Social Change in Gangetic Delta of India: a Participatory Rural Appraisal

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Abstract

Famous for the abode of notorious man-eating Royal Bengal Tiger Sundarban is largest delta and largest mangrove forest belt on earth. It is a UNESCO World Heritage Site. A participatory rural appraisal (PRA) was conducted (2003-04) in four purposively selected villages in Sundarban islands (Gangetic delta) of India to understand the social trend over a long period of time. PRA tools (oral history and time line) were applied to obtain information on various aspects of rural social life tracing back to the past. PRA reveals that rural people in Sundarban lived a tough life in recent past. Though a remarkable change in various aspects of village life has occurred in due course of time a lot has to be done to develop rural Sundarban compared with other developed regions of India. It was also observed that a little change has been brought by the programs planned and implemented by the government. It is recommended that before undertaking any program of promoted change perspectives of the villagers must be taken into consideration with an emphasis on environmental issues.

1. Introduction

Social change involves a change in the structure or function of social forms. Social change occurs in all societies; may be slow in primitive and folk societies and rapid in complex modern societies (Chitambar, 1997). Also change may be desirable or undesirable. And change may occur due to many reasons, e.g. natural calamity, political force, program of promoted change, etc. Whether man-made or natural, planned or unplanned, and desirable or undesirable, change is inevitable.

The study of social change is important for many reasons. It helps in evaluation of a program that has contributed to change as desirable or undesirable, in comparing the present with the past to plan and implement programs for improvement, and to know the origin and history of a society. Thus study of social change provides insight into the social reality in its historical perspectives. Above all it helps in realization of the socio-economic need of the people.

Spreading over two countries of India and Bangladesh Sundarban is a UNESCO World Heritage Site comprising a number of islands where the river Ganga meets the Bay of Bengal. It is the largest delta, largest mangrove forest area and one of the few existing mangrove eco-systems on earth.

Land mass here is situated below sea water level, for which embankment is essential for the very survival of its inhabitants. Land is highly fertile with silts deposited by the river Ganga, but due to regular inundation by tidal sea water salinity is a big problem. Typical geographical location coupled with poor transportation and communication facility has made the islands of Sundarban almost isolated and inaccessible.

Living in extreme difficulty facing a lot of problems here people work hard from dawn to dusk to earn a living. The socio-economic life of the rural inhabitants in Sundarban is traditional with gradual but slow impact of urbanization. However, it is evident that villages are changing (Chakrabarti, 1995; Chattopadhyaya, 1999; Das, 2005).

There is a dearth of literature on this important aspect of rural social phenomena especially from people's perspective. The present study was therefore undertaken during 2003-04 to gain an insight into the social and developmental changes in Sundarban region of India. It is expected that the rural social reality explored by the villagers will be helpful to the researchers, development professionals and policy makers for making appropriate intervention to bring desirable changes in the lives of the millions of people inhabited this UNESCO

World Heritage Site.

2. Materials and Methods

2.1. Study site

Sundarban forms the southern part of the Gangetic delta between the Hooghly river in the west in India and the Meghna river in the east in Bangladesh. Situated between 21°13'-22°40' N latitude and 88°05'-89°06' E longitude it is a system of islands formed by deposition of silt and sand where the River Ganga meets the Bay of Bengal. It spreads over an area of 20,400 km^2 of which $^2/_3$ belongs to Bangladesh, and $^1/_3$ belongs to India. Indian part of Sundarban covers an area of 9,630 km^2 comprising 19 Development Blocks (13 under South 24 Parganas and 6 under North 24 Parganas District of West Bengal State) and reserve forest. Of which 5,366 km^2 was reclaimed for cultivation and human habitation protected by embankments (3,500 km^2), and 4,264 km^2, including water bodies, are under mangrove forest encompassing the core area, the Project Tiger (tiger reserve), and Bird Sanctuary wherein 2,585 km^2 forms the largest Tiger Reserve and National Park in India. It has the status of Biosphere Reserve called Sundarban Biosphere Reserve. The Sundarban Development Board and Project Tiger under the Government of West Bengal (India) look after the overall development of the region.

