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Institutional Assessment

**Reviewing policies, processes and stakeholder
positions at the Kolkata peri-urban interface**

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DFID Natural Resources Systems Programme

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1. Introduction

The Calcutta peri-urban (PU) area, particularly to the east of the city, supports the livelihoods of a large number of people through natural resource-use. Of especial note, as it is the largest such system in the world, is the 12,000 ha Waste Recycling Region (WRR) for Calcutta city in which wastewater is reused to produce fish and rice, and solid waste is re-used to produce vegetables. Although PU farming provides various services for the city, in particular low-cost wastewater treatment in the WRR, it is constrained by urban expansion. This is reflected by population growth of the 1,380 km² Calcutta Metropolitan Area (CMA), which includes PU and rural areas, being almost double that of the 187 km² Calcutta Municipal Corporation (CMC) area (calculations by Gupta, 2000, based on data from West Bengal State Planning Board, 1996). Although the CMC may be considered as the “City of Calcutta” because it consists primarily of built-up land, it also includes the western 25% of the WRR.

The WRR is the best-studied area in PU Calcutta. The following account of its contribution to livelihoods is from the “Base Line Document for Management Action Plan” for the “East Calcutta Wetlands and Waste Recycling Region” (CMWSA, c. 1996). The 12,000 ha area has a total population of almost 62,000 people comprising a workforce of almost 17,000 people according to the 1991 census. About 3,800 ha of wastewater-fed fishponds employ >8,500 persons directly and, there are 6,000 ha of wastewater-fed rice fields and 4,000 people engaged in vegetable farming on garbage. Additionally 20,000-25,000 waste pickers work at the Dhapa dump. Numerous people are involved in trading produce from the WRR which provides relatively low-cost food for the city’s poor.

The WRR was proposed as a conservation area in a 1985 West Bengal State Planning Board project but was not given legal status until an NGO, People United for Better Living in Calcutta (PUBLIC) won a case in the Calcutta High Court in 1992 against the Government of West Bengal which proposed the development of 784 ha for a World Trade Centre. Land use cannot now be legally changed from agricultural to residential or commercial in the WRR. Further protection is provided in the WRR and elsewhere in the State by the Inland Fisheries (Amendment) Act, 1993 which states that water bodies measuring 5 catas (350 m²) or more capable of being used as a fishery are not allowed to be converted into uses other than fish culture (Kundu et al., 1997). Despite these legal provisions, urban encroachment in PU areas continues. As reported by CEMSAP (1997), “fierce interest group competition to secure access to the resources has stimulated unauthorized use of land on extensive scale”. One of the proposed actions by the project team of the above study is “to initiate perception studies on the different interest groups and stakeholders over different parts of the study area with a view to understanding the prospects of conflict resolution between these”. The senior stakeholder interviews carried out during this mission are a small step towards implementing the above recommendation.

2. Donors

Perhaps the first major donor funded activity was the International Seminar on Wastewater Reclamation and Reuse for Aquaculture held in Calcutta in 1988 (Edwards and Pullin, 1990). It was organized by the UNDP-World Bank Water and Sanitation Program, ESCAP and the Government of India as an activity of the International Water Supply and

Sanitation Decade which aimed to promote low-cost and non-conventional methods to alleviate poverty and safeguard health. A recommendation of the Seminar was that the Calcutta wastewater-fed aquacultural system, the largest in the world, should be studied as a possible model for appropriate sewage treatment and reuse systems in India and elsewhere.

DFID (then ODA) financed a project identification mission (PIM) by the Asian Institute of Technology (AIT) in 1990 following on from the recommendations of the Calcutta seminar to prepare a research proposal to examine the role of wastewater-fed aquaculture in the development of alternative low-cost sewage treatment (AIT, 1991). A second DFID funded PIM comprising Lagoon Technology International and AIT staff was fielded in 1993 (LTI, 1993). DFID did not fund the research because an ODA Review Mission in 1994 was unable to identify potential customers for the output of the research because of its “multidisciplinary features, its bioecological complexity, its economic characteristics and its institutional structures”. Furthermore, the “project outline has not been agreed by GoWB, who appear to consider their own capacity to be more than adequate for any work in this area, and would seem to prefer a physical development project” (ODA, 1994). However, the second PIM led to the development of an improved design for wastewater-fed aquaculture which may be used for future R & D (Mara et al., 1993).

The next donor-funded initiative from a natural resources perspective is the current DFID funded project on “Renewable natural resource-use in livelihoods at the Calcutta peri-urban interface” of which this stakeholder analysis is a part.

During preparation for this mission, other relevant DFID funded initiatives were identified, which serve to emphasize one of the conclusions of the 1994 ODA Review Mission of the institutional complexity of natural resource use in Calcutta. To promote sustainable urban development the GoWB commissioned the Calcutta Environmental Management Strategy and Action Plan (CEMSAP) with assistance from DFID to support institutional strengthening and coordination across all sectors relevant to environmental management (CEMSAP, 1997). The main objectives were to:

- provide a **frame work** for **enabling** sustained environmental improvements to reconcile pro-development and pro-environment goals; and
- develop the means to introduce stronger environmental decision-making **processes** at all levels.

The emphasis within CEMSAP was on growth because it was recognised that it is a necessary **enabling** condition to create the resources required to achieve sustained environmental improvement and poverty alleviation. It was further recognized that the defining characteristics of Calcutta’s environment are poverty and poor resource management with the need for cost recovery pricing. CEMSAP fitted into an emerging international agenda with The World Bank, UNDP and WHO expressing interest in supporting various components.

DFID also provided initial support to CEMSAP initiatives, including “sewage and wastewater treatment and reuse”. A detailed study was carried out by the Department of Environment, GoWB with DFID assistance on the management of the East Calcutta

Wetland and canal systems (DoE, 1997). This was followed up by the establishment of a special committee by the DoE to advise on the development and management of Calcutta's canals and wetlands (DoE, 1999).

The latest DFID funded initiative which apparently supercedes CEMSAP, is CUSP (Calcutta Urban Services for the Poor) programme, which was in the design consultancy phase during the mission. The programme has three components:

- improved urban planning at metropolitan and municipal levels
- improved access by the poor to services, and
- promotion of sustainable economic development

The £50-£70 million programme will be implemented over 7-10 years.

3. Mission

The ToR (outline of activities), itinerary and persons interviewed, and summaries of the interviews themselves are in Appendices 1, 2 and 3, respectively.

3.1. Senior stakeholder analysis

Points of view of various stakeholders were elicited by the interviews. Gaining a better understanding of the views and perceptions of different interest groups is an essential first step towards conflict resolution between them. Almost none of what is written below is new, and much has already been published in the voluminous literature on the Calcutta PU area; but this may be the first time that an attempt has been made to systematically outline contentious issues and possible win-win situations for protagonists (Nierenberg, 1986; Helps, 1992; Ury, 1993).

4. Contentious issues

4.1. Definition of wetlands and water bodies

Calcutta is bounded to the west by the Hugli river and to the east by an area of former brackish water comprising tidal rivers and creeks, swamps and lakes popularly known as the "East Calcutta Wetlands" (Sarkar, 1990). Over the course of more than a century the area has silted up and been converted into mainly agricultural land with the remaining water bodies now freshwater. There is a large, 12,000 ha central area of wastewater-fed fishponds, rice fields and wastewater and garbage-fed vegetable farms. This central area has been legally recognized by a 1992 ruling of the Calcutta High Court, as a conservation area with the official title of the "East Calcutta Wetlands and Waste Recycling Region" (WRR) in which land use cannot be legally changed from agriculture and aquaculture to residential or commercial purposes. The WRR, which the project has focused on to date for mainly logistic reasons is about to be declared a Ramsar site with support of the

Government of both West Bengal and India which accords it status as a wetland with international recognition which should confer further protection from urban / industrial development. However current, predominant “wise-use” for human activity is permitted under the Ramsar definition of wetlands. Additional legal protection is provided through the Inland Fisheries (Amendment) Act of 1993 which prohibits water bodies of 5 catak or greater (350 m²) capable of being used as a fishery from being converted into uses other than fish culture.

