Hanging Garden
A Voice for People's Perspective

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Preface

The southwest coastal region of Bangladesh is an active part of Ganges Delta formed by fine clay soil (Flubic) carried in by the upstream flows which is very fertile and rich in biological diversity. The livelihood of the people of this region is highly dependent on the natural resources. Agriculture and fisheries are important economic sectors employing a large portion of the population. Major Agricultural crops include rice, betel and vegetables, mustered and oil seed. Endowed with an abundance of natural resources and high biological diversity, there was need for an appropriate development initiative for optimal utilization of its resources for improving the living standards of the people.

Without giving due importance of long experience and indigenous knowledge of the community with the support of International Financial Institutions (IFIs) government had implemented projects such as Coastal Embankment Project (CEP) which terned watlands to dryland creating conflict between costal ecosystem and agro ecosystem. Solving the problem Govt. took Khulna Jessore Drainage Rehabilitation Project (KJDRP) with the support of Asian Devepment Bank (ADB). The project was also failed.

Instead of reducing water logging IFIs funded projects created more destruction. More or less 106000 hectors of land wsa affected in 1990. Due to water logging agriculture became impossible in eight upazillas in Khulna, Jessore and Satkhira. Cultivation of Aman(a local verities of fine rice) has been abandoned in some areas due to water logging. Cultivation of Boro rice is left as the primary crop but is also slowly being reduced and the production of Robi (horticulture) is now at highly unsatisfactory levels.

Hundreds of thousands of people became unemployed as a result of the water logging, especially the poor and marginal. Share coppers landless agricultural wage laborers petty trader and others became unemployed. They were constrained to change their normal occupation. Agriculture was reduced to a minimum and even homesteads vegetable gardening and cattle rearing became impossible. There was no dry space for homestead vegetable gardens or to rear poultry and ducks. The poor, who depended on such homegrown nutrition as fruits, vegetables, eggs and milk, increasingly became victims of malnourishment and food insecurity. Women and children were the worst sufferers. Impelled by these sufferings, the people of this region have launched numerous social movements demanding mitigation of the problems.

Beside the movement the affected community invented a unique cultivation system in their areas which is popular as hanging garden.

It can also be the most effective way of cultivation of crops in the wetlands and water logged areas that might no way disturb the ecology and ecosystem.

The purpose of this publication is to bring to light the sufferings of the water logged community and their innovation (Hanging Garden) for enhancing food security and their movement against the development disaster done by International Financial Institutions (IFIs).

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Background

Since ancient times in Bangladesh human habitats, their mode of living and method of subsistence all have been built up on the basis of water resources. The civilization growing out of the process of riverine civilization pervades every sphere of our life, particularly art and culture, songs and literature. (So trend, tendency, development approaches or policies governing the livings have got no alternative but to be consistent and in harmony with rivers and associated wetland ecosystem).

Various nations and states the worlds over are usually named after diverse historical events and with historical perspective in view. But the historical background of Bangladesh as a name comes after its geographical location. The region between the Bhagirothi and the Padma, the two main streams of the Ganges has been known as `Banga' for about last 3 thousand years. To many, `Bango' as a name originates from Sino-Bhutanees and Tebetan word `Bang', which means wetland. In distant past the Northeast region of Sunderbans was a vast expanse of forest and through deforestation of the same human habitats have grown there.

According to Mughal historian Abul Fazal in ancient time the kings of the region used to build up 20 yards wide & 10 yards high `Al' (dykes) for human settlement. We think `Al' when suffixed with the word Banga does the word Bongal/Bangal originates, which would mean the inhabitants of Bango. On their first introduction with Bongal/Bangal, the inhabitants of the coastal areas, the foreign traders & merchants became familiar as such with the hinterland (Northern part) of this country. Thus originates Bangal after the name of southern Bango.

During the second half of the twentieth century, development of the delta has been dominated by a strategy of controlling floods based on construction and operation of structural works on its river systems and water bodies. These consisted of a variety of engineering structures, such as embankments/dykes, polders, regulators and sluices, which were built to function in a coordinated manner as elements of integrated flood control and drainage (FCD) schemes. Installation of these structures clearly involved interventions in the hydrological regime of the delta. Despite variations, the FCD schemes were essentially aimed at excluding excess water from project areas during the monsoon floods. This had the effect of providing protection from floods, as well as converting normally flooded ('wetland') areas into flood-free 'dry lands' for the purposes of increased crop production. As a result, a massive flood control program was launched in 1964 under what was termed the 'Master Plan' [Adnan et. at, 1992: 36-39].9 This huge enterprise consisted of 58 FCD projects spread

out over the delta, to be implemented over a period of 20 years. By the end of the 1980s, nearly 7,555 kilometres of embankments, several hundred polders, as well as 7,907 hydraulic structures had been constructed across much of the delta by the projects of the Master Plan [Khan, 1991: 11].