There are 102 islands in Indian Sundarban of which 54 islands have human habitation supporting a population of about 4.1 m as per the 2001 census. Sundarban constitutes a special forest eco-system known as mangrove eco-system found at the land-sea interface of the tropical and sub-tropical regions of the world.

During colonial period the East India Company reclaimed land from mangrove forest. People hired from neighboring districts for reclamation were the first to settle in the region who belonged to lower socio-economic class mainly scheduled tribe (ST) and scheduled caste (SC). Later on many Hindu people from Bangladesh (earlier East Pakistan) also settled there at the time of separation during 1940s.

Agriculture, mainly mono-cropping, is the mainstay of economic life of the people in Sundarban (Chattopadhyaya, 1999; Das, 2005). Extremely poor communication facilities and dependence on water for transportation coupled with poor levee facilities make the region almost inaccessible during the rainy season.

Field research was conducted in 4 purposively selected villages based on location, livelihood, backwardness and caste. The 4 villages were Samser Nagar, Jemspur, Bagulakhali and Moukhali. Samser Nagar (Kalitala Gram Panchayat, Hingalganj Block, North 24 Parganas District) is situated at Indo-Bangladesh border beside the Kalindi river on the fringe of Sundarban Reserve Forest. Jemspur (Laheripur Gram Panchayat, Gosaba Block, South 24 Parganas District) too is a forest-fringe village. Inhabitants of these two villages depend heavily on forest and river for their livelihood.

On the other hand, Bagulakhali (Chunakhali Gram Panchayat, Basanti Block, South 24 Parganas District) and Moukhali (Tambuldaha-1 Gram Panchayat, Canning-2 Block, South 24 Parganas District) are non-forest fringe villages, hence no dependence on forest for their livelihood. Among the study villages, Bagulakhali is most well communicated with urban area and Samser Nagar is most interior village with poor conveyance facilities. Samser Nagar is dominated by SC and ST, Jemspur by SC, Bagulakhali by Bangladeshi, and Moukhali by Muslim people. Besides, Moukhali has a neighborhood (Noakhali Para) constituted by Bangladeshi people.

2.2. Data collection

Case Study method of PRA (Participatory Rural Appraisal) was used for data collection. Four case studies were conducted in four selected villages- Samser Nagar, Jemspur, Bagulakhali and Moukhali. Data were collected from villagers through time line and oral history.

Case study is a method of in-depth qualitative study of a social unit- an individual, family, organization, institution, group, village, district, or country (Young, 1996). Technically, case study is an empirical inquiry in which the number of variables exceeds the number of data points. It allows to retain the holistic and meaningful characteristics of real life events (Yin, 1993).

Participatory rural appraisal/participatory reflection and action (PRA) is a family of approaches, methods and behaviors that enable people to express and analyze the realities of their lives and conditions (Chambers and Blackburn, 1996). It provides an alternative method for data collection and analysis with an emphasis on qualitative information rather than quantitative information (Reddy, 1999).

When a case study method is essentially based on a participatory mode along with the principles of PRA it is called the Case Study method of PRA (Mukherjee, 1993).

2.2.1. Time line

Time line is used for tracing local changes in different variables over time such as food patterns, wages, days of work, kind of work, survival strategies, changes in vegetation, farming practices, livelihood, quality of life, etc. (Mukherjee, 2002). It provides an aggregate of the various landmark events as perceived by the local people. It gives historical profile of an individual, organization, village, institution or country (Kumar, 2002).

2.2.2. Oral history

Unlike time line, oral histories are more of broad overviews of social, ecological, and cultural issues. The local people describe changes in local conditions from a historical perspective. Thus it helps in providing a historical background to any issue (Kumar, 2002; Mukherjee, 2002).

2.3. Local units of measurements

1 *mon*=40 kg, 1 *basta* (gunny bag full)=1½ *mon*=60 kg. 1 *bigha*=33 *shatak*=20 *kotha*, 1 acre=100 *shatak*=3 *bigha*, 1 ha=750 *shatak*=7½ *bigha*. *Bigha* is the local unit of area measurement which varies from $^1/_3$ of an acre to almost one acre. The government standard *bigha* is 14,400 ft^2, i.e. $^1/_3$ of an acre. 1 *ana*=$^1/_{16}$ of ₹1. This unit of currency was used in earlier days, not in use now-a-days.

