Strategizing

The BAITARANI BASIN MANAGEMENT

For Sustainable Development and Poverty Alleviation

A CIVIL SOCIETY INITIATIVE

Towards Enabling Informed Choices & Enhancing Stakeholders Voices in Integrated & Futuristic Basin Resource Management for Sustainable Livelihood

CORE TEAM MEMBERS OF BRB INITIATIVE

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Sukanta Pradhan	BRA (Cdn)	M Sc (Bio-informatics)	> 5 yrs exp in NRM and livelihood
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1. PROJECT BACKGROUND

1.1 SITUATION IN THE BAITARANI RIVER BASIN

The Baitarani is one of six major rivers of Orissa, and its basin covers 8% of state's geographical area spread across 42 blocks of 8 districts (total 30 districts in the state). The Baitarani basin has been assessed as a surplus basin in terms of food and water by IWMI. However, there is higher incidence of poverty and inequity among largely tribal inhabitants in its upper catchments and a greater vulnerability to flood and natural calamities in its lower deltas. With growing industrialization threats of pollution and displacement also looms large over the inhabitants and offer challenges for future management water of quality and quantity. The developmental efforts in this region have also been sub-optimal due to lack of regional political capital coupled with a weaker governance system. There has also been dearth of desired integrated developmental interventions.

About two fifth of basin area is under agriculture while 30% are under forest. One fourth of the cultivated area in the basin is irrigated. Contribution of ground water to irrigation is about half. There is considerable scope for exploitation of water resources in the basin given the amount of water available and the lower irrigation percentage of the districts. More than four fifth of irrigation water is being used for grain crops and area under rabi irrigation is very less. Considering the water availability, ground water situation and status of agriculture ample scope is there to improve the food production and income from agriculture.

The drainage pattern of Baitarani river basin (central plateau) is dendritic type and flash flood is a natural character of such type of drainage pattern. Again since the upper catchment of Baitarani is full of hillocks and occurrence of a large number of drainage lines allow the run off generating over there to gush into the main river with greater force in very short span of time. The lower part of Baitarani is a part of greater Mahanadi & Brahmani delta, which has very less number of drainages to accommodate such high flows during monsoon rains. Therefore, flood is a regular phenomenon in the Baitarani basin and its inhabitants live with constant fears of loss to life and property. There have been 86 floods in hundred year's between1868 and 1967. Even a two-day rain in July, 2005 made it overflowed its banks affecting 140,000 people in 220 villages of Jajpur and Bhadrak districts. There are also at least two other cases embankment breaching and marooning in this year inflicting massive loss to life and property[1]. Apart from the long pending construction of dam at Bhimkund and proposed other measures like river bed excavation and construction of embankments etc. in the deltaic region, no serious thoughts or efforts have yet been directed towards integrated basin resources management and governance.

[1] http://www.dartmouth.edu/~floods/index.html

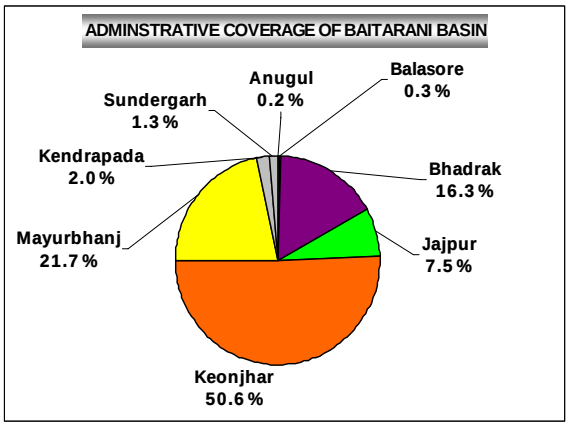
Broadly the basin lithology can be grouped into two types of geological formations i.e. consolidated and un-consolidated formations. The consolidated formations including the hard crystalline formations belonging to pre- Cambrian are found in the districts of Keonjhar, Mayurbhanj, Sundargarh, part of Anugul. The rock types are mainly granite, gneisses, schistose, khondalite and Quartzite. The unconsolidated quaternary formations including pleistocene, recent alluvium, older alluvium and laterites are found in the districts of Baleswar, Bhadrak, Jajpur and Kendrapara. The coastal sediments reflect varied depositional environments fluctuating from fluviatile to estuarine and marine. The alluvium of quaternary formations comprises of a thick sequence of clay, silt, gravels, pebbles and calcareous concretions.

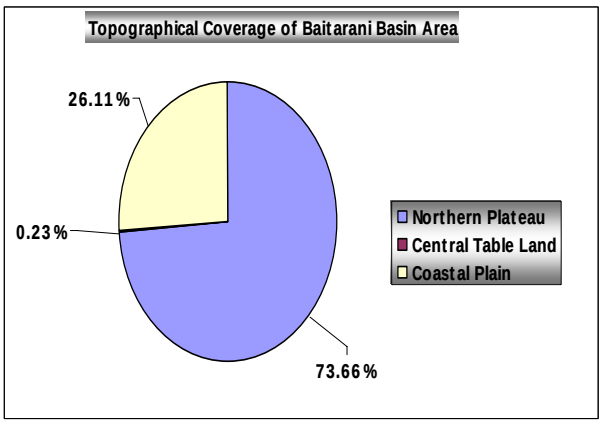
Upper and middle catchments of the basin hold rich mineral reserves of iron, manganese and chrome and thus mining and industrialization are expanding at a faster pace with states in India competing to attract foreign direct investments. Such plentiful natural (mineral, forest and agriculture) resources and availability of cheap labour makes this basin an ideal play ground for industrial units. Increased mining and industrial activities have already contributed significantly towards deterioration in the water quality. Community waste from domestic sector is now about four times the industrial effluent. All these wastes are discharged untreated into the water course causing deterioration of the water quality (Class C and D as per Central Pollution Control Board norm, unfit for drinking). In the front of water quantity, the present surface water withdrawal from the basin is about 7810 MCM (million cubic metre at 60% runoff with 75% dependable runoff) with agriculture accounting for 72%, forest 25%, domestic (rural, urban & livestock) 2.5% and industrial uses 0.18%. Present withdrawal per capita 2038 cum is higher than that of average of all basins (633 cum). Considering the precipitation input, there is a surplus of 1420 MCM (15% of available runoff). However, assuming runoff of 45% with a dependable runoff of 75%, the water balance becomes negative in the basin with a deficit of 887 MCM.

