Concept Note

Master Plan for Agricultural and Rural Development in the Southern Delta

Background information and rationale

Bangladesh is part of the largest deltaic flood plain in the world. It slopes gently from the north to the south, meeting the Bay of Bengal at the southern end. Numerous rivers and their tributaries and distributaries criss-cross the landscape, particularly in the coastal region. The whole coast line, 710 km, runs along the Bay of Bengal. The salient features of the coastal zone is presented in Table 1.

The southern delta, i.e. the coastal zone, is physiologically and ecologically diverse. It includes important forest, fisheries, agriculture, livestock and wildlife resources. The south, south-west (S-SW) of the country, especially the Ganges Tidal Flood Plain (GTF), is the prime focus area under this southern delta (as covered in this concept note).

The coastal districts lie within three hydrological regions – South Central (SC), South West (SW) and South East (SE). These three hydrological regions are very diverse: to illustrate, i) salinity affects only particular parts of the coastal zone; ii) the rivers are subject to tidal surges; iii) the cool winter period is shorter than inland and pre-kharif temperatures are not as high.

Table 1. Salient features of the coastal zone

Coastal Zone: Salient features*	
Area	47,201 Sq km (32% of country total)
Number of districts	19 (in parts or in full) 12 in exposed coastal zone that meets the coast;
Number of upazilas	147 (48 in exposed coastal zone)
Population (S-SW)	36.8 million (2001); 41.3 million (2010); 60.8 million (2050)
Main AEZ regions	13 (GTF): Satkhira, Khulna, Bagerhat, Barisal, Pirojpur, Jhalakati; Patuakhali, Barguna; 18 (YMEF): Bhola, Lakshmipur, Noakhali, Feni, part of Barisal; (AEZ region 23 (CCP) – Chittagong, Cox's Bazar – is excluded; but additionally Gopalganj, Kushtia, Jessore and other adjacent areas are considered as relevant and interlinked)
Embankments	5017 km

* *Figures, especially of population etc, should be adjusted with specific definition of the areas under consideration.*

The development of the coastal region started with the implementation of the Coastal Embankment Project (CEP) during 1950s and 1960s. Flood embankments were raised with an intention to save agricultural land from salt water flooding and thereby to intensify rice production. Salt intrusion, sedimentation of rivers, and population pressure are the urgent issues to be tackled in parts of the region (south, south-west) for increasing food security. The UN/WFP poverty map shows empirically the severity in poverty situation that also perpetuates intense malnutrition among the population.

Due to the vulnerability of these areas to floods, cyclones and storm surges, agricultural, livestock and aquaculture activities are at serious risk and need additional support. It is necessary to be prepared for adverse events (floods, cyclones), to grow more crops and to increase productivity with the use of less water. Measures to control salinity intrusion and improve water management need particular attention. A plan for agricultural development of the Ganges Flood Plain/the coastal zone is interlinked with the plan for regional water development.

Hence, the constraints that need to be faced are complex, interrelated and need interventions of different kinds and scales. For better results and impacts in the long term, a holistic, integrated approach to planning development is needed. In doing that, experiences drawn from other countries with similar coastal environment may be of help.

The Mekong delta in Vietnam had similar constraints, which have been overcome. The Mekong delta has now become the granary of Vietnam contributing largely to the economy (and food security) of the country; Vietnam is exporting 6 million tons of rice in 2010. It is proposed that experiences from the Vietnam Mekong delta be reviewed/analyzed and if possible applied to the coastal zone (Southern Delta) of Bangladesh, integrating the local biophysical potentials into account.

Objectives

The Government of Bangladesh (especially, Ministry of Agriculture – MOA) is committed to support agricultural development efforts in the south: it is considering carrying out a mapping of areas for suitability of crops and use of surface water. The suitable zones for crops, fisheries, livestock and agro-forestry will be mapped through agro-ecological and economic analyses of the area.

The construction of the over 2 billion USD multipurpose Padma Bridge may favour a rapid transformation of the agriculture sector in the concerned area.

