National Water Policy in 1987[1]. Even though several policy statements had been made in other documents like the National Five Year Plans[2] and the National Commission on Agriculture[3], the National Water Policy, revised and promulgated in 2002[4], now represents the country's policy position in the water sector[4]. Its detailed and elaborated form is contained in the '*Integrated Water Resources Development: A Plan for Action', (National Commission on Integrated Water Resources Development Plan*, NCIWRDP, New Delhi, (1999) Ministry of Water Resources, Government of India)' published in 2000.

2. Pakistan :

In Pakistan the Ministry of Water and Power had made several policy statements from time to time regarding the development and use of the Indus River. The Ten Year Perspective Plan (2001) [5], and the Vision 2025[6] document provide the basic framework for the water sector. In addition, Pakistan launched a major study for developing the 'Water Resources Strategy' in 2001, which outlined a roadmap for the coming decades. The Ministry of Water and Power also released another document entitled the National Water Sector Profile (NWSP)[7], which, together with the 'National Water Sector Strategy' (NWSS)[8], identifies the key issues and objectives of the water sector and makes proposals for planning, development and management of water resources, and their use in all sub-sectors. Although the strategy encompasses urban and rural water-

sanitation, industrial supply, pollution control, hydropower and flood-protection, one finds a predominance of the irrigation sector primarily because 95% of Pakistan's fresh water is used for agriculture[9].

3. Sri Lanka :

The government of Sri Lanka also took a similar route. In 1995 the Cabinet adopted the 'Strategic Framework and Action Plan', which looked at a comprehensive water resources management approach and had the water policy embedded in this strategic framework. This was finally approved by the Sri Lankan cabinet, which was approved in 2000[10] .

4. Nepal:

The Government of Nepal started developing its 'Water Resources Strategy'[11] in 1996, and approved the final document in 2001. Nepal also has a 'National Water Plan'[12] for the period 2002-2027. Even though Nepal doesn't have a separate water policy, these two documents broadly contain the policy statements, strategic directions and the investments required.

5. Bangladesh :

The People's Republic of Bangladesh on the other hand has a specific document entitled 'National Water Policy',1999[13.] Formulated by the Water Resources Planning Organization, (WARPO), this policy statement has 84 different programs. WARPO has also prepared the National Water Resources Management Plan[14]. In addition, the new Bangladesh Water Development Board established in 2000, seeks to give legal cover to many of the policy directives contained in the country's water policy.

[b] The IWRM / IRBM approach in South Asian Policies.

A review of the policies and departmental practices in the South Asian countries indicates that till 1992, - i.e. till the enunciation of the Dublin Principles,

the integrated approach was not prevalent, either at the policy level or at the level of implementation and planning of water-related infrastructure projects. Almost all planning was done at the project level, while, the so called ‘Master Plans’ only described the potential location of dams and canals without indicating any systemic understanding or inter-sectoral linkages or interdependencies. The highway to water resource development was based on mega-dam projects, centralized water supply systems and trans-basin canals for intensive irrigation. The approach reflected a near-exclusion of any discussion on ground-water management, watershed conservation and development, rational and efficient water use, stakeholder participation in Plan-implementation and conflict resolution etc. For example, the National Water Policy, 1987 (India), made only a passing reference to the IRBM principles.

In the mid-nineties there appeared to be a shift in the policies and Plan approaches, from the purely ‘project based’ to ‘sectoral’ and then to the state of inter-sectoral integration. In case of the Water Resource Strategy in Nepal, this task was carried out by the Water and Energy Commission of the Government of Nepal. It talks about the water-sector as a means for human resource development, in a sustainable manner, and specifically includes the Environment Management Plan within the Water Sector Strategy. Further, the strategy is based on the assumption that it is principally hydro-power that will play the role of ‘water sector-driver’, and not the irrigation or drinking water sectors, as envisaged in earlier decades. The inter-sectoral integration is further strengthened by the fact that it was not only the irrigation engineers who formulated the National Water Plan, but that technocrats and engineers from the Water and Energy Commission (WECS) were principally responsible for developing the policy. Of course, this approach was also a reflection of the geo-political situation based on the realization that the irrigation potential in Nepal, especially in the central and northern regions, was rather small and that the only way to exploit the river-systems was through the generation of hydro-power. The strategy further talks of a shift from the conventional ‘development paradigm’ to

the ‘human, societal and environmental development paradigm’, and therefore the policy covers seemingly unrelated sectors like forestry, unemployment and poverty reduction issues, etc., as the first priority within the IWRM theme. Such an attitudinal shift is also found in policy formulations in recent years, in all the other South Asian Countries.