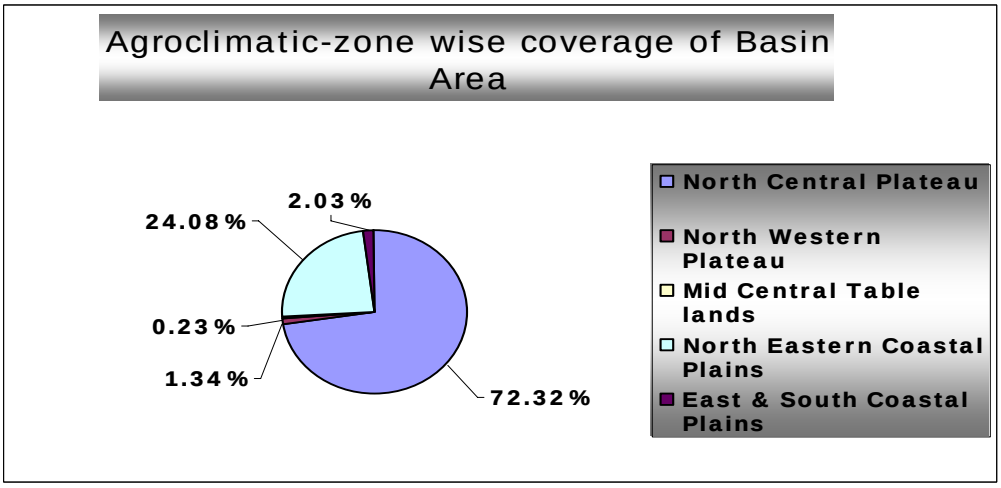
While such problems of water quality and quantity are looming large and the basin livelihoods and ecosystem are under threat, the stakeholders, particularly the rural communities and democratic decision making bodies are hardly aware about the issue, leave aside any plan as the unit of planning continues to be along administrative or political boundaries. There is no mechanism available at present to holistically assess and analyze the basin resources along natural boundaries and connect the communities and decision makers segregated along artificial boundaries. In absence of a perspective basin water and natural resource management plan, competing and conflicting uses (or abuses) of water and other connected natural resources are going on deteriorating the situation and with each day the crisis slipping steadily out of the grip. The situation demands urgent attention as it involves livelihood of 3.83 million people staying in 13481.82 sq km of area.

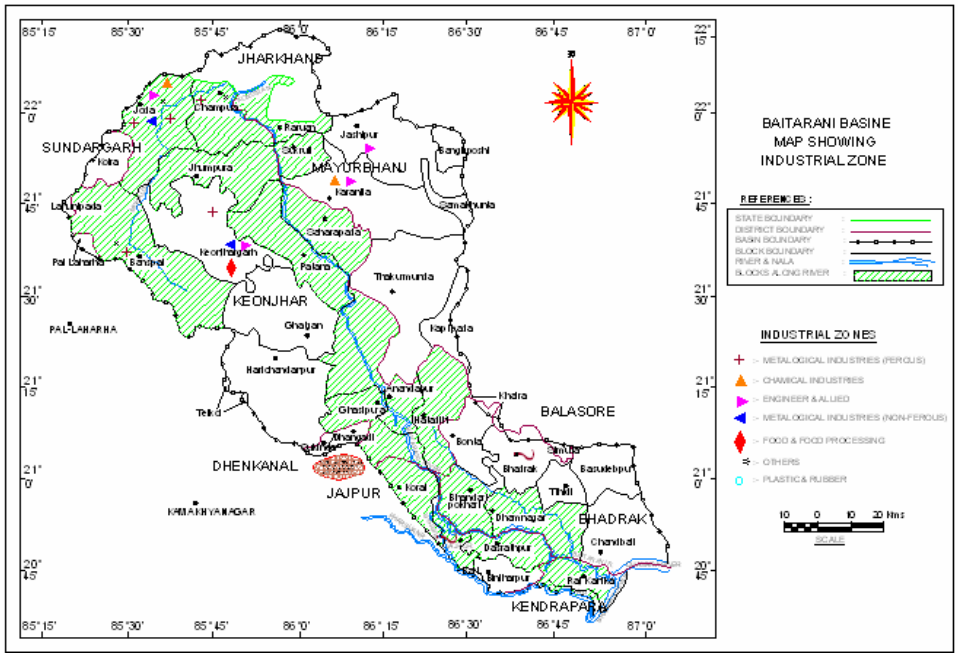
Table 1 Administrative Coverage of Baitarani River Basin in Orissa

Districts	Block Name	Geographical Area (Sq. km)	% of Block area inside basin	District Area in basin (Sq Km)	Block area in basin(Sq Km)
Angul	Pallahara	1,107	2.8	31.00	31.00
Balasore	Simulia	392	9.0	42.00	35.32
	Khaira	323	2.1		6.68
Bhadrak	Bant	283	94.2	2,198.00	266.58
	Bhandari Pokhari	312	100.1		312.46
	Dhamanagar	398	99.9		397.53
	Bhadrak	307	85.9		263.71
	Tihidi	151	100.0		151.00
Jajpur	Chandabali	574	87.4	1,005.93	501.40
	Basudevpur	497	61.4		305.32
	Korai	345	79.3		273.75
	Jajpur	219	77.1		168.74
	Dasarathpur	240	100.2		240.48
	Binjharpur	192	97.6		187.30
	Dangadi	264	26.6		70.10
	Sukinda	765	5.4		41.56
Keonjhar	Bari	182	13.2	6,824.07	24.00
	Joda	841	68.2		573.80
	Champua	311	100.0		311.00
	Jhumpura	512	100.0		512.00
	Banspal	1,229	77.6		953.23
	Harichandanpur	836	91.5		765.32
	Kendujhargarh	730	100.0		730.00
	Ghatgaon	694	100.0		694.00
	Patana	458	100.0		458.00
	Saharapada	384	100.0		384.00
	Anandapur-I	642	100.0		642.00
	Ghasipura	372	100.0		372.00
	Hatadihi	402	100.0		402.00
Mayurbhanj	Telkoi	1,060	2.5	2,925.82	26.72
	Jashipur	710	86.1		611.00
	Raruan	219	91.3		199.93
	Sukruli	187	100.0		187.00
	Karanjia	718	100.0		718.00
	Thakurmunda	910	99.3		903.83
	Kaptipada	712	20.4		145.60
	Shamakhunta	677	13.1		88.77
	Bangiriposhi	925	7.8		71.69
Kendrapada	Rajkanika	212	100.0	274.00	212.00
	Aul	215	28.8		62.00
Sundargarh	Koida	817	20.4	181.00	166.68
	Lahunipara	672	2.1		14.32
			Total	13,481.82	13,481.82


ADMINSTRATIVE COVERAGE OF BAITARANI BASIN
Anugul 0.2 %
Balasore 0.3 %
Sundergarh 1.3 %
Kendrapada 2.0 %
Bhadrak 16.3 %
Mayurbhanj 21.7 %
Jajpur 7.5 %
Keonjhar 50.6 %