3. Results and Discussion

Socio-economic and developmental changes taken place in the villages within some years to decades are summarized below.

3.1. Social change in Bagulakhali village

Oral history by a 65-70 years old villager (Lalmohan Das)- a teacher by profession, and 55 years old widow (Harapriya Das) reveals the following.

Around 80-100 years ago, Bagulakhali village came into existence. At that time mostly *Adivasis* (native/tribal people) were residing in the village. There was *ulu* (aquatic plant) grass all around.

Around 15-20 years ago, there were many cattle and buffalo. Cobblers used to contaminate the grazing land with poisons to kill the cattle and take the skin for selling to earn a living. People lived in extreme poverty. Many years before that people used to eat *milo*/*bhutta* (maize), *tentul* (tamarind) seed and *ata* (coarse flour), *saluk* (aquatic plant), etc. ₹1 was paid for husking one gunny bag paddy in *dhenki* (husking pedal), and ₹0.25 was paid for winnowing one gunny bag rice.

₹0.50 to 1 was given as wage for performing various domestic works like crushing and grinding of dry chili and turmeric, making *chira* (flattened rice) in *dhenki*, preparing dung cake, etc. in neighboring households whole the day, with or without one time food. Wage for reaping paddy was ₹2-2.5 head^{-1} whole the day. Besides, table 1 gives insight into social reality as revealed through time line.

3.2. Social change in Moukhali village

Oral history on Moukhali village as narrated by a 65-70 years old widow, her 35-40 years old daughter-in-law and a 65-70 years old man explores the following.

Around 50-60 years ago, there was mangrove forest on opposite side of the river. River was wide, roaring and very deep. At present the river has gone further away from Noakhali Para (a neighborhood) becoming very much narrow. There was no tube well for drinking water in the village. Women used to

Table 1: Social change in Bagulakhali

Reference	Incidences happened
1962	Primary school was set up.
1988	Storm caused havoc throughout the area. Most of the homes were broken down including the primary school.
1990	First diesel operated electricity generator was introduced at Chunakhali Haatkhola.
1995	Sagar Gramin (rural) Bank opened a branch at Chunakhali Haatkhola.
1997-98	One tube well was set up in front of GP office adjacent to Chunakhali Haatkhola.
1998-99	One more tube well was set up by Rangabelia Rural Development Project of Tegore Society (an NGO).
1999-2000	The very first tube well was re-established at a place near river by GP.
2000-2001	GP office installed solar cell.
2001-2003	Solar cell and wireless in local loop (WLL/WiLL) telephone booth were introduced in Chunakhali Haatkhola. Additional block animal health centre was reopened at GP office building after remaining closed for 10-15 years. Opposite to Chunakhali Haatkhola, on the other side of the river, the secondary school in Shambunagar became higher secondary. A fishery came into existence in neighboring village. Around 5-6 households were rehabilitated in Bagulakhali by the fishery owner.

Source: Runu Das (25 years), Snehalata Das (45 years), Meera Das (35 years), Vikram Das (15 years), Prasenjit Das (15 years), Tanima Das (16 years); Method: Time line;
Note: Haatkhola=Local market. Chunakhali Haatkhola was nearest market for Bagulakhali village. GP=Gram panchayat=lowest level panchayati raj institution (democratic decentralization)

wear sari costed ₹7-8 each.

Around 35-40 years ago, there were 4-5 households in Naokhali Para. They used to fetch water filled in pitcher by boat from other side of the river. Shrubs of *halla* (mangrove species) existed all around which were utilized mainly as fuel. Villagers used to consume grinded corn twice daily as staple food. Besides, they also used to consume poor quality rice popularly known as *tenpel chal*, meaning 'train-fail rice' which was thick, apparently old and reddish in color. Boiled that rice (*chal*) was tasteless, not easily digestible and consumption of a small quantity yielded the feeling of full stomach. Moving and walking was difficult after eating the boiled rice.