The people in Khulna, Jessore and Satkhira are the major victims of this human made calamity. People of the areas ceaselessly have been raising their voice against the interventions to get rid of it. They organized several movements against water logging and unplanned projects of IFIs. But their voices are still unheard. Now it has been beyond the capacity of the water logged people to survive. They are passing through an inhuman struggle to earn their bread in a dome where everything related to livelihoods is out of function.

People are trying their best to survive their lives by the way of innovation. Hanging garden is one of those innovations that the community and local organizations have innovated to cultivate some vegetables in an effective way. Besides, this method can provide more productions by less expenditure than the traditional agricultural system.

South-west coastal region

There are approximately 711 km of coastal area in Bangladesh. The area is also divided according to location into East, West and Central Coastal area. According to these classifications, 7 Upazilla of khulna, Bagerhat and Satkhira districts are considered to be exposed coastal zones while the remaining 23 Upazillas of these 3 districts are considered to be interior coastal zone. Although the Upazillas of Jessore, Narail and Gopalgonj are not considered as exposed coastal areas, 17 Upazillaa of these 3 districts are considered to be within the interior coastal zone. So, the Southwest coastal region can be said to typify the characteristics of the coastal Upazillas of Khulna, Bagerhat, Shatkhira, Jessore, Narail and Gopalgonj districts.

Generally, according to the river basin, the area from the Tetulia River in East to the international border between India and Bangladesh, located at the Hariabhanga River in West, (ESCAP/UN,1987) is known as the Southwest coastal region of Bangladesh (WP005, PDO-ICZMP, Delineation of the Coastal Zone, Dhaka, December, 2003).

The entire Southwest region of Bangladesh is part of the great Ganges delta which extends from the Bhagirathi-Hooghly eastwards to the Meghna estuary through which the Ganges discharges its waters into the Bay of Bengal. The Bangladesh portion of this delta lies between the Meghna estuary and the Ichamati-Kalindi River on the border with India.

The southern part of the region has a brackish water regime, while the northern portion has fresh water. The region is comprised mostly of low-lying land, barely one metre above mean sea level. Most of the land used to be Tidal Flood Plain. The region is criss-crossed by numerous rivers. But during the last 3-4 centuries, the big rivers lost their connection with the Ganges and became mere drainage channels for surplus rainwater. The Gorai remained as the main distributaries of the Ganges before the Ganges joined with the Brahmaputra and Meghna. The tides used to govern the environment, ecology and economy of the region.

Natural setting and Human Intervention in South-west coastal region in the 19th century

In the 19th century, the then government of the British East India Company received complaints about the heavy current in the river Mathabhanga. Engineers deputed to address the issue sank a number of earth-laden boats in the Mathabhanga, just below its intake point from the Ganges. This resulted in the reduction of flow in the Mathabhanga, and within a very short time, the intake point silted up and Mathabhanga lost its connection with the Ganges. Sometime afterwards, the Jalangi also lost its connection with the Ganges. As the Jalangi joins with a branch of the Mathabhanga to form the Bhairab, the latter river also lost its source of supply of Ganges water, and became a mere drainage channel for rain water.

This massive reduction in the flow of fresh water from the Ganges led to increased incursion of tides into the coastal rivers through the numerous creeks and estuaries that pass through the Sundarbans, and resulted in increased salinity in the districts of 24 Parganas, Khulna and parts of Jessore.

A vast tract of low lying tidal flood plain in the coastal area of Bangladesh is flooded twice in a day. For many years, these lands used to be protected by dwarf embankment under the initiative of local Zamindars. Paddy cultivation in rotation with fish production was the main activities of the people of the area. Ecology and socio-economic live have been regulated by the rivers and wetlands.

the local people under the leadership of local "Zamindars"/landlords and "Matabbars" used to construct small earthen dikes of eight-month duration and wooden sluice boxes around different "Beels" or "Ghers" on cooperative basis-that was very much coherent with the local environment with a little hindrance to natural flow of biodiversity and silt. A professional community was developed for the purpose, locally known as Shana (means, those who organized people maintaining embankment). The cost of those constructions used to be realized in "Hari" system. That means after harvest 2% to 5% of the paddy had to be given to the local management committee (equally by landowner and crop sharer).They also build large numbers of fresh water ponds as watershed for drinking and domestic use for settled populations. Farmers used to cultivate these tidal flood plains during the monsoon rains, by protecting the lands from tidal incursion by building earthen dikes and temporary sluices.