Topographical Coverage of Baitarani Basin Area
26.11 %
0.23 %
73.66 %
Northern Plateau
Central Table Land
Coastal Plain


Agroclimatic-zone wise coverage of Basin Area
2.03 %
24.08 %
0.23 %
1.34 %
72.32 %
North Central Plateau
North Western Plateau
Mid Central Table lands
North Eastern Coastal Plains
East & South Coastal Plains


BAITARANI BASINE
MAP SHOWING
INDUSTRIAL ZONE
JHARKHAND
SUNDARGARH
MAYURBHANJ
KEONJHAR
DHENKANAL
JAJPUR
BALASORE
BHADRAK
KENDRAPARA
INDUSTRIAL ZONES

KEY BASIN INDICATORS

General		Water Resources	
Area	13482 Sq Km	Total No. Of Tributaries	65
No. Of Districts Covered	8	Water Balance	Water Surplus Basin
No. Of Blocks Covered	42	Water Quality(CPCB Standard)	Class-C/ Class-D
Length of the river	365 Kms	Major Pollutants	TC,FC
Shape & Size	Elongated	Dependence on surface water for drinking in 16 riparian blocks	30% (0.5 million people)
Catchment-delta Ratio	7:1	Floods between 1868-1967	86 Nos
Population	3.8 Millions	**Forest Resources(% to Geog Area)**	
ST (%)	27	Very dense	0.21%
SC (%)	18	Moderately dense	17.42%
BPL (%)	70.60	Open Forest	12.14%
Land Resources			
Land Use (%)		**Agriculture**	
Net Sown Area	42.4	Basin Cropping Intensity	145%
Culturable Waste	3.4	Fertilizer Consumption	
Permanent pasture	3.7	Kharif(Kg/ha)	47
Land put to Non-Agril Purpose	6.7	Rabi(Kg/ha)	53
Barren & Un-Culturable Land	5.6	Irrigation (%)	
Misc. Tree & Grooves	2.0	Kharif	32.9
Current & Other Fallows	5.6	Rabi	9.6
Forest Area	29.8	Per capita Food Grain Prod	87.1 Kg
		Paddy Productivity (t/ha)	1.67
Land Ownership			
Class-Based (%)		**Caste-Based (%)**	
Small Farmers no & area	29% & 31%	ST Holding & Area	34% & 32%
Marginal Farmers no & area	54% & 21%	SC Holding & Area	13% & 9%
Other Farmers no & area	17% & 48%	Other Holding & Area	53% & 59%
SF Agril area & Irrig area	32% & 32%	ST Agril area & Irrigated area	17% & 5%
MF Agril area & Irrigated area	22% & 24%	SC Agril area & Irrigated area	12% & 15%
OF Agril area & Irrigated area	46% & 45%	Other Agril area & Irrig. area	71% & 81%
Mineral Resources		**Workers**	
Total No Of Working Mines	186	Cultivator (%)	33
Area Under Working Mines	47,388.4 ha	Agril. Labour (%)	33
Total No Of Non-Working Mines	126	Household industry labour(%)	6
Area Under Non- Working Mines	9619.5 ha	Other Worker	28%
Storage of of Fe, Mn, Cr and Ni	1234 million t	Worker participation Rate	36.1 %
Basin Infrastructure			
Road density(per Sq Km)	1.3 Km	% of Villages electrified	85.4
Bank(per lakh Population)	8 Nos	Health centers per lakh popn	4.6
Market(per lakh Population)	1	Cooking (firewood:LPG:other)	14:1:10

1.2 RATIONALE OF BASIN LEVEL APPROACH

1.2.1 Natural, Basic Hydrological Unit and Beyond

River basins form the basic hydrological units for water resources planning and management. An overall plan for a river basin can more effectively meet the ever-increasing demand on the available water resources for varied uses. Planned and integrated management of a basin improve water and land resources management for food, livelihoods security and ecosystem sustainability. Basin management approach also offers scope to go beyond geo-hydrological unit, to accommodate and assimilate social, economic, cultural and political systems and processes existing and evolving inside the basin to arrive at sustainable livelihood and landscape transformation outcomes. In this process, basin management interfaces and integrates people, policies, technologies and management systems to meet needs of local and national development.

1.2.2 Link between 'field' and 'national/global'

Basin level works are the intermediaries between 'field' or 'farm' level actions and 'national' or 'global' level processes. Therefore, this option provides space to link the local with global and keeps potential to meet the often conflicting needs of both.

1.2.3 Indian National Water Policy[2]

As per National Water Policy, 2002, water resources available to the country should be brought within the category of utilizable resources to the maximum possible extent (Paragraph 3.1). It reiterates that water resources development and management will have to be planned for a hydrological unit such as drainage basin as a whole or for a sub-basin, multi-sectorally, taking into account surface and ground water for sustainable use incorporating quantity and quality aspects as well as environmental considerations. It adds that all individual developmental projects and proposals should be formulated and considered within the framework of such an overall plan keeping in view the existing agreements / awards for a basin or a sub-basin so that the best possible combination of options can be selected and sustained (paragraph 3.3). While dwelling upon institutional mechanisms, Water Policy emphasizes establishment of appropriate river basin organizations for the planned development and management of a river basin as a whole or sub-basins, wherever necessary. It also calls for setting up of special multidisciplinary units to prepare comprehensive plans taking into account not only the needs of irrigation but also harmonizing various other water uses, so that the available water resources are determined and put to optimum use having regard to existing agreements or awards of Tribunals under the relevant laws (paragraph 4.2). National Policy further makes it clear that the context of physical features and constraints of the hilly basin such as steep slopes, rapid run-off and

[2] http://www.wrmin.nic.in/policy/nwp2002.pdf

the incidence of soil erosion are to be taken into account while planning to provide assured drinking water, possibilities of hydro-power development and the proper approach to irrigation in such areas. The economic evaluation of projects in such areas should also take these factors into account (paragraph 6.4). There should also be a master plan for flood control and management for flood prone basin (Paragraph 17.1) and Baitarani is a flood-prone river.