The Master Plan intends to provide a road map for an integrated rehabilitation and development effort in Bangladesh's coastal zone aiming at sustainable food security, poverty reduction and livelihood development for the poor. In particular, the plan will focus, among other priorities, on the following:

1. Increasing agricultural production and productivity

The cropping intensity of the area is 160% whereas it is more than 300% in some parts of the North. The most widespread agricultural land use in the South consists of transplanted Aman rice, Aus rice, relatively smaller areas of irrigated Boro rice, agro-forestry, livestock and fisheries (including shrimp). Another factor which needs to be taken into consideration is the lower productivity and yield of rice, vegetables and other crops due to increased soil and water salinity. Aman rice productivity was found to decline by 7% - 20% in part of the coastal areas during last 10 years.

Factors needing attention are measures to intensify and diversify crop production by introducing new crop varieties – saline, submergence and other stress tolerant – adapted to local environments (like BR 47, BINA 8, BINA 9, BR 51, BR 52 and other flood, drought and salinity tolerant varieties that are in the pipeline), controlling salinity intrusion, improving flood control and water management, expanding irrigation where practical, and improving communications to provide producers with better access to inputs and markets. Boosting forestry at homestead/homestead gardening would have a positive impact on diversifying household income and improving access and nutritional food security. This should also be supplemented by sound marketing plans especially for farm machineries and other modern technologies, value-chain development, promoting producers' groups and addressing societal factors.

In addition, there is a need to develop appropriate seed preservation technology, and other useful agro-technology in order to mitigate the impacts of disasters and maintain continuity in the rehabilitation programmes. During preparation of the Master Plan, suitable potential technologies for different possible climate change scenarios should also be identified.

2. Improving water management and infrastructure for surface water irrigation

The southern region's agricultural development is largely dependent on improved water management, and the development of surface water irrigation. During 1970s, 1980s and 1990s, the national irrigated area increased at a rate of 100-150 thousand hectares per year. However, the rate of expansion of irrigated area has been reduced to around 50 thousand hectares per year, and irrigation water supplies to the south-west are threatened by salinity intrusion especially caused by increasing withdrawals of river water and groundwater inland that pull down the water-table and also reduce dry-season flow in the rivers.

To overcome these constraints, attention should be given to: i) augmenting surface water systems; ii) improving significantly water management efficiency in existing irrigation areas; iii) improving polders/embankments management, including participatory management and development of institutional aspects of water management (following-up Integrated Coastal Zone Management - ICZM); and iv) mitigating salinity intrusion and arsenic contamination.

GOB is already committed to encourage surface water development programmes. Surface water irrigation has been identified as a way, among others, to enhance irrigation efficiency.

Other strategies include: i) developing and supporting an On-Farm Water Management (OFWM) technology programme; ii) developing and implementing rain-water harvesting and conservation techniques; iii) installation of DTWs in critical shallow tube-well zones to address groundwater-level depletion; iv) construction of lined canals/buried pipes to reduce conveyance and distribution losses.

A S-SW regional water development plan is needed alongside the coastal zone agricultural development plan (especially for the SW and SC hydrological regions minus Bhola island). As the surface irrigation water for the AEZ 13 (and also in other areas) is to come from the rivers and in the western part the Gorai-Modhumati is the main water source, a Master Plan should consider the 'southern delta' agricultural plan with the Gorai diversion together also.

3. Improving productivity of brackish water shrimp and capture fisheries

The coastal zone is rich in diversified fisheries production including brackish water shrimp. There are large water bodies inside the polders, where aquaculture productivity is low due to poor management practices.

Shrimp farming is widespread in the coastal zone: large areas which used to be dedicated to rice growing have now gradually shifted to aquaculture, mainly focusing on shrimps.