After the harvest at the end of the monsoon, they demolished the dikes and sluices, and the tides used to be given free play to replenish the land with silt. The silt not only compensated for the subsidence, but also revived the fertility of the soil because of the high content of decomposed organic matter in the silt. The poor and marginal farmers and landless laborers then took up fishing as a supplementary occupation during the "off-season" for agriculture.

With ample supply of rice and fish, there was never any deficit of food in the region, and thus no cause for any social conflict. Consequently, agriculture, coastal-biodiversity, navigability of rivers and land build up process were quite unaffected but often-tidal surge disrupted rice production, and human settlement exist side by side thereby coastal ecosystem and agro-ecosystem exist site by side without harming each other. The fertility of this region has always attracted people from other parts of the country.

But the thoughtless and improper intervention, both nationally and internationally, from within and without on the natural flow of water, has tilted the total ecological balance. This has resulted in the phenomenon of massive water logging in one part of the country and desertification process on the other areas of the country causing immense suffering for the people. People cannot produce paddy, cattle cannot graze over the lands, trees cannot grow well and fishes cannot survive. This is only because of water logging that has been induced over the decades by the government being prescribed by IFIs. They built up embankments in the name of flood management and crops protection from disasters. Alongside they tried to introduce different varieties of agricultural products from outsides in the name of creating green revolution. In the long run the embankments retarded the natural flow of tide and siltation and created water logging in the coastal areas.

International Financial Institutions (IFIs) and Development of Bangladesh

For hundreds of years, western colonialists and imperialists have plundered the wealth of India and other third world countries. Now these forces are back again in the name of Free Trade and Globalization. Multinational Corporations and Transnational Organizations supported by IFIs.

IFIs and other donor agencies have, for the past few decades, provided Bangladesh with loans and grants in the name of such lofty objectives as 'poverty reduction' and 'international development'. However, these loans inevitably come tied with conditions which hinder the country's economic growth and poverty reduction. The detrimental effects these conditions have had on Bangladesh are immeasurable, putting the country under increasing pressure to abide by the prescriptions imposed by the donors.

IFIs advocates for corporate globalization, IFIs and their allies work for international capitalism, exerting a heavy influence on global trade policies that mainly promote trade liberalization and public sector privatization. Many of the Least Developed Countries (LDCs) have become a place of experimentation for trade liberalization at the hands of IFIs who pressure the government into liberalizing policies. This causes serious devastation in public service sectors including heath, education, water, agriculture and food. IFIs have designed projects in the name of development, but none of such projects have so far been able to achieve their declared objectives, the projects have generated long term negative impacts, which have not only caused massive damage to the environment, but have also increased the poverty and misery of the people.

Many projects undertaken by the IFIs in Bangladesh ignored the opinions of local communities and were implemented of Bangladesh. IFIs prevent democratic ownership by applying their strategies as conditional tools over the country. Furthermore, people are kept away from the whole process of the project formulation and implementation and there is no accountability for their actions. No democratic space is practiced either in policy formulation or project implementation processes.

In Bangladesh, aid and confessional loans churned out by IFIs have given a minimum focus on agriculture. The lion's share of funds has gone to power, infrastructure and forest projects. The ADB is the biggest IFIs in the Asian region which provides lending, as well as structural and policy changes. In most ADB developing-member countries, transparency and public participation is not satisfactory. Development effectiveness of ADB activities is also questionable. Bangladesh joined the ADB in 1973.

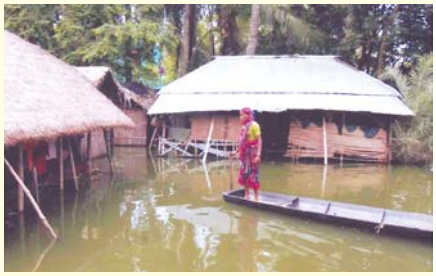
IFIs intervention in the southwest coastal region

All most all the projects of water and biodiversity releted projects in southwest coastal region were undertaken by the IFIs and Aid agencies. Among the projects Coastal Embankment Project (CEP) was funded by USAID, Sundarban Biodiversity Conservation Project (SBCP) and Khulna-Jessore Drainage Rehabilitation Project (KJDRP) were funded by ADB. The lack of consideration of local communities resulted in the projects with disastrous consequences for the environment and communities' livelihood. Though the projects were not successful- as admitted by the authority - there was no accountability for the cause of people's suffering. Even the victims have not been compensated though the communities have been calling for this for the past few years.

