



Institutions and Governance in Fisheries of Indian Brahmaputra River Basin

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ABSTRACT

Riverine fisheries are of great importance in the tropical regions of the earth as they provide food and nutrition to millions of people and support their livelihood. Brahmaputra is one of the largest rivers of the world having a drainage area of 580,000 square kilometers. Institutional arrangements have been compared in two river stretches and wetlands under different management regimes, namely: (i) open access (North Lakhimpur district); (ii) Fishermen cooperative (Kamrup district); and 15 floodplain wetlands (in three districts) under Individual, cooperative and open access. The open access regime has no institutional arrangements, while for cooperative and individual regime, the river and wetlands were leased out for 7 years. The ownership of riverine stretches of Brahmaputra lies with department of revenue, while the ownership of floodplain wetlands under various government departments. The study concluded that involvement of actual fisher institutions fisheries may be encouraged for better fisheries management. A need was also felt for periodic evaluation of these institutional arrangements towards their performance and natural resources use. The inclusion of the entire actor group and the presence of active linkages within and among them will strengthen governability.

Keywords: Fisheries, Property rights, Common property resources, Brahmaputra basin, Floodplain wetlands, governance

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INTRODUCTION

The Brahmaputra is one of the world's largest rivers, with a drainage area of 580,000 sq. km. (50.5% in China, 33.6% in India, 8.1% in Bangladesh and 7.8% in Bhutan). In India, its basin is shared by Arunachal Pradesh (41.9%), Assam (36.3%), Meghalaya (6.1%), Nagaland (5.6%), Sikkim (3.8%) and West Bengal (6.3%). It traverses 1,625 km. in China and 918 km. in India, before flowing 337 km through Bangladesh and emptying into the Bay of Bengal through a joint channel with the Ganga. In the course of its 2,880 km. journey, the Brahmaputra receives as many as 22 major tributaries in Tibet, 33 in India and 3 in Bangladesh. The north-eastern region of India, is dotted with a large number of floodplain wetlands or beels, (Goswami and Das, 2003).

Riverine fisheries are of great importance in the tropical regions of the earth as they provide food and nutrition to millions of people and support their livelihood. However, multiple demands of water for irrigated agriculture, domestic and industrial supplies and hydropower generation have highly impacted the river flows and riverine habitats and consequently the fisheries and riverine-fishers. Traditionally, the rivers are managed as common property resource. The residents of riparian areas have the customary ownership of local river stretch as social units with definite membership. The decline in riverine fishery is a global phenomenon, but the pace and implications had been varied across rivers in different continents and within a continent. Recent survey of River Brahmaputra in Assam revealed a significant decline in

the fish catch in its many stretches from the period 1973 to 2000. On the whole, there was a 30% decline in the catch of Indian major carps. The minor carp, hilsa and prawns declined significantly during the period (Pathak, 2000).

A large number of investigations on fisheries of Brahmaputra River and associated floodplain wetlands were undertaken (Jhingran, 1991; Phukon and Biswas, 1991; Yadava and Sugunan, 1992; Biswas, et. al., 1995; Biswas and Boruah 2000; Pathak, 2000; Sugunan and Bhattacharjya, 2000; Boruah and Biswas, 2002; Vinci et. al., 2003; Chandra, 2007; Chandra, 2008; Chandra, 2009a; Gurumayum and Choudhury, 2009; Chandra, 2010a; Chandra and Sharma, 2011b; Vass et. al., 2011; Chandra, et al., 2013). The institutional arrangement and governance of fisheries in Brahmaputra River basin and associated water bodies are scarcely addressed (Chandra, 2009b; Chandra, 2010b; Gupta and Lebel, 2010; Chandra, 2011; Chandra and Sharma, 2011a; Chandra and Sharma, 2011c; Vass, et al., 2011; Katihet. et al., 2013).

The objectives of this study are to i) review the institutional arrangement and governance, ii) formation of ownership and allocation rights, iii) identify the major issues, challenges, concerns and choices for sustainable management of fisheries.