Defining wetlands is controversial because of the wide diversity of ecosystems which lie at the dry land / open water interface, and difficulty in demarcating boundaries of wetland ecosystems (Kundu et al., 1997). One of the earliest definitions of wetlands is that of the U.S. Fish and Wildlife Service in 1956: “wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water”. The most accepted definition, and the one with most relevance for PU Calcutta because the WRR is going to be accorded Ramsar status and the definition is accepted by the Government of India, is that of the 1971 Ramsar Convention in which wetlands are defined as “areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six metres”. Furthermore, wetlands may be considered either as natural ecosystems or as human made including ponds, lakes and reservoirs. A concept of wise-use is included in Article 3.1 of the 1971 Ramsar Convention which states that Contracting Parties “shall formulate and implement their planning so as to promote the conservation of the wetlands included in the List, and as far as possible the wise-use of wetlands in their territory”. The definition of wise-use was adopted in 1987 at the Third Meeting of the Conference of the Contracting Parties: “the wise use of wetlands is their sustainable utilization for the benefit of humankind in a way compatible with the maintenance of the natural properties of the ecosystem” (CMWSA, undated).

Clearly much of lower West Bengal state in general, and PU Calcutta in particular, is wetland according to internationally and nationally recognized definitions of “wetlands” and their “wise-use”. This severely constrains urbanization and industrialization in PU Calcutta as the DoF and NGOs attempt to ensure strict enforcement of the law, leading to reportedly widespread illegal development of wetlands. All development agencies interviewed stated that they respect the law but WBIDC emphasized that the definitions are overly restrictive for development and called for expert opinion to establish a more realistic definition.

4.2. Type of development

There is a polarisation of views concerning the most appropriate type of development in PU Calcutta: indigenous rural / agricultural or western urban / industrial. The DoF and NGOs are the main supporters of the former and development agencies such as CMDA, HIDCO and WBIDC support the latter.

According to the former view, the current strategy of wise-use in accordance with the ecology of the wetlands is the best as many poor people would be deprived of a livelihood if more urban / industrial development were to take place. The DoF wants to enhance the

economic viability of the fisheries to demonstrate that “indigenous systems of natural resource use”, including ecotourism, have potential for sustainable livelihoods of the 70% of the population of India who still live in villages as a viable alternative to the western development model of large cities and factories. It was stated that Indian planners have been largely educated in the west and do not appreciate rural life and culture. Development should be frozen in the WRR and in wetlands elsewhere in PU Calcutta and throughout the State of West Bengal.

According to the latter view, economic growth is a factor in achieving poverty alleviation as well as sustainable improvement of the environment (CEMSAP, 1997). A recent World Bank study shows a direct correlation between the incomes of the poor and the average national incomes of people in countries of the world, indicating that general economic growth leads to a reduction in poverty. Another World Bank study predicts that economic growth over the next decade will reduce global poverty by one third. Conventional development projects recently proposed, although not approved, for the WRR are water theme parks and an information technology city. According to WRIDC, industrialization also means ancillarization with the development of downstream industry such as infrastructure and services although the organization recognizes that there is still the need for traditional industry i.e. agriculture. CEMSAP (1997) stresses the need to reconcile pro-environmental and pro-development goals but development in PU Calcutta has come to have two dimensions.

A planner pointed out that the role of the state is to regulate development so that it provides benefit to the largest number of people while at the same time minimizing social and environmental damage. There needs to be balance between maintaining rural and agricultural areas and livelihoods, and urbanization and industrialization, but conflict is inevitable in PU areas of rapidly expanding Asian cities. The conflict is especially marked in Calcutta which is the most densely populated city in India and which is in the second most densely populated state after Kerala. This is indicated by the population growth of Calcutta being less than that of West Bengal as a whole on a unit area basis. It was pointed out that Calcutta would have “exploded” had Salt lake City not been constructed in the wetlands.

The Government has to acquire land through compulsory purchase, as in other countries, as all projects require land but the market economy fails to address the need for land for development. The state intuitively selects land which would create the least resistance for development. No society can develop and go through the transition from a rural to an urban society without trauma. Unfortunately it is the poor who bear a disproportionate cost by change in land use so displaced persons need to be financially compensated adequately and timely, and assisted in finding new jobs.

4.3. Establishment of new townships

All stakeholders recognized the need to develop new urban / industrial townships but opposing viewpoints were location adjacent or near to Calcutta, such as Salt Lake City and the new township of Rajarhat, or at a distance from the city as satellite towns. Disputed points of view were the availability of suitable land to the south of Calcutta and to the west across the river as opposed to the northeast where Rajarhat is being constructed. Factors

involved in selection of Rajarhat more or less adjacent to Calcutta were access to the city's amenities and services, as well as proximity to the airport.

A third viewpoint was that the city should be expanded vertically rather than horizontally.

4.4. Land tenure, land use and livelihoods

The complexity of land tenure belies belief: private, government i.e. vested, cooperative and subjudice i.e. legally disputed ownership. It is further complicated by absentee ownership and leasing and subleasing from state and private sectors.

There is also apparently a difference between legal or formal and *de facto* or operational land holding. The system on the ground was reported to be more politically than legally determined.

The WRR has a large population estimated at up to 100,000 persons whose livelihoods depend on PU farming (wastewater-fed aquaculture and rice cultivation, and wastewater-fed and garbage-based vegetable cultivation), trading produce and sorting garbage. Furthermore, farmed produce provides low-cost food for Calcutta's poor.

One reason why fish raised in the WRR are relatively low-cost is because they are marketed as small fish of 250-300g size. This is a fortunate consequence of social problems: the need to net fish daily irrespective of size because of the need to keep possibly more labourers employed on fish farms than would be otherwise rational from an economic point of view; and widespread poaching of fish. Multiple stocking and harvesting fish generates additional employment of the poor through increased transportation of both fish seed and harvested fish. Were fish pond owners and lessees free to decide on the management of fish culture, they would likely produce fewer, larger and more valuable fish as in Andhra Pradesh with adverse consequences on the livelihoods of the poor.

One viewpoint is that the only feasible way to resolve the dilemma of tenure is for the Government to take over all land prior to the establishment of more rational and regulated land use.

4.5. Wastewater management

There is a conflict between the CMC, CMDA and in particular the DoIW, and the Fish Producers Association over the operation of the gates on the sewage canals. The CMA and CMDA are primarily concerned with drainage of the city, and the DoIW which manages the sewage canals determines when to open the gates at Bantala. According to the engineers, the gates are kept open to lower the level of sewage in the distribution canals to decrease the likelihood of the city flooding, to decrease siltation in city sewers and to reduce pressure on sewage pumps. However, this causes an inadequate supply of sewage to flow into fishponds.

According to several respondents, it is possible to manage an increased flow of sewage to

fish ponds, as was done in the past. Gates only need to be open for 10-15 days per year maximally during cyclones. Charging farmers for wastewater i.e. cost recovery, should lead to better resource management. It was recently recommended that the entire flow through the DWF channel should be distributed to the fishponds on payment, as far as practicable (DoE, 1999). Alternatively a CMC engineer recommended the construction of a sump at the start of the sewage outlets and installation of a pump to raise the level of sewage.

4.6. Fishpond labour

There is a conflict between the Fish Producers' Association which maintains that the ponds are overstaffed and the Labourers' Association which has negotiated a certain level of staffing. One respondent suggested an independent survey to determine what the current labour level is and the required or economic level as the employment profile in wastewater-fed ponds is politically determined.

If there were an increased supply of wastewater to the ponds, and they were desilted, these would increase fish production, possibly justifying the use of more labour.

4.7. Garbage disposal

The CMC is exploring alternatives for solid waste disposal such as incineration to reduce its volume. This would reduce the amount of organic matter for vegetable farming and adversely affect the livelihoods of farmers. However, it would reduce the growth of the landfill site at Dhapa which is expanding through filling in fishponds.

4.8. Environmental benefits

The WRR provides considerable environmental benefits to Calcutta such as a low-cost system of wastewater treatment, flood control through ponds storing floodwater, aquifer recharge and air purification. There is increasing awareness among planners and engineers of these environmental services although according to several respondents, CMC, CMDA and DoIW do not consider the role of fishponds in sewage treatment.

4.9. Governance

Inadequate governance is a major source of conflict, with little to no communication among stakeholders. Indiscriminate and illegal land use and encroachment on water bodies is taking place.