Coastal Embankment Project (CEP); 1960-1978

On 1960 the then Government started construction of CEP under USAID assistance. The CEP is the biggest flood control project in Bangladesh with the project area covering approximately 6 per cent of the area of Bangladesh.

In the decade of the 1960's, propelled by the need to produce more food-grains for the fast growing population and encouraged by the advent of the world-wide Green Revolution heralded by the development of High Yielding Varieties (HYV) of rice, the then government of East Pakistan designed the CEP, enclosing all the tidal flood plains into polders. Polder is a Dutch word meaning an area enclosed by dikes. The project was implemented in two phases between 1961 and 1978. Phase I comprises some 92 polders providing protection to one million ha of land. Phase II consists of 16 polders covering another 0.40 million ha. Within the CEP more than 4,000 km of embankment and 1,039 drainage sluices have been constructed.



The project authority did not consider the fragile ecosystem of the coastal wetlands. After initial successes, intervention in Channels and tidal flooding led to problems of sedimentation, some of which have caused blockage of drainage channels and structures. Disconnected the wetlands from the rivers and prevented sediment formation inside the wetlands which gradually caused the drainage congestion of the rivers as the sediments deposited on the river bed. Many places of the river bed became higher than the wetlands in the surrounding basins. These effects are causing channel silting and reduced navigation, poor drainage and loss of river and khal areas.

Khulna Jessore Drainage Rehabilitation Project (KJDRP); 1995-2004

The KJDR Project was approved by the ADB on 14 December 1993. Project completion, stated for December 1999, was delayed by almost 4 years due to the adoption of a new drainage design mid-way. The total cost of the project was $44.9 million or 72% of the appraisal estimate of $62 million.

Bangladesh Water Development Board (BWDB) had taken steps to resolve the problem through rehabilitation of polder system for which Dutch consultant HASCONIN proposed Modhukhaly and Solmary regulator in its core plan, with this system, Millions of taka were spent to re-excavated rivers and canals and construction and repaired of sluice gets, and new roads.

As a result of the rise in the channel bed relative to land levels in the flood protected area, serious problems of drainage congestion and water logging have developed in the Polder-25 (Beel Dakatia) in the South West (SW) region. Some of the channels are almost dead due to siltation. The siltation of tidal rivers is spreading progressively southward i.e. seaward (Halcrow, 1993b) which gradually created permanent water logging, covering over 100,600 by 1990.

The local community organized several movements and raise their voice for the use of a local method called jowar-bhata khelano (free play of tidal flow) as the alternative plan. Referred to as TRM, this method allows tidal flow into the wetland basin and releases the tidal flow back to the river. The TRM prevents sediment accretion on the riverbed and ensures drainage of excess water during monsoons. It also creates better navigation in river channels. However, the ADB ignored these alternatives, according to the Civil Society Organizations (CSOs), and opted for non feasible solution for the project. Bypassing the root cause of water logging, restructuring and rehabilitations of KJDRP was officially completed in 2004.

According to CSOs, the KJDRP did not achieve its objectives of increased agriculture output and livelihoods, but rather created more social and environmental problems in the area. For instance, they contend that the project resulted in more water logging in Northwest area (Jessore) of the project, worsening the existing drainage problem as the Hamkura River dried up.

They also claim that KJDRP contributed to the extinction of local fisheries and loss of livelihood of local fisher-folks. Even the Project Completion Report (PCR) states that project implementation delays could have been reduced considerably if the beneficiaries' demand for the TRM system had been appreciated earlier.

In 1997, ADB sent a fact-finding team and endorsed the viability of TRM. This Prompted ADB to ask for and independent Enviorment and Social Assessment (EIA/SIA) of the regulator option which was done by CEGIS. ADB advised the BWDB to redesign the project and incorporate the concept of TRM. However, the TRM was not implemented according people's suggestions. Local wisdom and water management practices were undermined. Total 70,000 ha land were under water logging.10, 000 ha under cultivation, and 25,000 ha cultivated by pumping water out in the dry season.

The Operation Evaluation Department (OED)'s decision to include KJDRP in its 2007-2009 work-plans constitutes the first victory in the campaign to ensure the approach taken to manage drainage is not repeated in other ADB-funded projects in the region. The ADB's OED has evaluated the KJDRP in March 2007. On 11 January 2008, the Officer-in-Charge, Operations Evaluation Department, of ADB received the response from the Managing Director General on behalf of Management. In that report KJDRP failed to reach its desired objective.