1.2.4 Orissa State Water Policy[3]

There is provision to carry out water resources plan to assess the full water resources development option for the whole State based on the basin studies by Water Planning Organization in keeping with the water policy of the State. The Policy also proposes preparation of multipurpose river basin plans to guide decisions about future water development and basin management. The specific objective of this plan for multi-sectoral river basin water development include assessment of basin-water resources in light of its present and future uses; management of basin-water resources for maximum socio-economic benefits and least environment degradation along with prioritized meeting of the minimum nutritional per capital requirement (NPR) in the basin. The plan should also aim at increasing agricultural productivity and generate employment opportunity. Such basin plans should also include, as per the policy, provisions for examination of water quality and environmental consequences of water use with particular reference groundwater. The treatment of hazardous components of industrial wastes, sewage treatment, and use of fertilizers and pesticides in agriculture and optimization of the use of water by recycling and effluent treatment of industrial water also come under purview of basin plan and these are to be taken care of through necessary legislation and public awareness. Water quality due to saline water intrusion into the coastal aquifers, soil conservation, afforestation measures to reduce solid loss on the upper reaches of the river and reducing the silting of the surface water impoundments will be considered in the basin plan. The flood control and drainage components shall also be included in the basin plans in order to identify the extent and intensity of these problems along with the necessary measures to mitigate their effects. These plans will serve as the basis for the State Water Plan. The Policy also prescribes the inclusion of an environmental management plan in respect of all likely adverse impacts in the master plan of the river basin planning of the State.

1.2.5 Orissa State Agriculture Policy

State Policy prescribes reclamation of 0.3 million ha water- logged land, 0.4 m ha of salinity infested land, 0.5 m ha shifting cultivated area and 2.6 m ha facing soil erosion. On the irrigation front, it recommends coverage of 50% of cultivated area under effective irrigation system. While major and medium irrigation projects will cover 0.53 m ha, utilization of ground water, minor irrigation projects and Water harvesting structure will address irrigation needs in 0.13 m ah, 0.3 m ha and 0.2 m ha

[3] http://www.orissawater.com/statewaterpolicy.htm

respectively. Policy makes it clear that only creation of facility will not serve the purpose and adequate attentions is needed in the direction of maintenance and management of the system preferably through people's participation (Pani Panchayat system). Further, policy also calls for thrust on fisheries- both culture and capture on rivers, reservoirs, tanks and wetlands, thus creating alternate options for water use, which may create more demand and hence conflicting situations for use of water among interest groups. A basin level management option of natural resources with democratic governance can effectively address these land and water development needs envisaged in the Agriculture Policy.

2. PROJECT FRAMEWORK

2.1 GOAL

- Socially responsible and environmentally sound management of basin resources through effective stakeholder participation for sustainable basin livelihoods and resilient basin ecosystem health

2.2 VISION

- Enhanced stakeholders' access to options and tradeoffs in basin resources management within 2 years of project launch
- Operationalization of socially and environmentally responsible basin resource development within 5 years of project initiation
- Sustainable Basin development as reflected through enhanced livelihood and resilient ecosystem health by 10 years of project launch

2.3 MISSION

- Pursuing 'Informed' development through Knowledge and Action-Research based processes
- Forging partnerships with institutions and individuals to build synergies
- Empowerment of vulnerable stakeholders for enhanced participation in basin decision making

2.4 BROAD RESEARCH AGENDA

- Understanding the causes and effects of resource degradation & livelihood insecurity at basin scale from a holistic perspective
- Delineating and exploring critical/marginal resources and resource management/governance practices vis-à-vis basin livelihood and landscape

- Listing options and tradeoffs for sustainable resource management
- Connecting basin resource uses and users across basin landscapes
- Empowerment of basin stakeholders and enabling of basin institutions to take up futuristic basin management

2.5 CLIENT

- All basin stakeholders[4]
- Key client of the project is the tribal population in the upper catchment, displaced livelihoods in the middle transition zone and the flood-vulnerable poor in the coastal flood plains of the Baitarani River

2.6 OBJECTIVES

- To enable informed choices for basin stakeholders' by making accessible strategic basin level information
- To empower stakeholders towards democratic governance of basin resources and also to enhance there voices in basin resource management decisions
- To develop an approach road map towards perspective futuristic planning along with suggestive institutional set up for its operationalization

[4] Basin stakeholders have been identified and listed. They include resource users like communities (farmers, fishermen etc.), Corporate (Industry, miners etc.); service providers like Govt departments of Irrigation, water supply and sanitation etc.; policy and decision makers like Ministers, MP, Bureaucrats; regulators like River Authority, Tribunal, Commission, Court etc.; Policy influencers like NGOs, Media etc.; Civil society organizations- institutions of local self governance, Cooperatives, CBOs etc.

2.7 PROJECT PROCESSES/ACTIVITIES

Table 2 Objectives, Activities & Rationale of the Project

Objective / Activities	Rationale
Objective 1	
Review of integrated basin level processes in India and outside	☞ To enhance understanding of this emerging discipline of Integrated River Basin Management ☞ To enable incorporation of the learning ☞ To prevent reinvention of wheel
Secondary Basin Resource (natural, human and derived) appraisal and management/ governance processes – Thematic (4 themes) and Cross-thematic Appraisals	☞ To discover critical/marginal resources, issues and situations and to strategize/prioritize primary appraisal and planning ☞ To understand the impacts of local level actions on natural resources at the basin scale both now and in future
Primary intensive investigation of key basin issues under themes and on cross-themes	☞ To capture issues firsthand at closest quarters ☞ To go into the depth of causes and link the effects ☞ To get scope to interact with direct stakeholders, understand the perceptions and perspectives and discuss alternatives ☞ To initiate stakeholder dialogue process from the below, by passing on to them basin information and soliciting their opinions for sustainable basin resource management
Objective 2	
To initiate and support a basin dialogue process involving key-stakeholders	☞ To expand and further the basin management discourse by ensuring representation of all stakeholder groups ☞ To provide knowledge-based inputs for informed decision makings at different level
To facilitate processes, policies and supporting strategies	☞ To enable and empower stakeholders and institutions to act effectively ☞ To provide the decision makers an enhanced access to basin information to enable for meaningful decision makings
Objective 3	
To develop approaches for basin management plan	☞ To help all stakeholders understand their roles and responsibilities in management of basin resources and the need of their coming together

2.8 STRATEGY

2.8.1 Information as the key

- ☞ Rearranging information along natural basin scale for better assessment of status and to aid optimal resource management
- ☞ Not only collection, rearrangement and dissemination, but also rigorous analysis of data to generate meaningful information
- ☞ Enabling access to vital basin information to all basin stakeholders from communities to decision makers to enhance more meaningful contributions to basin resource management decision making

- Formation of a clearing house for information on basin resources and processes
- Facilitating unbiased, neutral, information based policy advocacy

2.8.2 Participatory

- Ensuring participation of stakeholders right from the beginning and across different phases of the project
- Making basin appraisal process inclusive by involving contributing stakeholders (Academia, researchers, civil society, Govt Departments etc.) and influencing stakeholders (Media, Govt Departments etc.) more actively in the project advisory boards
- Calling for participation of the communities, local NGOs, Govt departments at sample sites of primary intensive investigation
- Making the basin stakeholder dialogue process inclusive, broad-based and hierarchical to bring out representative basin opinions and perceptions
- Adopting participatory planning processes to prepare for approach map for basin plan development

2.8.3 Collaborative

- Focus on partnerships for making the process more effective and gain from synergies
- Forging collaboration with resource institutes working on related disciplines to gain from their experiences and resources.