There is a plethora of planning bodies such as the CMC, CMDA, South 24 Parganas District and Salt Lake City in the WRR. Line agencies of the State Government are not yet integrated into the planning structure. Calcutta is among the least integrated cities in the world. Politics are also involved as municipal and state corporations are allied with different political parties. The City needs comprehensive governance for greater efficiency.

Planners have given attention to the City so farming, which is not the focus of the urban planner, has been ignored. Besides the City, planners have also given attention to remote rural areas as their need is greater than areas closer to the city. PU areas have been neglected and suffer as they are a “twilight zone”.

Government procedures have been circumvented on occasion with development proceeding without prior approval of the DoE and the DoF to fill in water bodies. Even government stakeholders have been left out of important planning exercises e.g. DoF was not represented on the DoE Committee for the Development and Management of the Calcutta Canal Systems and Wetlands (DoE, 1999) despite the importance of wastewater-fed aquaculture. According to HIDCO, 10-15 possible sites were considered in selecting Rajarhat for the new township but NGOs and the general public were not represented. Clearly, increased stakeholder participation in decision making is required to possibly defuse conflicts.

The courts and press are supportive of efforts to protect wetlands but NGOs feel that they have to contest every illegal development otherwise “it would open the floodgates” for developers.

Increasing social and environmental issues are a public issue although the NGO PUBLIC feels it is a “lost cause” to try to motivate the general public, targetting instead key professionals. This would appear to be a sensible strategy in view of the limited awareness of the Calcutta city residents of the issues facing the WRR.

A constituted wetland authority has been proposed for the conservation and sustainable use of the WRR, the “Wetland Conservation Authority” to be set up under the DoE (DoE, 1999).

5. Win-win situations

Three main win-win situations are outlined for groups of stakeholders currently in conflict:

5.1. Balanced development

Clearly it is not feasible to freeze urban and industrial development throughout PU Calcutta although good cases can be made for wise-use of wetlands through natural resource use in the WRR and also in large water bodies elsewhere. The overall benefit for the largest number of citizens of Calcutta and its PU area, including the poor, is likely to be through balanced growth of indigenous farming and waste reuse practice, and urban and industrial development in areas selected by all stakeholders.

Economic growth would create increased opportunities for rich and poor. People displaced by land acquisition should received adequate and timely financial compensation, and assistance in finding new jobs, requiring retraining if necessary. Displaced fishers could be employed in improved fisheries requiring increased levels of employment.

5.2. Desilting fishponds

Fish production is currently below potential because fishponds require desilting. Farmers lack financial resources (which is exacerbated by insecure tenure) to desilt ponds. Recently, a market demand has been created for silt as fill for the new township at Rajarhat, most of which is lowland interspersed with water bodies. The DoE supports legislation that preserves wetlands but believes there is a need to take a more strategic viewpoint as a missing link in the policy statement is a mechanism of how to preserve wetlands. The development of Rajarhat new town, which is outside the WRR, provided a means to simultaneously desilt fishponds and solve the problem of inadequate wastewater supply by diverting sewage from the new town. The DoF is seeking assistance to desilt the fishponds. HIDCO which is responsible for the development of Rajarhat, “will save the Wetlands by desludging them”.

5.3. Wastewater distribution

Increased supply of wastewater to the WRR fishponds would lead to higher fish production. Although used to subsidy, farmers should be willing-to-pay for wastewater, providing cost recovery to DoIW. Added benefits are possible higher levels of employment of pond labourers, seed providers, and market chain functionaries; and less pollution of the estuary with greater diversion and treatment of wastewater in fishponds, leading to recovery of estuarine fisheries.

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Appendix 1 - Outline of activities (ToR)

1. Meet with key actors/stakeholders* to discuss management and planning for peri-urban (PU) production systems.
 - define their role/responsibilities/influence
 - identify principles/planning framework/legislation/etc...that guides decision-making
 - give emphasis to issues relevant to PU farming: classification of activity, zoning, relevant legislation, references to PU farming in official documentation,
 - define the priority of PU farming with respect to other activities
 - elicit perceived constraints to PU farming
 - investigate initiatives to address these problems
 - discuss the perceived benefits of PU farming
 - discuss historical land-use change that has impacted on PU farming and discuss its future prospects in light of planning initiatives/state level development objectives e.g. more foreign investment
2. Describe the role of actors/stakeholders in managing PU natural resources and in guiding the formal land-use planning process, including their jurisdiction, sphere of influence and where they fit in the overall hierarchy. Also identify key committees/institutions that guide planning policy.
3. Develop the management/planning hierarchy to include landowners, leaseholders, cooperative management bodies and employees and their power, influence and roles
4. Assess the knowledge needs of key actors/stakeholders interviewed and the most appropriate pathways for disseminating project outputs i.e. workshop participation, technical reports, media communications
5. Assess the potential role of strengthened producer associations/ more informed advocates for the poor and local planners in developing appropriate management/development strategies for PU natural resources
6. Develop a work programme to assess systematically the priority assigned by different institutions to PU farming, the constraints and opportunities associated with these practice and strategies to manage and develop these systems equitably[†].
7. Produce back to office report detailing progress with the above activities

*Key actors/stakeholders

1. CMDA
2. HIDCO
3. WBIDC
4. CMC
5. DoIW
6. CMWSA
7. 24 Parganas Fish Farmers Association
8. DoE
9. DoF
10. South 24 Parganas District

†possibly a Delphi investigation (options and potential benefit to be discussed with S Bunting and Dr N Kundu during visit).

Appendix 2 - Itinerary and persons interviewed

- Monday 30 July
- Travel to Calcutta
 - Briefing by Dr. Nitai Kundu, Institute of Wetland Management and Ecological Design (IWMED), Dr. Madhumita Mukherjee, Department of Fisheries (DoF), Captain Bhery Fishermen's Cooperative Society, and S. Bunting
- Tuesday 31 July
- Field visit to Waste Recycling Region (WRR)
 - Ganesh Sapui, fishpond owner and lessee
 - Tushar Ghosh, Leader of Save the Wetlands Committee
 - Leader, Charcharia Fishermens' Cooperative
 - Suresh Kumar, Director, Land Records and Surveys, Government of West Bengal
 - Debashis Sen, Secretary, Calcutta Metropolitan Development Authority (CMDA)
- Wednesday 1 August
- Chandan Ray, Chief Engineer, Irrigation and Waterways Department, Government of West Bengal
 - Dr. T.S. Bandyopadhyay, Director, IWMED
 - Dr. M. Mukherjee, DoF
 - Nilotpal Datta, Committee to save Rajarhat
 - Field visit to Rajarhat
- Thursday 2 August
- Premotosh Ghosh, former Chairman of 24 Parganas Fish Producers Association
 - Shumon Sengupta, DFID Representative, West Bengal
 - Alapan Bandyopadhyay, District Magistrate, South 24 Parganas
- Friday 3 August
- Debashis Som, Municipal Commissioner, CMC
 - R. Das, Chief Engineer and Project Manager ADB/DFID Drainage and Sewage Treatment Project, CMC
 - Banani Kakkar, People United for Better Living in Calcutta (PUBLIC)
 - Field visit to Nune Bhery
 - Dr. Kiranmoy Nanda, Minister, DoF, Government of West Bengal
 - Mohit Bhattacharya, former Vice Chancellor, Burdwan University
 - Nalban Wetland Eco-Park and Watersports Company

- Saturday 4 August
- Botanical Garden of India
 - Agri-Horticultural Society of India
 - Das Gupta and Company Booksellers
 - Somnath Chatterjee, Chairman, West Bengal Industrial Development Corporation (WBIDC) and Member of Parliament
 - Goutam Deb, Minister, PHE and Housing Department, Government of West Bengal (HIDCO)
- Sunday 5 August
- - Field visits to Bamanghata village; new tanneries complex; Nalban; Ben Fish, Fisheries Cooperative Society; and Rajarhat
 - Basundhara Chatterjee, CIT Prayash Goodwill Welfare Society
- Monday 6 August
- Dr. Dhrubajyoti Ghosh, Senior Environmental Officer, Department of Environment, Government of West Bengal (telephone interview)
 - Debriefing with Dr. N. Kundu, Dr. M. Mukherjee and S. Bunting
 - Travel to Bangkok

Appendix 3 – Interview summaries

DFID Representative

Only the direction of CUSP had been established but not “what to do” and “how to do it” according to Shuman Sengupta, DFID Representative, West Bengal. The programme area is to be that of the Calcutta Municipal Corporation, CMC (which includes 25% of the WRR). Wastewater treatment and reuse, and solid waste management could be included in CUSP as these also involve “local economic development”. It was felt that the current project could inform the CUSP and Stuart Bunting was invited to a meeting the following week at which livelihoods would be discussed for both rural and urban areas of CMC.