Impact of IFIs implemented projects on the people of the southwest coastal region

Water logging: Water logging of 2006 in Jessore-Khulna-Satkhira Districts of South-Western region of Bangladesh has crossed all times record. The water logging area in this region was only 28,000 hectors, now it has extended up to 200000 hectors. Meanwhile, 12, 04,159 number of people of 2, 53,066 families have affected in 5 Municipalities' and 145 Unions of 12 Upazilas of above District. 5-7 k.m of Rivers are being dead every year by siltation at the end of high tide, Hamkura, Jhapjhappia. Bhadra and some other rivers have already been dead; Kapotksha, Betna, Moricchapp, Upperbhadra, Hori, Salta, Taligati- Ghangrail and some other rivers are now in on its last legs.

Ecological Degradation of the Rivers: Hamkura River is now silted up and dead. Thirty-five kilometers of the Hamkura River has been alive and flowing before the implementation of the KJDRP. The Hamkura River flow was divided by the project to Hari River basin and upper Sholmari basin despite repeated objection by the local communities. Water logging problem in Hamkura River basin still persists, in polder 27/1 and polder 25. The connection between upper Bhadra and Buri Bhadra is now almost dead. Rivers in north-west part of KJDRP area, namely, Teligati, Hari upper Bharda and Harihar, are now under threat. The situation would have further

Loss of Agriculture: However, nature's reaction against the intervention was already building up. In the mean time, the flood tolerant and salinity tolerate rice varieties have mostly lost from the farmers' field. Crops of 50,000 acres land destroyed. The total damage of crops and infra-structures are about 500 crore.

CASE STUDY

Afser Ali (45), is a farmer lives at keshobpur Upazilla of Jessore district. He had 1.6 hectare of lands in 26 Beel (West Beel Khukshia) areas and he started his life as a farmer and look after his father's farmlands. He produced rice, jute, sesame and other crops and vegetables and passed peaceful life with huge crops and vegetables. But lot of water related projects changed the whole situation. The cultivable fertile land turned into water logged barren land.

The community of the water logged areas including his family is suffering from food crisis. The temporary drainage congestion, which first appeared in 1982, gradually became permanent water logged by 1990; an area of 100,600 hectares in Khulna and Jessore districts alone was permanently water logged. Afser Ali has been involved with the movement of Water Rehabilitation Struggle Committee, Water committee eradicating water logging. In his life time experience Afser ali understood and felt that lot of money have been spent in this areas for development but all are in vain and created development disaster like water logging.

Malnutrition and food insecurity: The water logging rotted the roots of trees, and within a few years, all the trees were dead. As no grazing land was left and agriculture was reduced to a minimum (in areas where the water dried up during the dry months of the year). There was no dry space for homestead vegetable gardens or to rear poultry and ducks. The poor, who depended on such homegrown nutrition as fruits, vegetables, eggs and milk, increasingly became victims of malnourishment. Women and children were the worst sufferers. Scarcity of fodder is very common in the entire region, which has drastically reduced the number of livestock and poultry. This ultimately leads to the reduction of protein sources. In the stressed period, the hardcore poor usually take undomesticated food. However, due to the continuous water logging they have lost these sources of their food. It has seriously affected women and children. As the people of this area have lost livelihood opportunities to a great extent, they have lost thereby the purchasing capacity. Due to lack of proper foods, mother and children are getting malnourished.

Unemployment: As hundreds of thousands of people became unemployed as a result of the water logging, especially the poor and marginal farmers, share-croppers, petty traders in agricultural produce, agricultural daily wage laborers, boatmen and others engaged in petty service trades, all lost their traditional occupations.

Migration: Traditional livelihood pattern had been damaged and faced to change many males migrated to urban centers with or without their families in search of employment, settling in dirty, congested slums in the towns and cities, and getting hold of whatever work they could manage to obtain. But many of them, unable to feed or clothe their families, abandoned them.

Social Insecurity: The water logging has changed the situation of these areas. It has greatly changed the livelihood pattern of the people. People now greatly lack their traditional livelihood options. They have lands but are unable to use for production of any crop due to water logging. All farmers are now totally unemployed as there is no way to use their lands for cultivation. They are now compelled to go for seeking works in other areas. It has been the push factor for out migration. Due to water loging many males also migrated to the cities in search of work, leaving their families behind, to cope as best as they could. This resulted in an increase in the number of female-headed destitute families. Social crimes increased and women and children became victims of various forms of harassment, including trafficking.