Cultivation was almost not possible. Mustard oil was not available. Coconut oil was used for cooking. Oil from gule fish was also used in cooking. Leaves of palmyra and date trees, forest woods, *nonageri* (mangrove species), and bushes of *halla* were used as fuel. Value of agricultural land was ₹100 *bigha*$^{-1}$ (presently ₹20,000-25,000 *bigha*$^{-1}$). Wage for plowing (by bullock) one *bigha* land from 7 a.m. to 11 a.m. with food was ₹20-25 (presently ₹75 without food). A pair of bullock costed ₹1,000-1,200 and that of buffalo ₹500-700. Buffalo was left free round the year outside home except at the time when they were needed.

Around 20 years ago, the first tube well for drinking water was set up in the village, and around 10-20 years ago, fisheries came into existence along the side of the river. It has been around 4-5 years free livestock grazing has been stopped. Plowing was done exclusively by country plough till 2002-03. Only from 2003-04, plowing by power tiller has been started to some extent.

Cultivation of chili and lady's finger were started in 2003 and sesame in 2004 only. It has been three years sunflower cultivation has been started. Those who have access to pond water for irrigation started boro (summer) paddy cultivation 5 years ago. Presently, there are around 100 households in Noakhali Para alone.

3.3. Social change in Jemspur village

Table 2 highlights some of the social changes happened in the recent past as explored through time line.

3.4. Social change in Samser Nagar village

Oral history on Samser Nagar village as narrated by Nirad Baulia (28 years), Nimai Baulia (25 years) and their mother (55 years); and Haripada Mandal (50 years)- ex-*Pradhan* (President) and Panchayat Samiti (middle level panchayati raj institution) Member reveals the following.

Around 106 years ago, Samser Nagar was reclaimed from mangrove forest. A Muslim named Mirali Gaji (with his wife and three sons) was the first man to reside in the village.

Around 40-50 years ago, meat costed 6-8 *ana* kg^{-1}. Villagers accompanied by dogs used to hunt and kill deers in forest for consumption. Rice and pulses costed 6-8 *ana* and ₹0.50 kg^{-1}, respectively. Value of agricultural land was ₹100-150 *bigha*$^{-1}$, and one gunny bag paddy (60 kg) costed ₹50-60.

There was no tube well or water supplied through pipe line in the village. The very first tube well was set up in the village at Adivasi F. P. School in 1979. At the time of devastating storm of around 20 years ago, villagers used to fetch drinking water from a pond of Border Security Force camp which was 15-20 minutes walking distance from the village.

Around 15 years ago, a tiger from forest was straying into the village for about a month. Some livestock, but no people, were killed by that tiger. Again in the year 1995, a tiger was straying into the village continuously for some days. That tiger killed three people and some livestock. Both the tigers were killed by the villagers joining hands with Forest Department.

Around 10-15 years ago, villagers also used to fetch water from Chingrekhali Haatkhola at Kalitala, (1½-2 h walking distance from the village) by boat.

Around 2-4 years ago, forest boundary by the river side was fenced with nylon wire from Chingrekhali Haatkhola to Samser Nagar (10-12 km) to restrict the movement of tigers towards locality.

Around 2 years ago, one more tube well was set up in Shakunkhali Para (neighborhood) of Samser Nagar. Before that residents of Shakunkhali Para used to drink water from a tube well placed on the edge of a canal in the village. Water was coming out continuously round the year from that tube well which was around 1,500 ft deep. And that water was found inflammable which might be due to the presence of some kind of inflammable gas in the water. This tube well previously was in front of Adivasi F. P. School. Due to harmful effects of tube well water on cultivation, it was replaced at its present place (on the edge of the canal). Water coming out continuously from the tube well was running into the canal. Villagers also used this tube well's water for drinking purpose.

First man from Samser Nagar graduated in 1965-66. Among Muslims, two women were the first to pass secondary examination in 2001-02 and till date only one man among Muslims passed secondary examination.