Calcutta Metropolitan Development Authority (CMDA)

- The CMDA is responsible for land use and planning policy for the entire 1,380 km² area of the Calcutta Metropolitan Area (CMA). It was the main player behind the construction of the Eastern Metropolitan Bypass and East Calcutta and Baisnabaghata – Patuli Townships (Kumar, 2000)
- The CMDA has a deep association with DFID and the consultants for CUSP, once appointed, will work with a local task team comprising government departments, the Chamber of Commerce, NGOs etc. CEMPSAP is now dated. DFID now recognises that the economic component needs to have a broader intervention than at household level as earlier initiatives got into trouble with credit and marketing etc. There is a need for a holistic model involving macrolevel as well as microlevel.
- The wetlands would not have been preserved without NGO pressure even though there are laws against filling them in, which happens daily. However, there is a need to consider short as well as long term goals because the immediate economic pressure is so great which is why the wetlands are threatened. Pressure is particularly acute in West Bengal which is the second most densely populated state after Kerala, although the Calcutta area is the most densely populated in India.
- In response to the question of where should Calcutta develop? It was stated that the wetlands cannot be touched and the city cannot grow further but there is need for a solution. The pressure on CMDA is so great that even they seek “land” to be developed from unregistered water bodies. An example was given to illustrate the magnitude of the problem: a water body in a small town was the only available area for the construction of a wastewater treatment plant; the DoE gave approval on the condition that CMDA built an artificial wetland to replace the lost waterbody but they had to renege on the agreement as there was no other land available.
- The LUDCP has been completed for Calcutta city and many municipalities. The WRR is covered by legislation that prohibits development. The Dimple Vincom Company which wished to build an aquatic theme park in Nune Bheri approached the CMDA but the project was not approved as it would have been illegal, even though it is just outside the WRR. However, the CMDA would have liked to have approved it as there are a

- few theme parks already and they provide economic benefit.
- In response to a question about the role of wetlands in sewage treatment, it was pointed out that all sewage has to be treated now according to the Ganga Action Plan. Where to treat sewage is a problem as there is no land in cities and even more land is now required for treatment as coliforms as well as BOD have to be considered. There is huge economic cost implications but citizens are not yet willing to pay for sewage treatment; they are not concerned about the environment which they regard as “government business”. Perhaps they would be willing to pay if there was a more direct link to them.
 - CMDA realizes the need to conserve wetlands and that there is a limit to encroachment before the WRR ceases to function as a viable entity. The outer ring railway and Dhappa by-pass road will be developed outside the WRR although consideration is being given to putting roads on pillars across the WRR. There is a need to create stakes and economic benefits in conservation. New developments will take place further to the east, excluding the WRR.
 - The city is the primary concern of the CMDA, keeping it clean and upgrading facilities including drainage. However, people need to derive economic benefit.
 - A major concern of the CMDA is provision of fill for the new township at Rajarhat. Salt Lake City was filled using silt from the Hoogly river at high cost although it was subsidised by The World Bank. Possible alternatives are distant transport of fly ash from thermal power plants and desilting ponds in the wetlands. Fly ash is free although there would be a high transportation cost. There is a need to find a cheap way of transporting silt from the wetlands. It is feasible from Nalban which is nearby the road but many ponds are distant.

Calcutta Metropolitan Corporation (CMC)

- The sewers and canals were built by the British but the latter are now occupied by squatters and are silted and choked so there is backflow. There is an ADB (\$250 million)/DFID (£28.4 million) joint project on drainage and sewerage, including sewage treatment. The total cost is \$400 million with loan signing in September 2001. Preliminary work has started. The methods to be used will be decided by consultants and city engineers. Land will be acquired to build sewage treatment plants.
- The Wetlands are to be maintained by law. However, the landfill site is adjacent and solid waste disposal is expanding at the cost of wetland through filling in fishponds. The city is exploring alternatives for solid waste disposal and incineration is a possibility because of the high calorific value of the waste.
- Consumers in Calcutta are aware of the sources of their fish and vegetables and some look for alternative supplies.
- As the wetlands have lots of economic activities such as vegetable and fish production, the CMC is not happy with the state of the wetlands. Besides the landfill site there are polluting small factories and the tanneries, although the tanneries will move to a new

site under construction.

- The wetlands could have been a tourist site for ecology.
- Unfortunately, all economic activity is centred on Calcutta and the pressure, illegal transfer of land and construction are of concern. The CMC frequently receives complaints that land is being filled from the land records department, NGOs and the public. As filling natural ponds leads to flooding, the CMC wants to protect them and some are large. It is useful for cities to have ecological balance. The temperature would rise if everywhere was built up.
- CMC currently does not have a sewage treatment plant and the value of natural treatment in the wetlands is appreciated. There is concern about public health from vegetables grown on garbage and raw sewage which is currently being studied by DoE. However, fish quality is good because the BOD₅ in raw sewage falls from 195-250 to 20-29 mg/l after treatment in fishponds.
- There is no major sewage treatment in Calcutta at present although two small plants have been built in the CMC: a mechanically aerated system at Garden Ridge; and a stabilization pond series at Behala East under construction. The Banjar treatment plant in South Dum Dum municipality is activated sludge. The CMDA initially went for mechanical treatment but found it too costly which is why their second plant will be ponds. The main problem with low-cost sewage treatment is availability of land although this is not a problem in the wetlands.
- The WRR provides employment for 30,000 people, 15,000 tonnes fish /year, and 32,000 tonnes vegetables/year in addition to treating Calcutta's sewage. Without the WRR Calcutta would not survive as it treats the sewage.
- The World Bank is carrying out a study for the main city and want some kind of sewage treatment, at least primary treatment at Bantala and the diversion of the entire dry weather flow to fishponds. Even if the consultants don't recommend aquaculture, the city engineers will.
- Dangerous levels of Cr of 5,000 mg/kg have been found in silt in the outflow channel. Even with the relocation of the tanneries, the leachate into ground water is of concern.
- Rajarhat is to have a sewage treatment plant and the Chief Secretary of West Bengal suggested in a meeting that it should be natural as far as possible.
- Calcutta needed a new township and it had to be near to Calcutta. Silt from fishponds can be used to fill the site as his house is constructed on a filled in bheri. However, the ground floor is damp and iron fittings rust so there is need for a damp course.
- HIDCO is exploring desilting Tolly's Nully by DoIW for Rajarhat but there is a problem of transportation. A dredger cannot be purchased as it is too shallow. Dredging of canals is mainly manual as they cannot be dried.
- If the water level is maintained at too high a level in the sewage outlet canals, there is

pressure on the pumps and increased siltation in the sewers. A sump could be built at the start of the sewage outlets and pumps installed to raise the level in the DWF canal.

South 24 Parganas District

- The District Magistrate is the chief government official of the district, with the official title of Magistrate and Collector. These two roles were merged in the 1770s but the post now has many roles, including development. With a population of 1 crore (10 million), larger than some European countries, the District is not well equipped and planning is mainly carried out by the CMDA and the CMC, with some input from district staff. The role of the District Planning Committee is therefore indirect.
- The primary concern of the District is law and order as it is congested with high rates of poverty and crime. Water bodies are controlled by antisocial elements. The District is also a victim of poor infrastructure and low policing.
- There is a plethora of planning bodies concerned with planning urbanisation: the Calcutta Metropolitan Corporation (CMC) established by the CMC Act of 1980 with an elected Major; the CMDA established in 1971 to handle the question of PU development, which does not have the people's mandate as it is not elected and not local government but it is well equipped; the Calcutta Improvement Trust (CIT) established when the capital was moved to New Delhi, which was merged with CMDA but sometimes functions separately; and the defunct Metropolitan Planning Committee with efforts currently being made to re-establish it. The line agencies of the State Government are not yet integrated into the planning structure and PU planning is a victim of this. Drainage also is a problem as it is under several agencies as are roads for which there is still not a comprehensive master plan. Calcutta is among the least integrated cities in the world. The city needs comprehensive governance for greater efficiency.
- The emphasis of the District Planning Committee lies in the remoter rural areas as their need is the greatest so PU areas have suffered. Since farming is not the focus for the urban planner, it has been ignored. As the city has expanded, the poor have suffered disproportionately on being displaced as the city has acquired land.
- There should be better management of PU areas as the Government has lost its way. Planners have given attention to the city and remote rural areas but have neglected the PU "twilight zone". A recent study revealed a higher human development index in a remote village in the District than one near Calcutta.
- Urbanization and industrialization are required but there needs to be a balance. As all projects require land, there should be more studies on the costs of urbanization. Furthermore, there needs to be adequate compensation for displaced persons when the state acquires land as the market economy fails to address the need for land for development. However, any state will intuitively select land which would create the least resistance for development.
- The issue of development without trauma was discussed. Can any society be developed without trauma of transition from a rural to an urban society? If Salt Lake city had not

been developed, Calcutta would have “exploded”. However, the costs borne by the poor need to be reduced. Farmers are provided with compensation six times greater than their annual salary, although they are not guaranteed a new job which is also not the practice in other countries. The labour law states that displaced people should be given priority for new jobs created but the government cannot fulfil the promise.