Increasing Shrimp Cultivation: With the advent of water logging the demand for frozen shrimps began to increase in the world markets, resulting in water logging areas being converted into shrimp farms. As the world demand of shrimp continued to increase, the low lying rice producing lands were also converted into brackish water shrimp enclosures. Shrimp farming threatens biodiversity, increases the number of landless, and reduces food security.

Peoples' movement for solving the problem

People in the southwest reign have a long history of movement and fighting IFIs. In the last decades there were a number of movements against large scale infrastructural water and flood management projects. There were movement against ADB funded KJDRP project. The movement was nationally now well known as beel dakatia andalan. ADB had to stop the project. There were also numerous other localized movement to solve the water logging problem and river drainage congestion in southwest region. Local community have shown a deep understanding of the ecosystem of southwest and resisted any construction heavy project in the region.

Noronia Canal digging movement: A five vaulted flush sluice gate was constructed at Bonodhikhana of Baduria in Dumuria in 1967 under the CEP. Water of 6500 ha areas of 54 villages was drained out by this gate. But at the 6th year construction of sluice, canal became silted up as a result the areas became water logged in 1973. In 1976 the local community dug a alternate canal through voluntary service and made its interconnection with Bhodra River directly. Administrations was objected such activities, but people overcoming all sorts of harassment and completed the canal digging work; as a result water logging was removed from the areas for the moment.

Death Trap Bhobodhoho's Regulator resistance movement: In 1965 two parallel gates was built at the end of Hari River. One of them was 21 vaulted and the one was 9 vaulted. In that time the depth of the river was 45 ft. Within the 15 years of gate constructions the river became silted and waterlogged the areas. As a result 139 villages of Sadar, Monirumpur and Avaynagar upazila of Jessore district were fallen in disasters.

To face such situations in 1986 thousands people of the locality broke down the sluice gate to commence again the open tidal action. People's movement compels President Earshad to come down in Bhobodhoho at that time. After breakdown of dam, it was evident that water logging removed and farmers became able to produce crop in beel Kedaria, beel Baker etc in that year, open tidal flow water of beel Kedaria recede significantly. But BWDB again repaired the broken sluice gate.

Dohuri Public Cut movement: Bhoduria situated at the west bank of Hari River. This movement have been linked with BDWB and owners of shrimp farm, incorporated government owed "khash" cannel in their farms and they mad cross-dam on it that creates obstruct water to drain out. Around twenty thousand people participated in that movement. In 23 July of 1988 one police and one civilian was died, in this collision hundreds of civilian were injured. At last local community able to evicted lease farms and commenced open tidal

Iregulation through open channel. It this context, BWDB filed 3 cases for public cut and 4 cases for farms eviction. Around 3 hundred people were accused and suffered 11 year running the cases, later they were got release from the cases under political pressure.

Open tidal intrusion in Boruna and Pathra Beels: In the dry season of 1988-89, BWDB began river digging by cross-dam at the down Stream of upper Bhodra River. As a result the down stream of upper Bhodra cause rapid siltation up to 7 feet which out-brake water logging at the adjacent areas, to get rid off from this water logging the local community open the Burna and Pathra beel for regular tidal action. So the river get its stream and a vast land became free of water logging the Beel became resourceful with natural fish, adjacent area become high with siltation and numbers of plant also dies for high salinity, after one year the dam was reconstructed by BWDB.

Initiative for Right View (IRV) undertook an initiative to strengthen peoples movement on ADB funded projects through building strong coordination with local community, system development on peoples alternative livelihood in the waterlogged areas. It was designed to create a safety net and to demand accountability of ADB for the protection of community. Social mobilization, discussion, experience sharing, advocacy and awareness raising programs are going on.

Movement on well-known Beel Dakatia: To remove the water logging BWDB took a Tk. 64 crore from Khulna Coastal Embankment Rehabilitation Project which included a regulator, sluice gate construction, canal digging and dredging etc. but after dredging the Sholmari river dredger couldn't move back due to siltation in down stream. In their proposed plan Hamkura river was blocked by regulator, it would be a great devastation due to huge siltation in down stream as it was happened in Sholmari river. Mass agitation inoculated around against the project and the on going activities of the project was withdrawn after completing only 11 percent work. But BWDB didn't take any alternative to remove the water logging.

Beel Dakatia movement has recognized as a historical movement on facing water logging and into a national issue in August.1990, A large number of spontaneous people gather at polder site Beel Dakatia on 17 August with the call of "Beel Dakatia Action Committee" ignoring the Govt ruling of 144, combating local administration with armed forces and open the beel by four public cut, thereby introduces regular tidal action in Beel Dakatia. People open the Beel for regular tide which continued only three years and 9 months; as usual BWDB closed Sandther Cannel by cross dam that Leeds rapid dying of Hamkura river in no time.