2.9 THEMATIC TEAMS

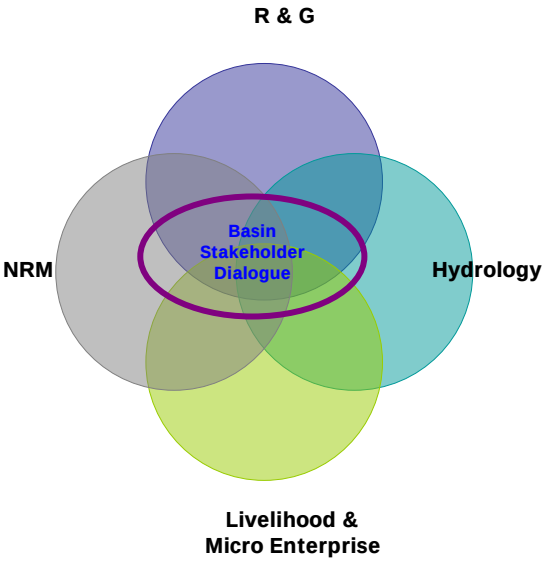


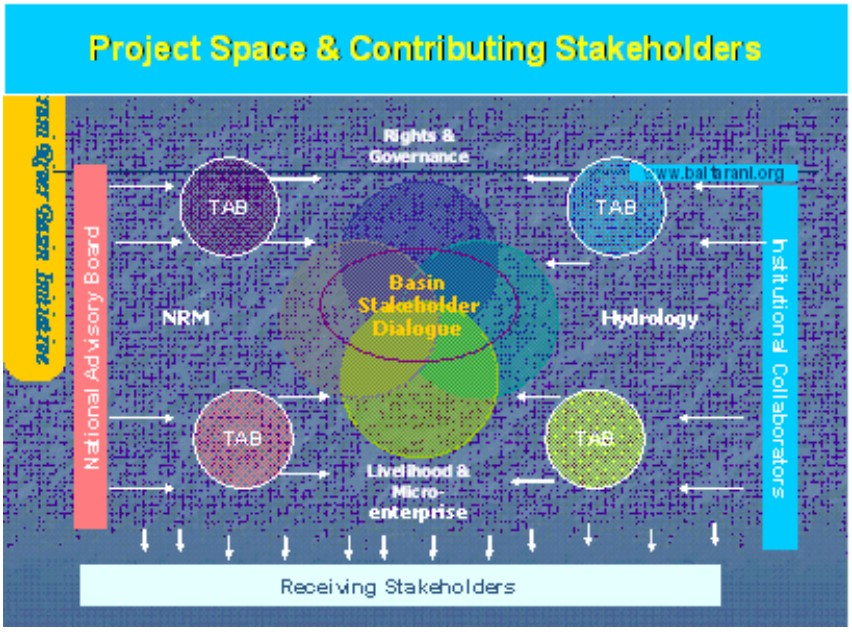
Table 3 Rationale, Concern and Focus of Project themes

Thematic Teams	Rationale	Concern	Thematic Focus
Hydrology	Water is the critical basin resource and its flows decide the basin landscape and boundaries. In this basin, deterioration of water quality in upper catchments, reduced environmental flow in channel and high flood frequency in coastal plain are some serious livelihood and ecosystem threats	Production & Conservation	Comprehensive appraisal hydrological elements and processes of basin Intensive investigation on issues related to water balance, water quality, flood management, agriculture water and wetlands
Natural Resource Management	Natural resources hold keys to basin livelihoods considering the dependence on agriculture and forests in the basin and opulent mineral reserves with mushrooming mining industries. Considering the interdependence of natural resources, addressing all of them together is quite natural.	Production & Conservation	Comprehensive appraisal of natural resources and their use processes Intensive investigation on traditional natural resource management; choices before hill farming systems and flood plain agriculture; blue and green water options with focus on small holders
Rights & Governance	Tribal land alienation and complex forest tenures on upper catchments with absentee landlords and share-cropping in coastal plains influences land use efficiency in the basin. This along with weakening of democratic governance of natural resource makes access to NR a key issue in the basin, which not only influences livelihood in the basin, also its ecological health.	Access	Comprehensive appraisal of policies and institutions in the basin along with state of present governance Intensive investigation into property rights, environmental governance, gender and NR-based institutions
Livelihood & Micro-enterprise	Livelihood vulnerabilities are the cause and result of basin resources degradation and influence of market, credit and institutions, apart from natural resources and policy influence to a considerable extent the livelihood options in the basin. Moreover access transforms to absorption when income is available	Absorption	Comprehensive appraisal of livelihoods, skills, market and credit infrastructure and their interactions etc. Intensive investigation into livelihood shifts in critical basin areas and the options available to enhance livelihoods with focus on water-based options.

Apart from these four thematic areas, project will look at cross-thematic overlaps and trans-thematic areas to make holistic appraisal of basin and delineate possible options and tradeoffs for sustainable livelihoods and landscapes in the basin