MATERIALS AND METHODS

The present paper has been made on the basis of the experience and understanding developed in the context of the fisheries management in Brahmaputra River and its associated floodplain wetland of Assam from 2004 to 2012. To address institutional issues, two stretches of Brahmaputra River systems under different management regimes, namely:

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(i) open access (North Lakhimpur district); (ii) Fishermen cooperative (Kamrup district); and 15 floodplain wetlands in Nagaon, Barpeta and Morigaon district under individual, cooperative and open access regimes were selected. Both primary and secondary information was collected from these river stretches and wetlands to cater to the needs of objectives. The governmental acts and other orders were also appraised. To understand the institutional arrangements in riverine and wetland fisheries this information was analysed. Focused group discussion using participatory techniques was also used to gather information from lessees of wetlands (Chandra, 2010c).

The fisheries institutional arrangement has been analyzed in light of the underlying foundation of the state's philosophy of balancing economic growth with welfare and sustaining vital resources, highlighting the role of the state in explicating the political economy of inland capture fisheries in Brahmaputra River and associated wetlands (Chandra, 2011). The main focus of the study was to address the following relevant research questions i) how the formation of the ownership and control rights in fisheries of Brahmaputra River and associated floodplain wetland has been made?, and ii) how the legal agreement and the legal framework supports the access and allocation?

RESULTS AND DISCUSSION

Socio-economic condition of fishers

The total population of fishermen in Assam basin is 0.75 million. Livelihood of fishers' family of Assam from time immemorial is dependent upon fishing in river and floodplain wetlands. There are 356 fishermen cooperative societies registered in the state with a total membership of 44,000 fishers. The age distribution of the fisher community showed comparatively higher proportion of minors. Most of the families are nuclear. The average family size is 5.26 members per family. Adult-children ratio in Nagaon, Barpeta and Morigaon district was 52:48, 82:18 and 65:35 respectively. Literacy rate among the fishers community is 75%, which is better than the literacy rate of Assam (73.18) and India (74.04) as per the 2011 census. 21.57, 50.20 and 2.90 percent of the fisher household members have passed primary, secondary and collegiate level respectively. Housing characteristics are the one of the major indicators of standard of living. 60% of the fishing community lived in hut and kaccha houses. The primary occupation of the fishermen was fishing and secondary wage earning. In terms of possessing Gears, most of the fisher families have nets mainly gill and drag net. The weekly income profile of the fishers shows 74 percent of it derived from fishery profession.

Institutional Arrangement

The property rights are the fundamental institutions of allocation and access. Various factors like size of the river stretch and associated floodplain wetlands, traditional and customary rights, physiographic dimensions, accessibility and river connection etc. are the determining variables for the nature of property rights (Chandra, 2009b; Chandra, 2011). The river stretch and wetlands are managed for various objectives like economic benefit, livelihood security, sustainability, equity, conservation of biodiversity,

maintenance of the ecosystem etc.

In most of the associated water bodies of Brahmaputra River and floodplain wetlands, customary rights of the tribal and other indigenous ethnic groups are safeguarded legally (Phukan, 2006). These rights are for species, gears and purpose specific. The use of small gears and other small nets are free from any control. These rights are limited for self-consumption only. The marginal areas of wetlands are become open after the harvesting season and women fishers usually fish in these areas. The access to the fisheries is predominantly governed by the lease holders but the traditional rights of access are also been integrated in the property rights.

Stakeholders

Diverse interests of and little joint coordination among river basin stakeholders on international, national, and interstate level, but also among different State departments and local stakeholders result in a complicated institutional environment often without joint planning. On Brahmaputra river basin level, a large number of stakeholders are involved namely Government of India through its various departments, Govt. of Arunachal Pradesh, Govt. of Assam, local bodies, regulatory bodies, NGOs, farmers, Fishermen, and other end users.