Polder areas encircled by coastal embankments as well as dried up rivers and canals have encouraged expansion of brackish water shrimp farming in the whole coastal region. The total area under brackish water shrimp farming was 51,812 ha in 1984, and grew to over 217,000 ha in 2008. The peak of expansion took place in the SW region due to favourable environmental and social conditions as well as availability of shrimp post-larvae in the Sundarbans estuaries. However, the productivity of brackish water shrimp farming is low and improved technology and better scientific management are needed.

Approximately 150,000 fishermen are engaged in artisanal fishing in the coastal water, and another 40,000 fishermen are engaged in fishing inside the Sundarbans. Between 1990-91 and 2006-07, the growth in industrial, artisanal and Sundarbans fishing increased by 304%, 94% and 167%, respectively, causing increased pressure on this sector, and raising concerns about stocks and ecological limits.

4. Promoting smallholder poultry and dairy development

The coastal zone supports many different types of livestock. However, generally speaking, livestock suffer from malnutrition due to shortage of feeds and fodder and their productivity has declined quite considerably in the past few years. In turn, malnutrition has favoured parasitic infestation of animals necessitating regular de-worming. Soil and water salinity also hamper livestock production in some areas.

Buffalo are the livestock best suited to saline areas and they are particularly resistant to diseases. Buffalo milk is rich in fat and can be processed for preparing milk products.

Promoting small holder poultry and dairy development is essential for poverty reduction, food and nutrition security, empowerment of women and employment generation. There is a need to: (i) support improved nutrition of animals for higher yields by promoting fodder production; (ii) promote producer institutions for smallholder inclusion and access to formal milk market through dairy farmers' association, processing and value addition; (iii) strengthen community-based animal health services delivery, including vaccination, availability of high quality feeds and chicks at affordable price; (iv) develop complete cattle feed block from crop residues and their by-products; (v) strengthen government and other relevant public institutions for farmer training in husbandry and feeding practices; and (vi) re-orient Farmers Field Schools to support the above activities.

Conclusion and recommendations

There is considerable potential to improve the productivity of crops, livestock and fisheries in the coastal zone (southern delta) with better use of technology and improved management practices utilizing available knowledge in the country and also lessons from other countries. The Master Plan for the Southern Delta is considered a high priority by the GoB and would represent the framework within which all development activities in the region could be undertaken. The next step is to identify the institutional arrangements and scope of on-going programmes in the region so that an integrated development plan for the zone can be prepared.

GoB, FAO, other development partners as well as non-governmental organizations are working in the area, especially in the rehabilitation of areas affected by cyclones Aila and Sidr. Each of the organizations works at different levels, each within its mandate.

A coordinated approach, such as a Master Plan, would assist to avoid duplication of programmes. It is also crucial that the Ministry of Agriculture (MOA), the Ministry of Fisheries and Livestock (MOFL), the Ministry of Water Resources (MOWR), Ministry of Local Government, Rural Development and Cooperatives (MOLGRDC) and the Ministry of Environment and Forests (MOEF) work in a coordinated way and prepare coordination modalities to this effect. There is also a strong need to link uncertainties in water issues with climate change issues in the agricultural development scenario, in order to achieve sustainable development for the country, and in its effort to become Middle Income Country by 2021. Further, involvement of GOB, development partners, Non-Government agencies, local government, academic and research institutions and other stakeholders should be brought under a coordinated dialogue during the preparation of master plan. A panel of experts with high level coordination mechanism may be considered in formulation, monitoring implementation and future follow-up for such an integrated master plan.

FAO has been supporting the GoB's leadership role in preparing the National Medium Term Priority Framework (NMTPF) and the Country Investment Plan (CIP) etc, and coordinated DP support. The Netherlands has been contributing to water sector development in Bangladesh for over the last 20 years, and reinforced its collaboration with Bangladesh in the **'Water Mondiaal'** programme recently (April 2010). Additionally, their **Delta Alliance** provides with the platform of "knowledge to knowledge" (K2K) initiative, i.e. research and knowledge sharing linkages among R&D institutions and initiatives. These facilitate a long-term sustainable collaboration, scoping for bi-/multilateral funding and effective monitoring mechanism for the joint programmes under an integrated master plan.

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