Movement to Ensure Tidal Flow in Beel Bhaina: When water upstream of Bhabadha flooded Beel Bhaina in 1997 local people organized and decided to cut the embankment constructed in the sixties under CEP. Local people mobilized in thousands and defied policies and cut the embankment in October 1997.After 20/25 days they cut another embankment one kilometer upstream. The objective was to ensure uninterrupted flow of tidal flow in the beel and ensure sedimentation. The water logging problem in the area relieved greatly and the river became wide and deep. The land level of the beel was raised as a result of sedimentation. There was also abundance of fish in the beel and river. Local communities asked the KJDRP authorities to ensure planned systematic management of tidal flow in Beel Bhaina. The idea later became well known as TRM. KJDRP authorities were skeptical to TRM. Although local initiative for TRM in Beel Bhaina was not implemented in a planned way but the result was remarkable. The land level was raised enabling the local farmers to cultivate throughout the year. The surrounding areas are plagues from water logging problem but Beel Bhaina is now free from water logging.

Peoples Innovation:

The Pople of water logged areas were visibly at stake and restless how to recover their livelihood options and survive within the waterlogging situation.

People are striving their best to survive their lives by the way of innovation. Such as vegetable gardening on floating bed (hydroponics), crab fattening, Mele cultivation hanging garden is an innovative strategy for facing water logging besides these hanging gardening includes as new invention. Hanging gardening helps to produce enough vegetables for family need and to allow people to sell the excess to generate income. It aims to preserve local seed verities, encourage replication of these practices in other communities and enhance the nutrition.

Hanging Garden: Hanging garden is a garden which is made as an earthen platform set over a triangles bamboo stand bamboo frame. The platform is made on an earthen basin, which is filled in mud, cow dung and fertilizers. Some particular types of crops and vegetables are grown on the platform. The platform is placed in the areas where water logging takes place and endures for 5-6 months and most of the places go under 4-5 feet water. This platform is made 5-6 feet high. Basically herbs and shrubs types of crops and vegetables are possible to be grown over the platform.

The Gardener: It is primarily the women- especially widows disabled women and comparatively poor women- who are engaged with hanging garden.

Cultivation Process: The gardener selectets suitable place for hanging garden. The place where the shadow of trees is less i.e. sunlight's available and open is suitable for hanging garden. There are some procedures in preparing the soils for the garden. First fertile soil is heaped at a place which is thereafter mixed with organic fertilizer or compost of cow dung, hyacinth, dusts, duck and hen's faeces, kitchen dusts etc.

The fertilizer or compost should be one-third of the total mixture. The soil is prepared during dry season in March or April. The mixed soil and fertilizers are put into the earthen basin placed over the bamboo frame. Then the seeds of herb and shrubs are sewed. Local seeds are good for hanging garden. The platform of hanging garden is locally called as Nada, which is made of clay by the potters. Generally five seeds are sewed in a platform. When saplings grow, bad ones are removed from the platform leaving the best two.

Saplings require water for two times a day. If the insects attack, cow's urine can be sprayed as insecticides. In that case, urine should be preserved in a jar. After 10 days, that can be sprayed to the shrubs mixing with 10 times water. The herbs and shrubs require proper nursing. When the shrubs grow up and spread heavily, a scaffold is needed to be constructed for widening the areas of the garden as well as spacing for

good growing of the shrubs. This is also possible to place the shrubs over the rooftop of the houses. When the herbs grow flowers, male flowers should be plucked and touched with female flowers for cross pollination.

The materials and cost for hanging garden: Making a hanging garden costs only 350 taka. Some materials are required for making a hanging garden. A Nada (the earthen basin) is a must. There needs three pieces of bamboo, which are framed in such a way that it can act as a stand for hanging the platform. A mixture of mud, cow dung and compost is needed to make the platform or bed. To help the herbs hang on, a gallows is needed to be constructed over the platform. Bamboo sticks can be used in this regard. This is to mention that most of the materials required for hanging garden can be found available at home and its surroundings.

The crops: Chilly, tomato, gourd, pumpkin, cucurbitaceous (Jhinge), bean, spinach and some edible herbs are grown in hanging garden. Of those, cucurbitaceous, edible herbs and chilly are produced well.