[c] Policy and Practice :

The ground level data on river basins broadly suggests that the IRBM principles have not been translated into action. The administrative and management structures continue to be ‘sectoral’ and ‘individual-project-based’. Barring a few exceptions River Basin Organizations / Agencies have not yet been mandated for dealing with inter-sector and holistic issues, or for preparing basin or sub-basin plans with stakeholders’ participation. Even in countries, which have a strong network of NGO’s (civil society organizations) like Bangladesh and India, there is practically no interaction between the governmental agencies and stakeholders on substantive issues, except of course in situations where there is dam-induced displacement of people. It appears that this situation exists more due to the historically determined socio-cultural attitudes rather than due to any lack of perception, or due to a lack of enabling policy instruments or statements. It is however, difficult to substantiate this view through factual or empirical hard data, but it seems to be a generally accepted view among the government agencies and people alike.

Another important factor which determines the extent to which policy statements get operationalised into ground level practices is the involvement of financial agencies and donors in the process of policy /strategy formulation. In the case of Nepal, for example, it was the World Bank and the Canadian International Development Agency, which contributed financially to the formulation of plans and strategies. Similarly, in case of India the World Bank played a crucial role in the process of water-sector-reforms and policy

formulations, while in Bangladesh, Sri Lanka and Pakistan, it was the Asian Development Bank, which substantially influenced the process.

It is widely accepted that 'external' involvement does bring in approaches and positions that add positive value to the sector performance and reform, which the respective governments would have liked to bring about, but found it socio-politically difficult to introduce. In addition, such changes in paradigm also enable countries to keep up with the global positions and visions in general, and in some cases, with statutorily binding conventions and internationally negotiated agreements.

However, experience shows that policies which have positions that have not yet been accepted or appreciated either by the government functionaries or stakeholders, get introduced through external influence, but remain merely on paper, for the sake of compliance with loan-conditionality. On the positive side, such policies trigger off democratic processes that lead to greater accountability, transparency and direct involvement of stakeholders in planning and decision-making.

[d] Water Policies and Water Partnerships:

Another external influence which has spurred the spread of the IWRM/ IRBM, is the spin-off from Water Partnerships. The formation of the Global Water Partnership and the subsequent National Water Partnerships, has taken the administrators and society a few steps closer to the holistic perspective. In India, the Zonal Water Partnerships and Area Water Partnerships (sub-basin and basin level, have also taken root. These are civil society organizations, which are freewheeling associations lobbying and advocating for integrated planning and management. In Bangladesh for example, the Bangladesh Water Partnership[15] and the Bangladesh Unnayian Parishad[16] have organized regional dialogues and multi-stakeholder platforms for negotiating on local issues , and for spreading of the World Water Vision framework. However, the bottom line is that

these processes are quite nascent, and it will be a few more years before one can study or measure results.

[e] Water Policy and Legislation:

Although there is a plethora of laws, notifications and guidelines in all South-Asian Countries, they do not have provisions, which can enforce the broadening of civic and stakeholder-involvement. Most of them are still couched within the principle of 'eminent domain', and as a result, decentralization or delegation of responsibilities and authority or the operation of the subsidiarity-principle are rarely being practiced. However, there are few exceptions, one of them being the Maharashtra Water Resources Regulatory Authority (Act) [17] 2005, passed in the State of Maharashtra India. Although it does not apply to the whole of India or even to a specific river basin, it contains all the important IRBM concepts and principles and has the statutory mandate for enforcing them in all the river basins within the state of Maharashtra in India. But then, this legislative instrument is also in its early phases of implementation, and results are yet to emerge.

[f] Water Policy and Environment:

By now all the South Asian Countries have included the 'river-eco-system' perception in their policy statements. The idea that the different water regimes are inter-linked and interdependent has been stated as a principle and the need to ensure 'Environmental Flows' (EF) has been recognized. Unfortunately, the task of actually assessing the needs for maintaining the environment flows has not been taken up in any major basin and it will be at least a decade before the idea seeps into the mindset of the river-basin managers and the society at large. The prevailing perception, although contentious, is that in most parts of South Asia, practically all basins are water scarce and that maintaining perennial environmental flows in such rivers is a luxury which South Asian countries can ill-afford. For example, many of the South-Asian Rivers like Krishna in India and

even the mighty Indus are discharging smaller and smaller quantities into the Arabian Sea and the Bay of Bengal.

The discussion on river pollution, on the other hand, has been fairly definitive as it impacts on the quality of water. A fair amount of policy change and reform has been talking place in most countries of South Asia, and the upturn in the trend lines showing improvement in water-quality may be round the corner.