Apart from the basin level, a large number of stakeholders also play its part on floodplain wetland fisheries sector of the Assam basin (Chandra, 2011). Each of the stakeholders operates at different level of management. Interventions in the management process which focus solely on a particular user community, or even on a user community and the relevant government agency, are often undermined by parts of the wider community that have not been included in project design considerations. Among different stakeholders the fishers constitute the most important stakeholders as the life and livelihoods of them are dependent on the resources.

Access and Allocation

Access and allocation are closely intertwined. Political scientist define these in terms of who gets what, when, where and how. Legal experts focus on norms and normative forcing. Economists focus on markets and pricing mechanisms. Sociologists define in terms of how justice is locally negotiated and the role of social relations in this (Dryzek 2000; Elster 1992, 2006). The public trust doctrine allows government to lease, grant, and sell public resources as long as it does not unduly harm public interests. Lease of fisheries means assigning rights (property, use) to individuals, groups, cooperative, or communities. Property is composed of a bundle of rights (access, withdrawal, exclusion) that can be allocated to users. The Assam government focus on revenue generation along with welfare measures of fishers' community has implication on the allocation and withdrawal rights. In the past, an individual fisherman held only one exclusive right: the right to own the fish he caught. Other rights were held in common. As fish became scarce and competition and conflict increased, the need to regulate prompted rules such as gear restriction or closed fishing season. The Brahmaputra River and associated floodplain wetlands in Assam can be categorized on the basis of ownership in two categories Government fisheries and Private fisheries. The ownership of floodplain wetlands comes under the different government departments' viz.

Department of fisheries, revenue department, department of forest, Assam fisheries development corporation (AFDC), Gram Panchayats etc. (Fig. 1 & 2). The formation and the

transfer of fishing rights are determined through either tendering methods or direct transfer based on the criteria by different departments of governments (Table 1).

Table 1: Formation of the ownership and control rights in Fisheries of Brahmaputra River and associated floodplain wetland

Controlling agencies	Purpose	System of transfer or license		Criteria for selection
Department of Revenue	Collection of revenue: Utilizations by fishing populations	Open tender system price fixed on the basis of produce in one year till January 31 st	7 years	Highest bidder or to Fisherman Cooperative if within 7.5% range of highest bid
Dept. of Fisheries	Collection of revenue; Utilization by fishing populations	tender to highest bidder to fishermen community or fishermen Cooperative	7 Years	-do-
Assam Fisheries Development Cooperation	Development of fisheries; Better utilization by fishing populations	leasing by tenders to fishermen community or fishermen Cooperative	7 years	-do-
Dept of Environment & Forest	Conservation of the resource, Protection of wild life	wetlands are not given on lease and fishing is only restricted for locals for sustenance	No license	
Village Panchayat	Betterment of the fishing populations; Revenue collection	Direct transfer or limited tenders to the villagers or individuals	7 years	Local fisher cooperative or beel development committee

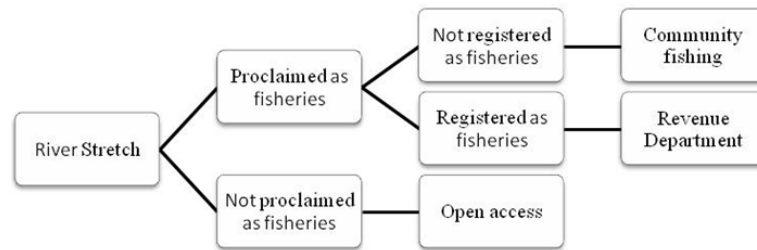


Fig. 1: Formation of Ownership and Transfer of fishing rights in Rivers stretches of Brahmaputra River