- Development involves not only pitting the rich against the poor but also the poor against the poor e.g. by not relocating squatter settlements that have encroached on canals, continued flooding of large areas also affects large numbers of poor farmers.

West Bengal Industrial Development Corporation (WBIDC)

- WBIDC is having problems over wetlands. The corporation does not want to disturb the ecology as once an area has been described as a wetland it cannot legally be disturbed.
- However, the definition of wetland is “not clear”. Millions of Rupees have been spent and lost because people have purchased land without being aware that they could not develop it.
- WBIDC disputes the current definition of a wetland. There is not a “properly defined concept of wetland” because the current one was introduced by “overzealous officers”. We should proceed “in accordance with expert opinion but it should not be overly restrictive”.
- The City needs an environmental long term vision as it would be finished environmentally if 20 factories were built close by.
- WBIDC “does not want to spoil the wetlands which are used for sewage treatment” but they are “too protected by overzealous people”. WBIDC would like “expert opinion” from this study.
- Concerning criteria for urban and industrial development, it is not so easy to disperse people from the city as they do not wish to move far away because of a lack of educational and recreational facilities.
- Calcutta could not develop to the west because of the river, nor to the north or south which are already developed. The only place to go was to the east which is the reason the Government decided on Rajarhat for the main area of new development which will have self contained infrastructure.
- It has also been decided to build a third satellite township (after Salt Lake City and Rajarhat) at Dankuni 15-20 km west cross the new bridge as it is already an industrial area. Attempts are currently underway to acquire 400 acres for the new township there.
- Urbanisation is taking place in India whether people like it or not because of an expanding middle class and increased awareness through TV.

- As India has a large population there is need for best use of land. The rural economy is strong and 90% of the people on the streets of Calcutta are from out of the State. There has been tremendous development of agro-based industries (the jute industry is in trouble because of competition from synthetic fibres). WBIDC is keen to develop agriculture-based industry because it keeps people in the rural area. It is proud that so many people are usefully occupied in rural areas with tractors having replaced bullocks on 60-70% of the land, the development of small-scale irrigation, and increasing use of submersible pumps allowing farmers to raise two crops and even think about raising three crops a year. However, there is a saturation limit with a growing population.
- There are now more Hindi than Bengali speakers in Calcutta. Bengalis seek white collar jobs in education and science and shun business which is an adventure as they are not keen to take risk. India has five Nobel prize winners, all from Calcutta. However, the situation is now changing as jobs are becoming scarce e.g. West Bengal is doing well in IT with 14,000 people employed to date. Industry also means ancillarization such as downstream industries, infrastructure and service. However, there is still the need for traditional industry i.e. agriculture.
- Concerning effluent policy, WBICO tried with solid waste management through a USA based biomass company to produce power but it failed because they did not have the technology. There is limited land for fill although some solid waste is used to make compost.
- A decision has also been taken to move the tanneries and build the Calcutta Leather Complex with a common treatment plant, the largest complex in Asia, with World Bank and Asia Development Bank loans.

PHE and Housing Department (HIDCO)

- HIDCO will desilt the wetlands. The Minister of Fisheries has already agreed that silt can be removed from the fishponds. A trial has been carried out in desludging two to three large wetlands on the other side of Nalban. Increasing the water depth from 0.45-1.5 m tripled fish production. HIDCO is willing to dig all the wetlands but financial support is required as the State Government has insufficient funds.
- The State would never have enough money to desilt the bheris unless it were linked with the new township at Rajarhat.
- The Government position is not to develop the wetlands. However, the real estate people want to grab the wetlands, drain them and sell them. However, HIDCO will save the wetlands by desludging them.
- A second issue is sewage supply. The new township will also feed the northern part of the WRR and thereby kill two birds with one stone. However, it will require huge expenditure to provide channels and pumps. Financial assistance is again needed although a soft loan would suffice.
- HIDCO has been informed by fishers that their income falls and they earn only Rs

50/day as the fish catch is low unless there is sufficient sewage.

- Kalyani PHED has built an integrated sewage treatment and reuse system comprising a series of ponds with fish in the later ponds in the series, under the Ganga Action Plan. It's also a popular picnic spot.
- In selecting Rajarhat for the new township, 10-15 urban growth centres were considered. However, it was not possible to develop the new township to the south or north as they were already fully developed, to the west because of the river, or to the east because of the Wetlands. There was only one possible area left for development, to the northeast beyond the wetlands at Rajarhat.
- Rajarhat is located just outside the WRR. As the yields of monocropped rice were low compared to the rest of the State with double and triple cropped rice, it was easier to negotiate with the farmers.
- Farming households were compensated at Rs 10,000-15,000 / catah, giving each Rs 200,000-300,000 as households farmed 10-50 catahs.
- One member of each family, either boys or girls, and with limited skills, have been formed into cooperatives of 10-15 persons and awarded jobs.
- Training programmes are also being provided for local youths so that they will have skills for employment in the new township.
- It is a model project for India. Committees were formed with local panchayats and people came voluntarily with their papers to sell land without the need to invoke direct purchase. There was no forced acquisition of land and no violence. Even villages outside the project area are being integrated with peripheral development of roads, electricity and schools.
- The macrolevel planning exercise revealed that most possible areas for the new township were far from Calcutta (30-50 to 100 km) so it is feasible to build district townships. In West Bengal 30 % of the population is urban, and out of the urban population, 70% is in Calcutta with only 30% being in the rest of the State. However, over the last 20 years the increase in the urban population in the CMC area has been less than in district towns, indicating district level town urbanization.
- There is a need to consider the uniqueness of the Calcutta area:
 - 1 million refugees from East Pakistan following partition
 - then Bengali speakers a majority but as Calcutta is the hub of eastern India with considerable immigration, they are now a minority
 - provisional data from the 2001 census indicate that West Bengal is the most densely populated state in India
 - no fallow land

- for historical reasons the State is totally one-city based, and it would be difficult to decentralise 200 years of growth.
- Rajarhat was also chosen because of the natural expansion of urbanization as revealed by State Government satellite pictures taken with a 10 m² grid in 1961, 1971 and 1981. Planned urban development for the new town would be worse than unplanned development.
- The project has been encouraged by the Chief Minister of West Bengal not to use State funds and Rs 400 crores have already been raised from the public.
- The main problem identified at the start of the project was drainage and added stormwater flow has been taken into account.