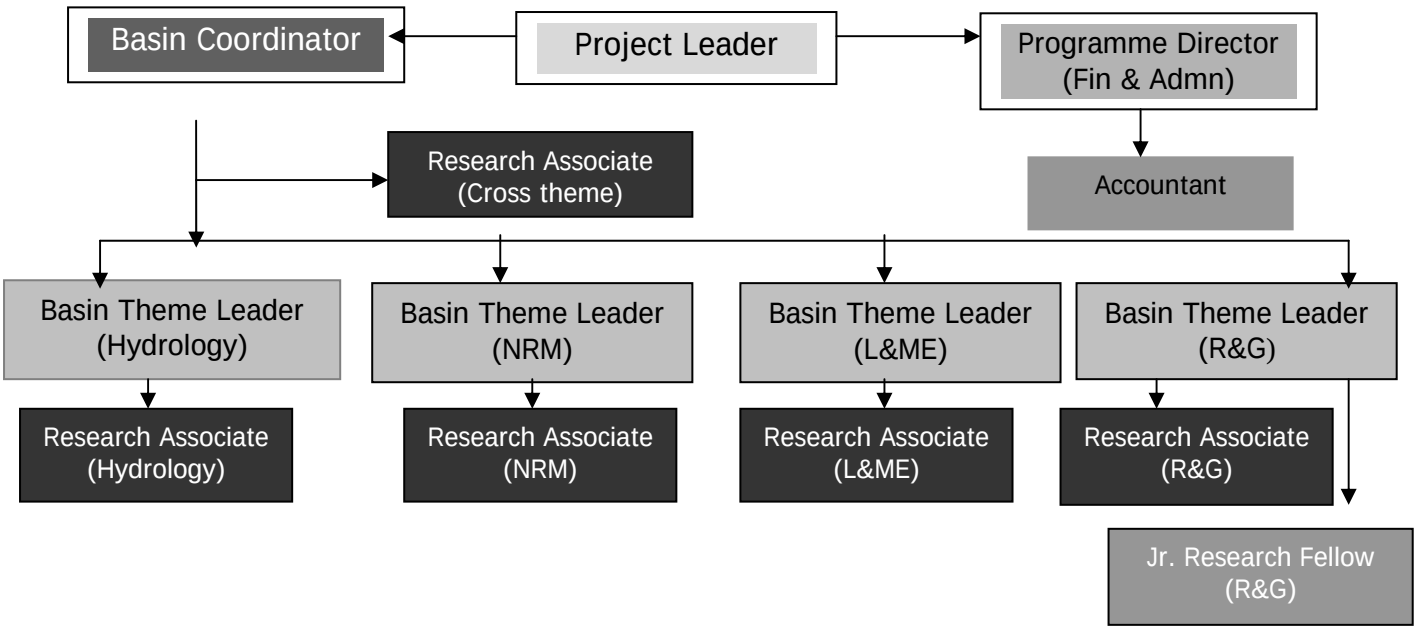
2.10 PARTNERS

Project is forging partnerships through formal collaboration with individuals (national and local advisory boards and consultants) and organizations (Research Institutions, NGO and Govt Agencies) to gain from synergies.



TAB: Thematic Advisory Board (constituted with local experts drawn from academia, NGOs, Govt Departments and experienced individuals)

2.11 ORGANOGRAM (CORE TEAM)



3. BROAD METHODOLOGY

3.1 AT PROJECT LEVEL

Table 4 Project level Methodology as per Objectives

Objective/Activities	Methodology / Procedures
Objective 1	
Secondary Appraisal	Thematic literature review of basin management issues and processes in other Indian and foreign basins through browsing of soft (internet) and hard sources of information
	Strategic appraisal of basin resources, institutions, policies, management processes and influences along and across project themes from published and grey literatures and statistics available with different Govt, Non-Govt, Quasi-Govt agencies
	Understanding processes, identification of linkages, Analysis of trends and delineation of critical issues (and areas, key stakeholders etc.) for further investigation through analysis of information, peer-group discussions etc.
Primary Appraisal	Intensive information collection from primary sources on critical issues Villages/locations will be selected through stratified purposive sampling Information collection through in-depth probing through participatory and exploratory processes - qualitative and quantitative (PRA, FGD, Questionnaire, Field transact, Survey and measurements etc.) Sharing information and initiating stakeholder dialogue through formal meetings
Objective 2	
Basin Stakeholder dialogue	Pure and Mixed Group stakeholder dialogues (Groups : PRI, CBOs, NGO, Politicians, Academicians, Bureaucrats, Technocrats, Industry) ▪ Sharing of appraisal findings and recording key feedbacks ▪ Recording planning suggestions Multi-stakeholder basin dialogue (at basin level) Representatives from each group Sharing with them the draft plan and seeking feedbacks Process will start right from the primary information collection stage First dialogue process to be kick-started with basin-transact by the study team Dialogue process will be structured and hierarchical In a two-way process, they will be apprised of basin information and their opinion and perception about basin processes and vision plan would be documented
Objective 3	
Development of Approach paper and strategy for vision plan preparation	With involvement of stakeholders and collaborative partners By analysis of information collected To develop an approach road map towards perspective futuristic planning Also to suggest institutional set up and strategies for operationalization

3.2 THEMATIC TEAM & CROSS-THEMATIC LEVEL

Table 4 Thematic Team level Methodology as per Activities

Activity					
	Integrated	Hydrology	NRM	Livelihood	R & G
	KEY TOPICS/ASPECTS				
Secondary Review : Other Basin Experiences	Integrated River Basin Management; Ecosystem services;	Environmental flow Water Balance Water Quality Flood Water logging	Integrated resource management	Livelihood frameworks	Basin Institutions & Governance; Gender, Equity, Property rights; Conflict
Secondary Review : Basin Resource Appraisal (BRA)	Demography, Area, GIS maps, Mining-livelihood-NR-hydrology linkages, Traditional NR Governance	Ground Water Surface water Water Quality Hydro-meteorology Agriculture water	Land & Agriculture; Forest & Biodiversity; Livestock & Fisheries; Mines and Minerals; Energy	Livelihood Market Credit Physical infrastructure – communication, storage/ processing etc.	Laws & Policies related to NR and Institutions; Formal and Informal Institutions involved in NR; Projects and programs in NR
Analysis of trends, linkages, influences, cause-effect relationships, impacts and delineation and prioritization of critical issues, places for further probing					
Primary Basin Appraisal	Intensive exploration of specific issues under different themes at different zones of basin including sensitization of basin-stakeholders about basin framework				
Basin stakeholder dialogue processes	Series of hierarchical stakeholder dialogue from below				

3.3 THEMATIC OBJECTIVES

3.3.1 Hydrology Theme

The broad objective of the hydrology thematic group is to have a comprehensive hydrological appraisal of the basin and to explore interlinks between hydrologic, socio-economic and environmental aspects of water management at multiple dimension. Among others, the hydrological basin appraisal works will focus on the following four aspects:

- Water balance study of the entire basin
- Water Quality Assessment of Surface and Ground Water
- Flood Analysis
- Water logging and salinity hazards

As part of comprehensive hydrological appraisal, the group proposes to take up the following specific studies in the basin

- Seasonal variation in surface water flow and Groundwater fluctuation
- Appraisal of Geo- hydrological condition of the basin for artificial groundwater recharge.
- Seasonal overall water availability and demand of the basin
- In-situ rainwater harvesting options
- Change of land use pattern and its effect on local hydrology.
- Interaction of mining activities with qualitative and quantitative aspects of water

3.3.2 Natural Resources Management Theme

The NRM Study will focus on analysis of status, trend and identification of spatial and temporal issues on the following resources and their management patterns (traditional and ongoing) to generate strategic information for enhanced and transparent decision making by basin stakeholders

- Land, land-use and land-husbandry
- Agriculture, Farming Systems (including livestock, fisheries, horticulture etc.) and Food Security
- Forest, NTFP and Biodiversity (Floral & Faunal)
- Minerals

NRM themes look towards to carry out the process of information collection and generation through collaborative and participatory efforts with help of contributing and user-stakeholders with an aim to augment the followings -

- ☞ Increased access to information by basin natural resource users about the possible impact of their resources use on others and future generations
- ☞ Adoption of basin-wide appropriate land-husbandry practices for better basin-ecosystem health and sustainable food security
- ☞ Enhanced farm production and productivity particularly of small and marginal farms on tribal uplands and coastal flood plains
- ☞ Practicing of effective farming systems to generate marketable surplus and enhance livelihood diversification
- ☞ Increased participation of communities in basin resources management decision makings

3.3.3 Rights & Governance Theme

The objective of Rights and Governance Theme is to understand study and analyze the traditional and existing institutions and governance system, access and control over natural resources, participation of stakeholders in basin resource management and existing socio-economic, socio-political and socio-legal issues in the basin region.