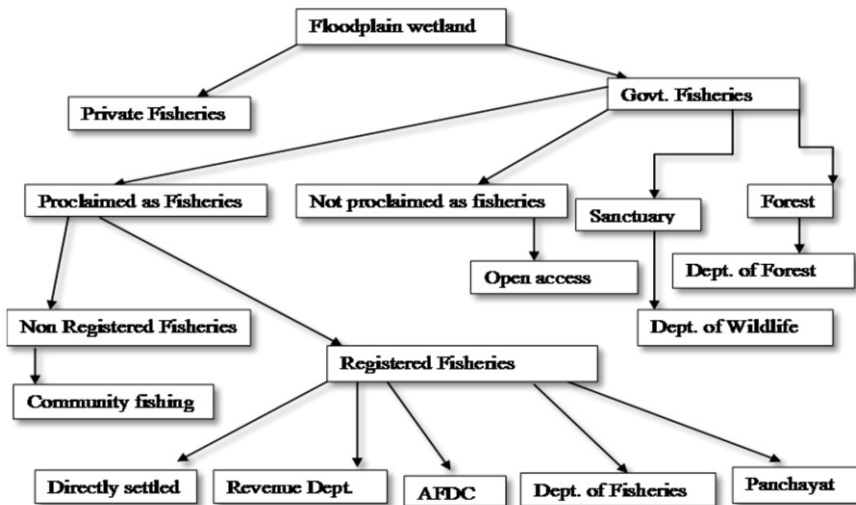


Fig 2: Formation of Ownership and Transfer of Fishing Rights in floodpalain wetlands of Brahmaputra basin

Leasing system and management rights

The management rights of registered fisheries of river and wetlands were given on lease to the highest bidder (either individual or Fishermen Cooperative society). The lease of the registered wetland is given only to fishermen. The term fishermen in Assam include the persons belonging to the schedule castes, community (Maimal community in Barak Valley) and defined and engage themselves in any of the following profession (Chandra, 2011)

- i. That the persons undertake fishing by themselves in a fishing group
- ii. That the persons directly undertake fish trade such as marketing of fresh fishes, preserved fishes, other preserved fishes, fishing implements etc.
- iii. Members of the fishermen cooperative societies undertaking fishing or fish trade etc. as in (ii) above.

Fisheries Management

Fisheries management system based on the access and allocation rights for river fisheries is either in the hand of Private management (individuals and groups), or the primary fishermen cooperative society (PFCS), and open access in those areas where the water is not registered mainly in tribal belt and zone of forest. In open access, the riverine fish biomass has a free access to any one. There is a free entry to riverine fishing, which allows anyone to fish anywhere, anytime. Under the co-operative management regime, state government leased out the stretch to fisheries co-operative societies, and conferred all the rights and powers of decision-making regarding fisheries in the stretches to co-operatives. The PFCS is formed only with more than ninety percent membership from the fishermen community. Generally, the stretches were leased for seven years. The members of society have the right to fish and exclude non-members from fishing. The non-members have the duty to abide by this exclusion. The only difference between cooperative and private management regime was that fishing rights and power to transfer fishing rights and decision making rested with the individual to whom the stretch was leased out in the later case. Apart from the three types of management regimes mentioned above, one more kind namely community-based fisheries management (decentralized management, government works as facilitator) exist in floodplain wetlands.

Benefit sharing arrangement

In Cooperative managed regimes, the benefit sharing was in the ratio of 50:50 for all kind of benefits. In individual managed wetlands, sharing arrangement was 60: 40 between lessee and fisher with stocking practices and 50: 50 in non-stocked floodplain wetlands. In terms of fishing practices like katal fishing on both cooperative as well as individual managed floodplain wetlands the benefit sharing arrangement was more in favour of fishermen than the lessee.

Legal Agreements and framework available

The legal framework at various levels, international, national and state level governing interstate water river water basins management and fisheries in the Northeastern India are outlined below.

1. *INTERNATIONAL AGREEMENTS*: (Stockholm conference 1972, earth summit 1992, World summit on sustainable development, Johensberg, 2002, Ramsar

Conventions)

2. *CONSTITUTIONS OF INDIA*:

Article 262 (1): Parliament may by law provide for the adjudication on any dispute or complaint with respect to the use, distribution or control of the waters of, or in, any inter-state river or river valley.

(2) Notwithstanding anything in this Constitution, Parliament may by law provide that neither the Supreme Court nor any other Court shall exercise jurisdiction in respect of any such dispute or complaint as is referred to in clause (1).