Department of Environment, (DoE)

- The DoE is responsible for environmental clearance for new urban and industrial development through the recently established Pollution Control Board (PCB). It also has the task of monitoring industrial effluents.
- The DoE view regarding PU development in general, and the WRR in particular is that existing wetlands should be preserved. However, there is a need to take a more strategic viewpoint as the missing link in the policy statement is how to preserve wetlands? Problems of inadequate wastewater supply to fishponds and their siltation need to be resolved. The NEDECO report on the reclamation of the wastewater-fed fishponds for construction of Salt Lake City pointed out that there was no provision for displaced poor fishers. It recommended that the north sewage fed fisheries should be desilted to accommodate the displaced fishers. Thus, desiltation of fishponds is not a new idea but it only became reality when Rajarhat new town came up in response to market forces.
- The role of the State is to minimize damage and regulate development to benefit the largest number of people. As land is very valuable, the Government should monitor the process and be supported by public opinion.
- Although 30 water bodies have already been filled in for the development of Rajarhat new township, the largest natural wetland is Dhurba Bill. According to the 1971 topographical map it was 2,000 ha in area but satellite images taken in dry and rainy seasons indicate an area now of only about 500 ha. It is silting up rapidly because it is not well managed and is under a lot of pressure. The upper margins are cultivated in the dry season, leading to erosion in the rainy season with increased rates of siltation and eutrophication.
- According to the law, the PCB has to investigate all complaints concerning changes of use of wetlands. Complaints have even been received during construction to widen roads when borrow pits rather than wetlands were being filled in. Even the fishers in the WRR want improved infrastructure but this is opposed by NGOs.

- The DoIW believes its responsibility lies only with draining wastewater (and storm water) from the city and not distributing it to fishponds. It is not true that a higher level of wastewater cannot be maintained at Topsia Point A and Dhapa Lock because of technical reasons (increased siltation rate of sewers and increased pressure on pumps). Higher levels of 8.5-9 feet were maintained from 1945 until 4-5 years ago.
- It will be easy to channel more sewage to the south of the WRR as the siphons were repaired last year to increase the flow of sewage. A project will be implemented soon to monitor flow rates along the entire 62 km drainage route.
- A Government order was introduced which declares void any transfer of land and change of land use since 1992 so it should be feasible to increase wastewater reuse in the south of the WRR.
- The WRR is about to be declared an International Ramsar Wetland Site with support of both Government of West Bengal and Government of India.
- A constituted wetland authority is required to manage the WRR.
- A major constraint is the lack of public interest in the East Calcutta Wetlands as a recent Birmingham University survey revealed that 99% of Calcutta City residents were unaware of its existence.

Institute of Wetland Management and Ecological Design (IWMED)

- There has been a recent drastic change in West Bengal state policy with the newly appointed Chief Minister of West Bengal stating that there should be no more filling in of wetlands.
- The people in rural areas will benefit from the change in government policy with the DoF interested in developing the wetlands for fishing to provide employment.
- A map is required to support the move to obtain Ramsar site status for the WRR. The “legal” map for the WRR is the original map prepared for the WRR which was used in the 1992 court ruling case. IWMED is the referable agency for the WRR.
- The question of the farmers paying for sewage to increase the supply was discussed. Farmers may not be willing-to-pay for sewage as they are used to getting it free. In West Bengal the population is used to subsidies and even water is provided free. Another possible constraint is consumer attitudes because the image of wastewater-fed aquaculture may be raised if sewage is to be sold.
- There is concern over public health aspects of wastewater and garbage reuse. Although levels for heavy metals are within acceptable limits, there may be accumulation within humans because of daily consumption of produce. IWMED will soon publish a study of heavy metals in Dhapa vegetables. Published levels in earlier studies were in dry wet although we consume vegetables fresh and so gave the impression of much higher levels of consumption of heavy metals relative to acceptable limits than is the case.

Expressing data on a fresh weight basis reveals that consumption of Pb, Cr, Cd and Hg in vegetables is << acceptable weekly intake.

Department of Fisheries (DoF)

- The position of the DoF is clear, that water bodies should not be filled in. A law was enacted in 1984 to protect all water bodies in the State, with two subsequent amendments, the most recent with provisions for a Rs 200,000 penalty and a 6 months jail sentence for illegally filling in water bodies >350 m² (5 catas). The awareness of the people has been created and police are required to enforce the law.
- The WRR provides a low-cost system of wastewater treatment, a supply of relatively low cost fish, employment, flood control, aquifer recharge and air purification.
- Local people have been consuming wastewater-fed fish for >100 years and there has not been a single case of a health hazard as the fish are consumed after being cooked well. Industry has been stopped from polluting domestic wastewater with industrial effluents e.g. the tanneries have been moved.
- There have been national and international conferences on wastewater-fed fisheries and wetlands. The WRR is a model and it is essential to document the experience, not only for Calcutta but for the world. DoF will cooperate fully in any project with such an aim.
- “Some unscrupulous persons” are trying to destroy water bodies but the DoF resists developers with many successful cases. The DoF forms fisheries cooperative societies in vested water bodies belonging to the State and fishers groups in privately owned water bodies. This is the first time that co-sharing (*barga*) groups have been established in fisheries although they occur in paddy fields. Fishing rights are handed over to the group for 25 years.
- One example of the establishment of a fishers group is Nune Bheri, adjacent to Captain Bheri, which is within the WRR. All agencies and the DoE gave permission to the Dimple Vincom Company to construct a water theme park, except the DoF which was able to maintain the fishery. It was erroneously claimed that Nune Bheri was a lowland rather than a wetland and had neither wastewater inlets nor outlets. The 57 fishers have been organized into a group by DoF and assigned a registration number. Part of the fishery area is private, part is vested.
- A second example of DoF organizing a fishers group is Padmapukur wetland in Dum Dum, with lots of fish species where developers plan to build an engineering college and housing units. Currently the case is subjudice in the Calcutta High Court.
- The Rajarhat township development is proceeding with 30 ponds already filled despite the DoF refusing permission. Also of concern to the DoF is the proposed filling in of Dhupir Bill, a seasonally flooding area with 53 species of fish identified, which is used

to farm rice in the dry season. DoF proposed the construction of a 275 ha wetland “museum” at Rajarhat, the “Wetland Wonder World Museum”, to HIDCO in 1999 but without a reply.

- The DoF would like to enhance the economic viability of the fisheries to show that indigenous systems of natural resource use have potential for sustainable livelihoods of Indians, 70% of whom still live in villages. The DoF views employment through use of natural resources as a viable alternative to the Western development model of large cities and industrialisation.
- As the wastewater-fed fishponds are very shallow, the DoF will prepare a project to dig them to a depth of 2 m to increase production by a factor of three. Local banks, World Bank and Asian Development Bank will be approached.
- The new DoF budget for the current year has Rs 50 crores for reclamation of large water bodies throughout the State (40,000 ha total including 4,000 ha of wastewater-fed ponds). Silt will be used to strengthen embankments and increase agricultural production in adjacent areas. Deeper ponds will also serve to provide flood protection and recharge aquifers.
- The DoF has already discussed with CMC and DoIW about setting up a pumping system to supply feeder canals to overcome the problem of inadequate supply of wastewater to the fishponds from June to September when they are unwilling to close the lock gates. DoF staff have already been given instructions to prepare a proposal.
- The DoF has not given any clearances to fill in water bodies, with ultimate clearance from DoE. Only the DoF among government agencies protects water bodies. The IW MED was set up by the DoF in 1986 although it is now under the DoE. The DoF also established a Wetland Day, the 16th June.
- There is lack of coordination among government agencies e.g. DoF was not represented on CEMSAP. There should be better coordinator among agencies.
- Another development proposed for the WRR is a 5,000 acre area in the centre in Tardah - Kapatathi village of Bhangar block in 24 Parganas South district, “Lakeland Village” which is in reality a township for an information technology city. The project, proposed by Chatterjee Industrial Development Company, one of the major real estate agents, may not take place (www.ecopost.org). One large bheri has already been sold for Lakeland Village but it will not be cleared by the DoF.

Department of Irrigation and Waterways (DoIW)

- The DoIW has a role to play as it manages the wastewater drainage canals.
- As the drainage of Calcutta is to the east, the wetlands have value in moderating flooding. Urbanisation of the eastern fringe adversely affects drainage. The DoIW is blamed when there is flooding in the city due to illegal filling in of wetlands.

- There is a need to mobilize people to prevent illegal development
- Water levels in canals are varied through controlling the gates at Topsia Point A and Bantala. At Bantala there is a good relationship between the fishers and the DoIW although the levels maintained may not be adequate for the fishers and be at cross purposes. Levels are established locally at Bantala.
- A major impediment is the tide which causes a tidal lock for 5-7 hours in every 12 hours on the SWC at Bantala. The locks are opened on ebb tides. Fishers need to understand the timing. There is a Ford Foundation paper on the drainage of Calcutta.
- Siltation of the sewage canals is a problem as all tidal rivers tend to silt but much of the deposited silt is washed out during the monsoon period. Massive efforts are being carried out to desilt canals with annual expenditure of Rs 200-250 crores.
- As West Bengal is a densely populated state dumping of silt is a problem
- With the development of the Rajarhat township, many fisheries are being desilted and the silt carried to the township. The silt cannot be removed as a slurry but is dug out and transported in April and May when the pond sediments are dry.