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*** Foot Note :**

The State of Maharashtra has the upper water-sheds of the Krishna and Godavari (Cauvery) River basins and practically the whole of Tapi river basin. It covers an area of 30.77 million ha. and a population of about 100 million people. Being one of the most urbanized / industrial states, have 40@ of all large dams in India, the enactment of the MWRRA (Act) is most likely to have a ripple effect leading to similar enactments in other states in India. This regulatory Authority has wide – ranging powers, which can integrate the surface – water and ground water issues, set up five different RBO'

8. CONCLUSIONS AND LESSONS LEARNT

Conclusions.

1. The assessment of secondary data collected during the first half of 2007 leads us to a broad conclusion that the manner in which the data has been generated and maintained by the concerned Government agencies, is not adequate or compatible with the requirements of IRBM, or IWRM. The major data gaps are as follows;

(a) the natural ecosystems and environmental flows,

(b) comprehensive water balance studies, which include the ground water aspects at the river basin / sub basin or the micro basin levels,

(c) water quality data in different river regimes,

(d) potential irrigation created and actual utilization is not available at the disaggregated river basin level, however for the Country or for provinces it is available.

(e) per hector annual availability of water for irrigable areas in the basin, and annual per capita availability (time-series) for specific years when population census is conducted.

(f) Criteria for allocation of water for urban, industrial use, environmental flows and other uses; potential growth in demand for water for these sectors. (See table –DNA given at the end of this section)

It appears that the data collected by the state irrigation departments is meant primarily for determining the designs and drawings for dams and canals of specific projects, and not so much for allocating or managing the distribution of water in an efficient or integrated manner.

2. Of the 38 River basins assessed 12 river basins have River Basin Agencies (RBA) with statutory powers for performing some if not all of the basin management functions. And of the 12 RBA's it is only in State of Maharashtra, in India that there exist a comprehensive legislation which requires the setting

up of river basin organisations for Krishna, Godavari, Tapi and the west flowing rivers on the coast. This legislation was promulgated in 2005 and most of river basin management functions envisaged in it have not yet been operationalised. The upshot is that there exist no basin in South Asia which has a RBO/RBA which could be called “IRBM- compliant”, or which performs a majority of the functions stated earlier in this document. (See page 25).

3. On the positive side it may be noted that the following basic data is available for practically almost all the river basins and its major tributaries in South Asia, like the name/ alias relief map including states and provinces, geographic location population, location of Urban agglomeration, Average rainfall, Max-Min Temperatures, list of major tributaries, cropping patterns major, soil types, national parks and sanctuaries lakes and wetlands, the prevailing water related laws National/State policies, identification of critical issues on National and State water management

4. There are several civil society organisations working in the area of water and sanitation etc but few of them are working with the IRBM approach. Most of these organisation are currently working on one or more specific water issues, (e.g. rural or urban water-supply and sanitation, efficient use of water in irrigation, water pollution, micro watershed management, micro watershed development, ground water laws, water policy and advocacy, water and gender, water and health, etc.) but not on integrated water or (river basin) management as a whole. It has been observed that civil society organisations are formed usually in response to inadequacies in the statutorily established organisations. It is also been observed that the IRBM/ IWRM approach is being advocated more by academic and research institutions rather than the conventional NGO’s / CBO’s, etc. The survey reveals that there are, at best, just a handful of NGO’s who are working with a river basin perspective and advocating and lobbying for integrated management of river basins.

5. The survey further indicates that enabling legal instruments like the MWRRA in the State of Maharashtra (India) have come into existence more due to 'external conditionalities' or inducements from the World Bank or Asian Development Bank policy statements, and less due to demands and pressures from political constituencies within the countries. This leads us to a rather unfortunate conclusion that societal/ political perceptions are not yet ripe enough to demand or induce the creation of RBOs/ RBAs in South Asia, or even the IWRM paradigm in general.

Lessons Learnt:

a) Talent & Skills:

Interaction with resource persons has clearly indicated the availability of talent for organized work processes and skills to train and supervise operatives, either from within the country or from one of those under study. This indirectly prompts the viability of interventions, which may be undertaken with superimposed specialised management abilities.

b) Traditional Structures:

During the Activity it came to light that there are a number of vintage riverine riparian structures over one hundred years old. The capacities, or even the basic necessity of these has since undergone changes or deterioration. Whether these are suitable for planning of future capacities, or whether resuscitative measures need to be in place from the safety point of view has not been possible at this stage.

c) Co-operation:

The Activity has shown that with due planning at the start of the project it has been possible to not only bring together persons of diverse background and abilities, but to weld them into a responding team, the credit for which goes all the resource persons that their networking produced 75 per cent of the

information in the first flush within three months. This fact needs to be noted, and the readiness with which it can be applied to future requirements / studies on water-related issues, made note of, in the interest of continuity and data building.