3.5. Interpretation: analysis of four villages

The study provides valuable insight into the social and developmental aspects of the study villages. Storm and flood are common phenomena. Owing to coastal location every year during April-May cyclone coincided with heavy rainfall and full-moon-tide cause breach in embankments flooding many places of Sundarban. Drinking water is scarce in this region owing to salinity. Ground water is only available at around 1,000-1,500 ft deep, that too sometimes not safe. In Samser Nagar village, water was continuously coming out from the tube well which

Table 2: Social change in Jemspur	
Reference	Incidences happened
Around 20-25 years ago	Many cattle and goat were there in the village.
17 years ago	River water flooded the area breaking embankments. Many households, people and livestock were devastated.
Around 15 years ago	Storm caused havoc throughout the area. Many households, people and livestock were devastated.
Around 10-12 years ago	Gobar (dung) gas was introduced in the village.
Around 8-10 years ago	The forest along the river side was nylon wire-fenced by the Project Tiger to control the movement of tiger towards the village. Bi-scope was found to come in the area. Value of agricultural land was ₹28,000-30,000 bigha^{-1}. Presently, ₹20,000-25,000 bigha^{-1}.
8-9 years ago	A tiger strayed into Haren Mandal's house. No casualties (livestock or human) occurred.
Around 7-8 years ago	Honey-bee cultivators started coming in the village to place honey boxes in the households along the river side opposite to the forest. Cultivation by power tiller was started.
Around 5-6 years ago	River water flooded the area breaking embankments. Second cropping (vegetables, etc.) was not possible for about 2 years.
Around 4-5 years ago	Livestock grazing was restricted. Before that livestock grazed freely in the harvested fields.
Around 3-4 years ago	There was khonwar in the village. Rajatjubilee Secondary School (about15-30 minutes walking distance from the village) became higher secondary.
Around 2-3 years ago	A tube well for drinking water was set up at Patharpara (15-20 minutes walking distance from the village). Before that most of the people used to drink pond water.
2 years ago	Chili was cultivated extensively. Cultivation of pulses (chaite moong dal) started extensively. Sunflower cultivation was also started to some extent.
Around 1-2 years ago	Stubble obtained from harvested paddy field was used as fuel. At present paddy is cut from the ground to make bichali, hence stubble is not available.
Source: Bidhan Mandal (35 years), and Nirapada Majhi (45 years)- ex-Pradhan (President) and Panchayat Samiti (middle level panchayati raj institution) Member; Method: Time line	

was inflammable. It is a fact that still old people prefer pond water for cooking and drinking treated with alum. The study of social change also explores that brakish-water fishery is prevalent in the study villages. In fact large-scale commercial fisheries by controlled inundation of vast track of agricultural field surrounded by ring bund have become a characteristic feature of rural Sundarban (Chattopadhyaya, 1999; Bandyopadhyay, 2000; Sinha, 2007). Installation of diesel operated electricity generator and solar cell was important developmental phenomena in the study villages. At present local markets (Haatkhola) of all the study villages have electricity supply. Even Bagulakahli village has electric connection. Modern telecommunication facility was a far cry for the villagers of Sundarban. Introduction of telecommunication in WLL mode is a great achievement in the rural society of Sundarban. However, at present mobile telecom services are available even in remote villages of Sundarban, though land-line telecom services are rarely available except government offices and progressive areas. Time line and oral history also reveal that forest-fringe villages are confronted with tiger straying into the villages on many occasions. Therefore, fencing was done in forest-fringe villages to restrict the movement of tigers towards the village. Protection of villagers' lives and their livestock from tiger and conservation of tiger is a mammoth task being carried out by the Project Tiger. Interestingly, though mechanization in agriculture was started in India during 1960s, but it has been introduced in the study villages only recently. It reflects that the study villages have been less affected by green revolution.

4. Conclusion

The present study reveals that socio-economic life of the people in study villages was predominantly rural with a gradual

but slow pace of development. It was also observed that developmental interventions undertaken by government have been limited mainly to meet the basic need of drinking water, education, etc. Indeed, people live a tough life facing extreme difficulty and poverty. It seems that typically inaccessible geographical location, water based conveyance, and muddy roads are the factors behind the process of delayed socio-economic development. Construction and maintenance of brick roads, embankments and tube well, and supply of electricity are the most important developmental challenges in the study villages. A lot is required to be done to develop rural Sundarban. It is recommended that any type of developmental intervention must consider the perspectives of the villagers with due emphasis on ecology, eco-system and environmental issues of this vulnerable and fragile delta.

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