Department of Land Records and Surveys (DoLRS)

- The Department merely records what use is made of land and who owns it.
- Regarding the WRR the Department was ordered by the Calcutta High Court not to record any changes in land title or use as a court order prohibited changes in land use. However, the Department has no specific mandate regarding the WRR, only with property.
- The State criteria for land classification are well defined for mapping purposes.
- If unauthorized land use is brought to the attention of the Department, they notify the Pollution Control Board (DoE).
- Rajarhat township is being developed on normal land and not wetland as was Salt Lake City.
- Development cannot just encroach on wetlands as several groups watch and report.

Pond owner and lessee

- The main problem is inadequate sewage supply as the DoIW manages the canals and determines when to open the gates. One of the main reasons for forming the “Save the Wetland Committee” which comprises pond owners, pond lessees and pond workers, is to request the Minister of the Environment to provide more sewage.

- The quality of sewage has also gone down as cattle have been removed from city streets, leading to fewer nutrients. However, this can be compensated for if the supply is adequate
- The pond depth is only 0.75-0.90 m whereas 1.1-1.2 m would be better. He lacks capital to desilt and to pay wages during desilting when there would be no fish production. Also the land is subjudice. The National Bank for Rural Development has plenty of money but he cannot obtain adequate loans. However, he plans to desilt his ponds one at a time. There is a market demand for silt for land fill at Rs 50 per 200 feet³ although this price is not enough to cover the cost of desiltation.
- There is a labour problem but it is improving as the Labourers Association now understands the need to dialogue with the Producers Association. All are united under the Committee which aims to motivate the public and to articulate their demands into the decision making process and inform government.
- The owner of one of his ponds (three of his ponds are leased) is a doctor with a sports club connection who would like to introduce water sports. This would improve profitability, create more oxygen for fish and lead to building a new road as some development of infrastructure would improve the efficiency of aquaculture as a business.
- In answer to the question of why do they not produce only large Indian major carps as in Andhra Pradesh (small and large fish fetch Rs 30 and 40-50/kg, respectively), the producers are compelled to use 1 labourer / acre or pay the equivalent. Thus, they have to net fish everyday, irrespective of fish size.

Charcharia Fisheries Cooperative

- The Cooperative, established in 1986 covers 55 ha (two large ponds of about 27 ha each and many small ponds). 184 people are employed (150 fishers and 34 fish transporters). In addition there are 16 labourers who are not members of the cooperative but who work on a commission basis (20% of catch).
- Previously the land was privately owned but as it was over the land ceiling it was vested. 30 years ago only 4 families owned ponds in the area. There was a major struggle between 1967 and 1969 when the fishers formed a united front and the government redistributed the land. After 1978, land previously missed was vested.
- There are about 18 large farms and 200 small, 0.4-0.8 ha, family owned ponds in the area but not all the latter are able to receive sewage. Within the entire WRR there may be about 400 small, household level fish farms.
- Two large fisheries in the area, 480 and 320 ha, were taken over by the Government, declared vested, and the land was redistributed. Each household received about 0.4-0.6 ha and started to cultivate rice but later they converted to fish farms.
- The Cooperative leader reported only one problem: while sewage is available, the

management by the DoIW is problematic. They have offered to help the DoIW to manage the water gates.

- It is possible to pump sewage but it is costly. However, the DoF is paying for 6 large pumps in the WRR with 1 installed in the area. Farms will pay for operational costs based on pond area.
- Siltation of ponds is also a problem and a huge amount of money would be required for desiltation. Another issue is whether there is inadequate infrastructure such as roads for silt transportation. A small area would need to be developed for infrastructure but PUBLIC would oppose it.
- Labour levels were not considered to be excessive and it was further pointed out that laborers only work 4 hours / day.

Fish farmer, Bamanghata village

- The farmer interviewed was one of about 150 households in the village who were not members of the adjacent Charcharia Fisheries Cooperative. There could have been about 200 ponds in the village as households had 1-3 ponds although not all ponds could be supplied with sewage. The farmer interviewed had 0.8 ha with a single pond of <0.4 ha. The landholdings were traditional, having been passed down from his father and grandfather and were not redistributed land. There is another similar village in the area.
- The farmer previously used the wastewater-fed pond for washing and domestic purposes but now has a tube well.

Fish Producers Association

- The wastewater-fed fisheries began on a commercial basis around 1927-1930. In the Dhapa Square Mile, the elongated areas between the garbage piles filled up with rainwater and spawn were almost certainly stocked in the last century. However, the nuna bheries were saline and Indian major carps could not be cultured there until there was a supply of sewage provided in canals.
- The most economic way to grow fish depends on the size of the ponds. With smaller ponds of 5-7 ha it is best to grow fish to 0.25 kg but in larger 30-60 ha ponds fish should be harvested not less than 1 kg.
- The main reason for harvesting small fish is poaching.
- Growth as well as market price is considered when stocking fish. Silver carp is stocked because it grows so fast. Mrigal is the most productive IMC.
- The DoIW do not like to close the gates to raise the sewage levels because it interferes with the flow. They are not interested in the supply of sewage to the farms. Not only

the DoIW but also the CMDA do not consider the role of fishponds in sewage treatment.

- The pond owners perform a role in wastewater treatment so why should they pay for sewage. He appreciated the suggestion that DoIW would supply more sewage if farmers paid a little and actually took the initiative when President of the Fish Producers Association and collected money for DoIW. It is possible to manage an increased supply of sewage to the farms without hurting the city. He set up a committee of all stakeholders and for 1 year it ran successfully which proves that it can be managed. However it failed because of noncooperation from DoIW. Both gates at Topsia Point A and Bantala were managed better.
- During cyclones the gates need to be open, but for 10-15 days / year maximum. The problem is Saturday and Sunday is a holiday and the gate operators won't operate the gates when the engineers are absent Saturday, Sunday, up till 10 am Monday. When the gates are eventually closed it takes at least 1 day to raise the level of sewage. Therefore in 1 week farmers get sewage for only 3 days and not for 4 days.
- There are two kinds of workers, ones who are loyal and work, and ones who agitate rather than working. He agrees that 1 worker / acre paid Rs 50/day would be good providing that there were a regular supply of sewage and the ponds were desilted so that fish production would be at a good level. There should not be >1 worker / acre. Now there are 10,000 workers.
- It is not true what the cooperative says that workers are paid Rs 50/day (they actually said Rs 45-65) but only Rs 30-35 / day. It is also not true that the labour level is always 1 worker/acre as through the Union agreement, as sometimes they demand more than 1 worker/acre. This is not viable for smaller bheris. He recommended that an independent survey be carried out to suggest what it is.
- Desiltation of ponds can be integrated with HIDCO who are now desilting 2-3 ponds near Rajarhat. Silt is removed moist by crane and truck for 5 months (Dec-April), 1 month after ponds are dewatered in November. Dikes can be renovated and widened at the same time with the silt given free of charge for being removed.

Nalban Fish Farm

- The 176 ha farm belonging to DoF comprises 161 ha of ponds: 4 large grow-out ponds of 120 ha, 30 ha, 4.14 ha and 3.42 ha; and 14 nursery ponds, total area 3.55 ha.
- Production is in three stages, two nursery and one grow-out, with fish transferred between ponds.
- The 120 ha pond is currently being desilted with 70% of digging to 1.5 m depth completed. Work began in November 1999 but ceases during the monsoon from end of May to October-November as silt is excavated by machinery when the pond has been drained. Work is expected to finish by March-April. The excavation company is providing Rs 400,000 / month to cover the salaries of the 154 staff to cover loss of

money from fishing.

- Up to 1999 the farm was not getting enough sewage but the problem was resolved after a meeting with the Salt Lake City council under whose jurisdiction the farms lies. The council agreed to channel sewage to the farm twice / week.