The major objectives of the theme is

- Appraisal of traditional and existing water management systems and governance by community and statutory bodies
- Access, management and control of NR's and its legal implications.
- Need for the involvement of stakeholders and public participation in the basin resource management with democratic dialogue
- Issue of displacement, resettlement, rehabilitation, compensatory afforestation in the basin affecting livelihood and landscape.

3.3.4 Livelihood & Micro-Enterprise Theme

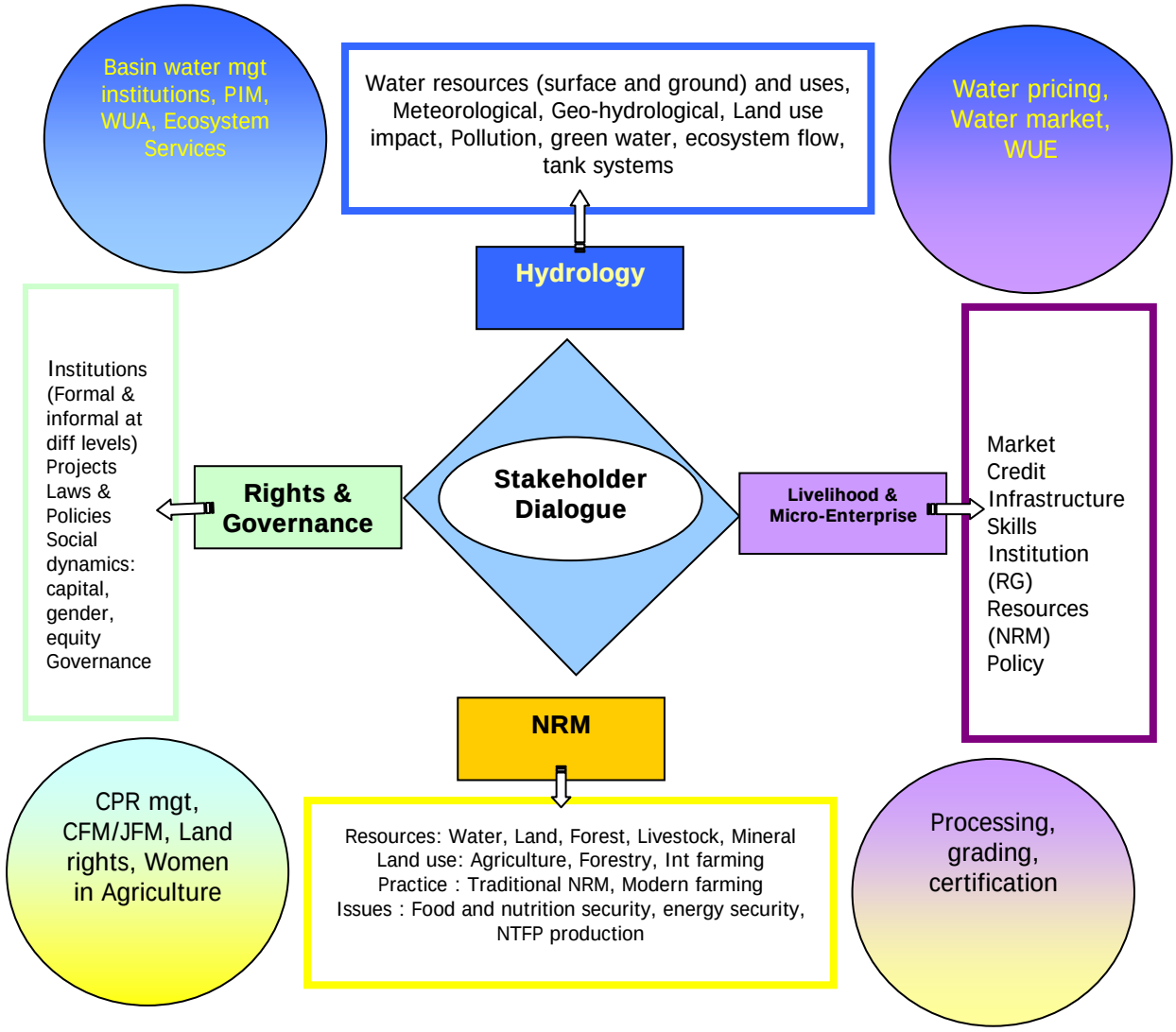
The broad objective of the Livelihood and Micro enterprise thematic group is to have a comprehensive livelihoods appraisal of the basin ad strategic livelihood enhancement action planning from the perspectives of interplay between Hydrology, Natural Resource Management & Right & Governance themes. The basin livelihoods appraisal works try to focus on the following aspects:

- Comprehensive appraisal of livelihoods, skills, markets and credit infrastructure & their interaction etc.
- Intensive investigation into livelihood shifts in critical basin areas and the options available to enhance livelihoods with focus on water based and natural resource based options.
- Identify the role of livelihood *diversification* in both upward (accumulation) and downward (coping) strategies.

The major aim is to give the following out comes

- More income with respect to best possible use of natural resources, Increased well being, Reduced vulnerability, Improved food security, Life with more status and dignity and Recognition in society.

3.4 SUGGESTIVE FRAMEWORK SHOWING TYPOLOGIES OF BASIN ISSUES PROPOSED TO BE ADDRESSED AND THEIR THEMATIC LINKAGES



3.5 TIME LINE

2006								2007	
May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Team Building Phase	Inception Phase	Basin Appraisal Phase				Basin Resource Management Plan Development Phase			
		Stakeholder dialogue Phase							

Team Building Phase	• Advertisement for positions in DevNetJobs.org & DNRM list • Recruitment Process
Inception Phase	• Understanding of the project (concept, objective, rationale, aspects process, outcomes etc.) by the team members • Role understanding of team members • Developing team (theme-wise) and individual Operational frameworks • Organization of Launching Workshop • Secondary of basin management processes in and outside India
Basin Appraisal Phase	• Secondary review of information about natural and human resource base covering economic, social and environmental attributes, resource management patterns across theme and cross-themes • Primary investigation of critical issues in field for themes and cross-themes • Sensitization of basin communities in these sites and also initiation of first stage stakeholder dialogue process
Stakeholder Dialogue Phase	• Hierarchical basin stakeholder dialogue from village level
Basin Resource Management Plan Development Phase	• Development of road map and approaches for basin management plan in a participatory and collaborative framework
Looking at the limited time in hand and enormity of task, the appraisal and planning will be strategic and stakeholder dialogue will be limited in numbers and in all these cases collaborative linkages with partners will be forged to gain from synergies.	