Entry 56 in Union list: "Regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest."

Entry 17 of state list: "Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of entry 56 of List I."

Directive Principles and fundamental duties

3. *ENVIRONMENTAL LAW OF INDIA*: wild life protection Act (1972), Water (preventions and control of pollutions) Act 1974, Water (Prevention and Control of Pollution) Cess Act, 1977, Air (preventions and control of pollutions) Act 1981, environment (protection) Act 1986, EIA 1994
4. *RIVER BOARDS ACT 1956*
5. *NATIONAL WATER POLICY 2002*
6. *INDIAN FISHERIES ACT 1897*
7. *INLAND WATERWAYS AUTHORITY OF INDIA ACT, 1985* for national water way No. 2 from Dhubri to Pandu (Guwahati) a 260 km stretch
8. *ASSAM LAND AND REVENUE REGULATION ACT 1886*: land-proprietor, landholders and settlement holders and waste land regulations
9. *ASSAM FISHERIES RULES (1953)*
10. *ASSAM PRIVATE FISHERIES PROTECTIONS ACT 1935*
11. *ASSAM FISHERIES DEVELOPMENT CORPORATION RULES (AFDC)*
12. *ASSAM PANCHAYAT RAJ ACT 1994*
13. *OTHER GOVT ORDERS* time to time issued by the government of Assam

Challenges, Concerns and Choices for sustainable fisheries

Fishery systems are not recognized as ecological and scientific only, but also social, economic, institutional, and political requiring processes involving societal values and issues of social justice and equity (Garcia and Charles, 2007). All the challenges faced by river and wetland fisheries in turn raise the concerns of ecosystem health, social justice, livelihoods and employment, and food security and safety. Changes in livelihood outcome resulting from specific mechanism of access may result in increased access to existing resources, access to new resources and the establishment of new mechanism, for example through the application of new technologies (Franks and Cleaver, 2007). The challenges, concern and choices that affect the fisheries of Brahmaputra River and associated floodplain wetlands are discussed in Table 2.

Table 2: Challenges Concern and Choices for Fisheries in Brahmaputra river system

Situation and trends	Challenges	Concerns	Choices
Overexploitation of fisheries resources - catch per unit effort decreasing	Exploited ecosystem- no consensus of restoring it	Managing the ecosystem health	Short term versus long term use of fisheries
Increasing in the number of people employed in fishing	Exploiting market while protecting interest of fishers and consumers	Increasing share of fishers in consumer rupee	Small scale versus large scale operation
Other use of wetlands (other than fisheries)	Balancing profit and cost to society	Social justice through providing more option to fishers	Fisheries versus ecotourism
Involvement of a large number of middle man	Sustainable fisheries		Community based versus individual based fisheries
Decreasing Area of Wetlands	Siltation and conversion of marginal area for other uses	Livelihood security of the fisher community	Protecting fishers' interest.

CONCLUSION

Brahmaputra River and associated floodplain wetlands in Assam are dynamic resources where a large numbers of actors operate for gaining access and livelihood. Understanding various stakeholders and its involvement in the management is important for bringing them into governance. The inclusion of the entire actor group and the presence of active linkages within and among them will strengthen governability. One of the ways towards better management is to shifting of fishing regimes from open access to limited access or common property with fisher participation, and traditional/customary fisheries management arrangements of cultural and religious value should be supported. The fisheries as multiple use and

multiple users systems operate in an environment of multiple and conflicting objectives. The need of the hour is that the governance system needs to deal with diversity, complexity, dynamics and the varying scales of action. Improved governance systems are critical for ensuring that the regulatory frameworks for defining and legitimizing the reformed institutional arrangements should translated into meaningful outcomes.

'BrahmaputraMahabahuSantanuKulanandana

AmoghagarbhasambhutapapamLauhitya me hara'

('O Lauhitya, the large-armed son of Brahma, born as a son in the family of Santanu, from the womb of Amogha; kindly remove my sin') (From Smriti works in Sanskrit language)

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