Save the Wetlands Committee, Leader

- The Committee was established in November 2000 to save the livelihoods of the 100,00 people engaged directly or indirectly in the wetlands.
- It aims also to obtain funding or assistance to desilt the ponds as an increase in water depth of 20% would lead to a three times increase in production. This would then provide even more employment.
- The supply of sewage from the city is adequate but the way it is managed by municipal authorities is a problem.
- There is also concern that pollution by sewage in the estuary is adversely affecting harvests of fish and shrimp, which would be positively impacted by increased diversion of sewage to fishponds.
- Silt removed from ponds could be used to repair dikes but also for fill in new townships. Negotiations between the Committee (the leader, some pond owners and union leaders) and HIDCO have already taken place on three occasions and three large fisheries have already been desilted. HIDCO pays Rs 12,000 / pond worker / year *in lieu* of income from fish farming when the ponds are being desilted. The market price of silt is Rs100 / truck (300 feet³)
- The level of staffing of the fishponds has been agreed by the Producers Association and the Labour Union at 1 labourer / acre. Fisheries cooperatives have estimated this rate as optimal and use even more. If the ponds were desilted then the labour intensity could be increased.
- Labourers are paid from Rs 45 to 60 / day with a Rs 2,000 – 4,000 bonus during the October Puja (?) festival and Rs 100-200 for small festivals. Laborers are also given fish and clothes on some occasions. Furthermore, workers in cooperatives receive dividends.
- There is sufficient land for development but it should not take place in the wetlands which provide natural purification of sewage and clean air.
- With respect to activities besides fish culture, relatively few vegetables are raised on the dikes because of cattle and goats but they could be managed better.

- The issue of why larger fish with a higher market value are not raised in the wetlands as in Andhra Pradesh was discussed. The reason is that the level of employment is higher in the wetlands. Multiple stocking and multiple harvesting of 100g fish provides livelihoods for large numbers of people. Employment is lower in Andhra Pradesh where it takes 1.5 years to culture Indian major carps to >1 kg.
- The current strategy in the wetlands is the best for poor people – globalisation and competition are required but there is also a need to take care of people. The proposed Lakeland Village project was raised as an example. While compensation would be given, a different type of development would take place and the rural poor would be deprived of a living.

Non-government organizations

People United for Better Living in Calcutta (PUBLIC)

- Responsible for the 1993 Calcutta High Court freeze on the WRR.
- PUBLIC does not try to motivate and activate the general public which it feels is a “lost cause” but aims at key professionals. A recent activity was to organise a HASH around the bheris.
- It “feels it has to fight them all otherwise it would open the flood gates” e.g., small wetlands such as Nune Bheri.
- The courts are supportive as they haven’t had a single bad judgement, as is the press.
- Smaller NGOs all over the State are now fighting for wetlands – at first even the court asked “what is a wetland”?
- Ganga Action Plan is also now considering wastewater-fed fisheries.
- Fishpond owners believe that the DoIW has a deliberate plot to keep sewage levels low to “starve them out”.
- There is plenty of land for development across the new bridge in Howrah but the WBIDC wants to develop land near the airport e.g. the proposal to build a World Trade Centre in the WRR

Committee to Save Rajarhat

- There used to be fisheries cooperative societies in the Salt Lake area but the 30,000 fishers are now mostly begging and rickshaw pullers.
- According to the HIDCO promotional brochure, Rajarhat is 10 km from Calcutta’s central business district. It is described as “New Calcutta, a planned, integrated eco-friendly complete city” with housing for 0.5 million people from very low to 2,750 ha of “vacant / low yield agricultural land” and “no fishery or permanent waterbody in the project area” and it is “outside the Calcutta Wetland and Waste Recycling Region”.

The development proposes 1,310 ha of large lakes, water bodies and open green areas.

- In the West Bengal Pollution Control Board, “Application for Consent to Establish (NOC)” form, under Question 2.5 “Present nature of land: fallow, agriculture, forest, residential, coastal”, there is no wetlands category. This could be interpreted as being absent because it is against the law to develop it. The application form had the word “vacant” hand written over “agriculture”. Note that NOC stands for “no objection certificate”.
- The farmers are to be compensated at Rs 6,000 / catta.
- Rajarhat contains Dhupir Bill, a 2,095 ha seasonal water body into which flows a sewage canal from Dum Dum Airport.
- The area to be filled is 50% of 1,310 ha to an average depth of fill of 1.5 m, volume of fill 314.25 lakh m³ at a rate of Rs 80/m³.
- The Government report of September 1995 states that the “government has decided” to build a township but the NOC was only submitted 4 years later in 1999 after the NGO brought the case to court.
- The High Court judgement copy reveals that clearance was obtained from the DoE for 622 ha as there were no notified wetlands. It also indicates that necessary clearance shall be obtained from DoF. However, 33 water bodies in Rajarhat have already been filled in without DoE or DoF clearance.
- New townships are required but they should be built as satellite towns and not adjacent to Calcutta. The city could expand south of the Ganga and to the west of the river where the land is higher. The city should also grow vertically rather than horizontally.

CIT Prayash Goodwill Welfare Society

- This NGO is involved in education and welfare of fishing households. It does not intervene directly but informs relevant agencies if water bodies are being filled in illegally.
- A sign was seen in J.L. Mouza Mahishbathan 24 Parganas North district (now added to Salt Lake City) in a water body: “This is private land”. It was in the process of being converted to residential land.
- Ponds are being filled in for urban development, even though it is more expensive than land, because there is more or less no land to develop.
- The northern part of the WRR is under the jurisdiction of Salt Lake City. Previously all the bheries in the northern area were in 24 Parganas North district where Salt Lake was developed. Over the last 2-3 years, the jurisdiction of Salt Lake City has extended into the WRR, including Nalban Fishery.

- Rather than developing Rajarhat township, the city could have expanded towards Diamond Harbour located 30-40 km south of Calcutta, developing a new township within 15-20 km of the city. It could also expand towards Uluberia, 30 km from Howrah on the west bank. In both areas there is less agriculture and more vacant land, and fewer ponds. The only reasons Rajarhat was chosen are that it is close to both the city and the airport.
- The farmers at Rajarhat are producing 2-3 crops of rice / year and were compelled to sell their land. They sold their land voluntarily 4 years ago but have not received financial compensation, Rs 5-7,000 / catta.

Nalban Wetland Eco-Park and Watersports Project

- The 30 ha fishpond of Nalban Fish Farm is leased by DoF to a private company for boating although the pond is still used by the fishers.
- The project charges Rs 10 entry fee with 1,200 visitors each day, increasing to 2,000-3,000 at weekends.

Dr Mohit Bhattacharya

- Dr Bhattacharya was former Vice Chancellor of Burdwan University and Dr Kundu's teacher.
- The key question is either to freeze development in the WRR or promote "wise-use".
- There is a need to establish current uses, including urbanization which has probably been considerable, and then assess the various options. IW MED should monitor the rate of loss of wetlands.
- Besides agriculture and aquaculture, one option is wastewater treatment ponds. Others are ecotourism e.g. at Nalban, and conservation as there is a considerable bird population
- Although the State and Municipal Corporation are allied with different political parties, they do try to keep in step so there is minimum friction.
- The employment profile in the wastewater-fed fishponds is politically determined so there is a need to determine the required or economic level.
- One reason for the lack of a LUDCP for the Wetlands is litigation as the judiciary is concerned about indiscriminate land use and encroachment on water bodies. Development has been frozen until alternate use plans have been developed.
- CMDA planners were educated at Harvard and do not appreciate rural life and culture.
- Land tenure is a major problem. The CMC is the legal owner of Dhapa but middleman

lease out vegetable farms with oral leases of 1 or 3 years. However, the fishponds are >90% private. Previously they were held by four main families (Ghosh, Naskar, Sarkar) but a land ceiling of 17.5 acres was introduced after 1985 so the big fisheries were split up. Comparison of satellite data of 1981 and 1999 would indicate how they were divided up.

- 50-60% of the large wetlands have absentee landlords who lease out ponds for 3-4 years. The 55 ha pond visited on 31 July was leased.
- The large ponds in the north west part of the WRR are large cooperatives. The land was redistributed (1 bigha/family or 1,338 m²) but fishers formed a cooperative as they could not manage such small areas for wastewater-fed aquaculture.
- There is a difference between formal and operational holding. On paper it may indicate multiple ownership but in practice there may be only one owner. As the system on the ground is more politically than legally determined, *de facto* and legal ownership are not the same.
- There is a suspicion that the unions control the ponds.