4. OUTPUT

- **Information Generation along Basin Scale** : Strategic assessment of status of five livelihood assets in the basin along with structural and policy environments governing influence and access
- **Easy access to Critical Basin Information** : Enhanced stakeholders' awareness about water (and other resource) rights, uses, basin-responsibilities and about resource use implications on basin landscapes and livelihoods across spatial and temporal scale. Basin decision making fact sheets, working papers and basin level data/information will be made easily available through internet and print media
- **Creation of Platforms for basin negotiations:** Stakeholder realization of need of frequent basin level dialogues and continuous consultations for basin resource management and hence creation of space for institutions for sustainable and equitable resource management
- **NRM Option/approach Plan** for livelihood Development of the Client populations - A Process/approach which can be replicable elsewhere in other basins

- **A future road map** and facilitating stakeholders to take up further action in the basin
- Providing **templates for more informed and logical decision making** to the decision makers

5. ENVISAGED IMPACTS

5.1 Ecological

- Maintenance of environmental flow in the river and flood mitigation
- Maintenance of water quality in the wake of upcoming mining and industrial activities
- Better and effective (blue and green) water utilization with right farming systems to optimize production
- Reduced risk from drought and flood
- Safeguarded basin ecosystem health

5.2 Economical

- Promotion of appropriate farming systems for small holders which will generate marketable surplus of key commodities
- Availability of allied and non-farm based enterprises options for augmenting livelihood of vulnerable and landless
- Better supply chain management and greater market control by these small producers, forest produce collectors and enterprisers.

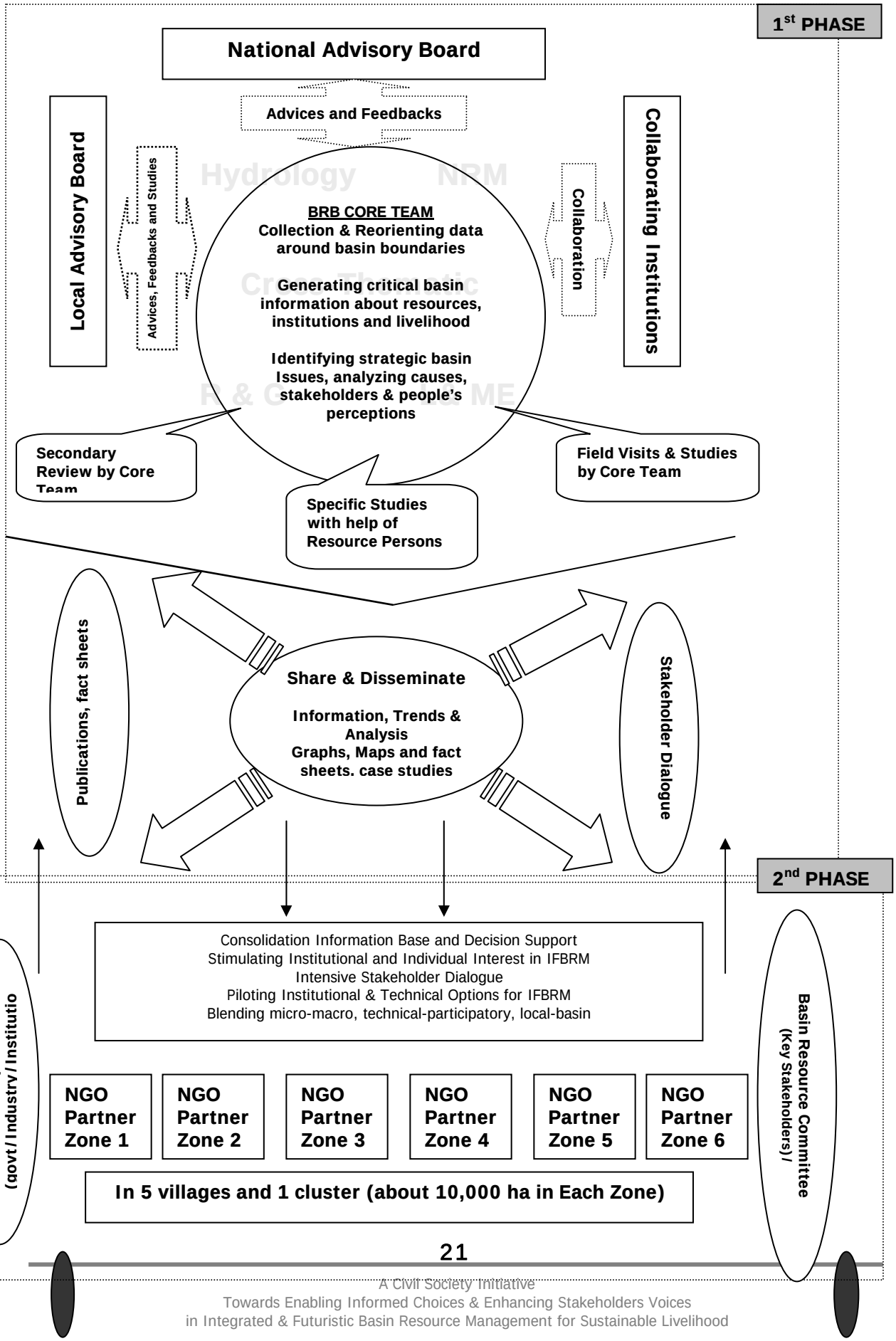
5.3 Social

- Higher awareness about basin perspectives of resource use
- Frequent direct interaction and increased water literacy among basin stakeholders
- Creation of pyramidal water institutions
- Responsive property rights and governance regime to promote livelihoods and to encourage responsible use of basin resources
- Increased appreciation of role of women in resource management with focus on water
- Better and easy water-conflicts resolution

6. DONOR

The Project has been funded by Sir Dorabji Tata Trust, Mumbai.The **SIR DORABJI TATA TRUST** extends its support to individuals, institutions and Organization striving to make a difference. It demonstrates the power of Purposeful Philanthropy in the development of a progressive nation, while promoting excellence and relevance in all areas of human endeavour. www.dorabjitatatrust.org

7. PROJECT CONCEPTUAL FRAMEWORK



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.....Towards socially and environmentally responsible basin resources management.....

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