9. Inferences.

All information in this Reference Document has been compiled from the inputs obtained by Country CapNets in Bangladesh, Nepal, Pakistan and Sri Lanka as sourced by them from available published data. For India, data has been provided by the resource persons from the documents and publications available with Gomukh Environmental Trust for Sustainable Development at Pune, and their interaction with the libraries and water management experts in India. Most of the inputs were received over the electronic media. The tabular inputs were discussed at the coordination center with reference to specific context of the requirement before acceptance. Those in the vernacular, and whose translations were possible, have also been taken into account for an objective analysis.

The outcome of the above presents a encouraging, albeit yet-too-raw, a picture of the efforts at indigenous river basin management in the five countries. It is, therefore, apparent that, if provided empowerment as envisaged in the international fora, the existing establishments can serve as the multipliers for semi-government and social bodies to expedite the platform for integrated and holistic management of water. This aspect can be seen in the following types of adequacies, viz.:-

- The inadequacy of the documentation systems at the sub-basin and tributary levels, and the need for their standardization - notwithstanding vernacular preferences, appears to be a primary obstacle.

- The establishment of qualitative measurement facilities for the existing and proposed monitoring of the use and distribution of water follows a close second.
- The perceptible absence of awareness to consider underground water as an essential quantum of the basin, and the consequent lack of data needs to be overcome through technical and coordinated means.

- The absence of effluent and sewage treatment plants in the river basins is a good indicator of the lack of importance attached to the care and recycling of water resources, and hence an obvious candidate for a specialist study.

- Social mores in the densely populated and sanitation-deficient river basins is an urgent necessity for the effectiveness of other initiatives.

- Accuracy of Data: It would be advantageous to remember that these countries are already labeled as “developing nations” where priorities for investment are towards the upliftment of basic facilities. It would not be misleading to expect that they would expend on newer laboratories or instrumentation, rather than on the upgradation of the existing facilities. Consequently, a lot of the documentation available with these countries would continue to be for the ‘primary’ or ‘preliminary’ tasks. Whether the results obtained by these facilities should be acceptable to plan newer initiatives is a subjective option.

In addition, documents are known to be replete with cases of a large number of out-dated water structures e.g. dams, canals, etc – many of them over one hundred years old, that provide no more than a decorative function on account of their reduced capacity, either due to siltation or having out-lived their structural life. These are often ignored by planners more for want of funds and technology, than for political expediency. This continued process and its potential hazard on one hand and the squandering of maintenance funds on uneconomic

resuscitation, on the other, is something that can offers opportunities for gainful interventions.

Taking into account the fact that countries are not devoid of local skills and have some expertise in rehabilitation, suggests that even micro-level approaches to overcome the afore-going could lead to instantaneous results for encouraging progressively higher interventions.

10. Recommendations

1. Based on the experience of putting together this reference document, it is recommended that this effort be treated as the first step, and be immediately followed by a more detailed study of river-basins in South Asia, in order to:

[a] Fill in factual data gaps

[b] Make systematic assessment of the remaining development potential on each of the river basins.

[c] Assess the potential for increasing the water-use efficiency and a more equitable spread of water [rather than further increasing storages]

[d] Assess financial need for development [storage / additional transmission canals]

[e] Assess financial requirement for conducting dynamic water-balance studies [inclusive of ground -water] on selected river basins, especially where the river basin is tending towards closure.

2. That, concerted efforts be made to initiate and establish river-basin-organisations [agencies] with full statutory and financial support, along with a clear mandate for making them “IRBM-compliant”.

3. That, states / national governments be encouraged and financially supported to establish a ‘bottom-up’ hierarchy of organisation scaled up from the micro-catchment level, to the level of a full river-basin, in order to establish

multi-stakeholder platforms for negotiating conflicts between “up-stream and down-stream” users, between urban / industrial and agrarian users, between fisher-folk and inland transporters, ecologists, hydro-power service providers, etc.

4. A fund be specially created for documenting traditional [pre-19th century] water management structures / systems and to assess the financial needs for restoring their functional uses, repairing, maintaining, retrofitting, and desilting them to original potential.

5. A study be made for assessing financial needs for repairing – maintaining the conventional [i.e. post 19th century] water infrastructure assets [dams / canals / water purification plants, draining and sanitation systems]

6. Assess financial needs for supporting “delta-disaster management systems” [i.e. “state-of-the-art” prevention, communication planning, relief and rehabilitation]

7. Study and assess the financial needs for developing inland water transport, [urban] public-water-transport systems which are known to be far cheaper than underground metros or road surface auto mobile transport systems.

8. Assess financial needs for supporting upper watershed conservation and dispersal ground water aquifers regulation and management.

10. FURTHER NETWORKING AND REFERENCES

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ANNEX I

SAMPLE FORMAT
OF DATA SHEET

Annex – II

DATA NOT AVAILABLE SHEET