Effect of hanging garden: Hanging garden has greatly contributed to the lives and livelihoods of water logged people in Jessore in the following ways:

- The farmers who are growing vegetables through hanging garden are now greatly able to meet their nutritional needs
- Some families who can grow more through hanging garden can earn money by it through selling the surpluses.
- By hanging garden, local agriculture has received a little fuel to survive.
- It has also created people's togetherness and mass awareness on the causes of water logging.
- Women are now the recognized earning members of their families by the virtue of hanging garden.
- Women are now capacitated to raise their voice on their problems, which are induced by water logging. They are now well known to whom are the culprits of water logging. They are now organized on their issues
- Women now can lead their groups. They're now raising their issues in the regional and national levels' spaces. They have created an involvement with local government representatives, civil society, journalists and are working with them on the issue.
- At the very outset, males did not take the initiative positively. They are now impressed seeing the success of hanging garden.
- Hanging garden has created inopportunity to mobilize farmers towards creating their voices against water logging and the culprits who created the hazards in the name of development.

Acceptability of hanging garden: In the water logged area, people had no way to produce even a single crop. They did not have capacity to buy vegetables as much as they required. Initially 30 families were included for hanging gardening. Then other families expressed their interest in it. Many families started hanging garden being learned and followed by the process. Moreover, many families out side the areas started hanging gardens as an alternative way of producing vegetables.

Farmer's experience

Sufficient vegetable has been producing that able to fulfill nutrition need in every season. The gardener has been sold their excess vegetable to market thereby generate some income. it already showed very potential and received popularity to the beneficiary area. Inspired by this system another local organization has taken such kind of activities in waterlogged areas. Women's indigenous knowledge was promoted for food production and sustainable agriculture and initiative for achieving women's rights on seed and food sovereignty enhanced.

Hanging Garden can also be the most effective way of cultivation of crops in the wetlands and waterlogged area that might no way disturb the ecology and ecosystem. This method can provide more productions by less expenditure than the traditional agricultural system. It can also be an effective for fisher folk community. As the fishermen are sometimes restricted from fishing for few months to protect reproduction, hanging gardening can be very supportive to their livelihoods.

This is also possible to replicate hanging garden in other low lying areas, where water remains for 4-5 months on the lands. In other areas, where water logging is a problem, hanging garden can be a true alternative. It can also be a tool for demonstration for drawing attention of government, IFIs and donor communities on the shortcomings of their interventions as well as the urge of the people.

The agriculture based on hanging garden could be the most effective way to cultivate any crops in the wetlands and water logging area with the water imprisoned community in the Southwest coastal region to promote cultivation of vegetables on homestead plots for household consumption and market in water logging and highly saline areas. The techniques are yet to be adapted to the specific conditions of different areas of Southwest coastal region; it already showed very potential and received popularly to the beneficiary area.

CASE STUDY

Anima Sarker is a house wife of the village Bagdanga of Panjia Union Parishad under Keshobpur Upazila in Jessore District. Her family has 84 decimal lands of which cultivable land is 81 decimal and homestead is 3 decimal. The painful situation is her family is completely unable to grow any crop from their land during the last four years. For Her family's livelihood she has changed her profession. Her family has now been living their live through fishing. She informed that her family earns 24 thousand taka yearly. Since the cultivable land is under water 8/9 months in a year, for their day to day nutrition demand they can not grow any vegetables. As it is impossible to grow anything in the field, when she was proposed Hanging Garden method she was interested. Though the production in comparison with natural cultivation in this regard is less, it is cost effective. The total cost of cultivation through this process is 500 hundred taka approximately. In this process she has met her daily nutrition demand as well as sold the surplus in the local market from which she has earned additional money.

Conclusion

Transforming Bangladesh's floodplains from "wetlands" to "drylands" by "excluding" surface water during the flood period are the prime objective of BWDB and it not exception in coastal region also, but in active delta where land formation is yet to complete, this "transformation" must be a backlash as water logging. Water logging is the disrupting phage in-between dry lands and wetland. Water logging is inevitable without live river in our active deltas. BWDB and IFIs appointed consultants are counter to that. Water logging areas is now expanded beyond KJDRP.

We are at cross border of living with water or living with live river that free from flood. On the other hand backlash of supplanted system and climatic change (sea level rise) will shrink our future to choose. Total recovery of water logging from this region is a dream; partial mitigation is hope for the best. Living with water logging (Transforming water logging in to wetlands) and combating for removing the barrier of water logging will be run side by side is the realist approach to resolve the multi-dimensional problem we running into. Large-scale infrastructure will not resolve crisis permanently but incur huge ecological damage and extended social exclusion. The fact that these structural interventions had generated new form of physical and economic risk as well as social and political conflicts arising from consequences, were often BWDB cleverly utilized for their string-pulling.

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