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COMMUNITY DYNAMICS OF AQUACULTURE AND FISHERIES TECHNOLOGIES AT INUNDATED ZONES OF JESSORE IN BANGLADESH

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ABSTRACT

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A set of research work conducted on community dynamics of aquaculture and fisheries technologies at inundated zones of Jessore region of in Bangladesh with the major objectives to identify the characteristic status of fisherman communities, and to know the prime features of community operation, and specifying the priority improvement scopes through skill training and its utilization in the forms of integrated professional community dynamism. The sites selected for the studies were Jessore, Jhenaida, Magura, Meherpur, Kustia, Sirajgonj, Pabna, Rajbari and Natore Districts and the AEZ were AEZ 5, AEZ 7, AEZ 10, AEZ 11, and AEZ 12. The questions for investigation were set as per objectives keeping in mind the situation and respondent categories. The result reveal that the participants were mostly dominated by mid-age reaching school dropouts which is slightly lower than the average status of the developing even Asian countries. The result showed that so many respondents are interested to advise the fisher for fishing but well wishers were not interested to fishing by themselves which indicates a clear less favourable dynamism for fisheries community development. It was recommended that the fishermen should be well defined having direct fishing livelihood The wards of fishers must be accept the profession in the manner of sustainable dynamics. At least 70% income should be reinvested in the fisheries sector by the fishers. Intensive skill training in the forms of Information Based communication Technology (IBCT) and AEZ using multimedia should be given to the fishers on both technologies and community operations.

Key words: *fisher and fisherman, community dynamics, fisheries IBCT technology*

INTRODUCTION

Bangladesh is naturally and bio-physically with significant aquatic resources. There are inland open water, inland closed water, vast marine and coastal water and seasonal floodplains. There are more than 2, 7 million hectares floodplains in Bangladesh. These floodplains are inundated during the rainy season and retain waters about three to four months and in some areas about 6-7 months for a depth of 90 to more than 300 cm. In the recent years, aquaculture in the seasonal floodplains became very popular in some parts of Bangladesh. In the year 2011-2012, fish production from the seasonal floodplains was about 0.7 million metric tones (Azad 2013; BBS 2013). In Bangladesh, floodplain aquaculture is done mainly in the medium low lands rice field. The community people grow crops there in the dry season and alternately produce fish in the rainy season. The land owners of the community get two types of benefit from the project. They get share benefit from the fish and on the other hand, their crop production become higher as the fertility of the land increased due accumulation of fertilizer and manure from fish culture system. Others with lands in the lowland areas usually grow rice during the monsoon months or in the periphery of the floodplains that receives water. They benefit from fish production without hampering their crop production. The project has introduced water control measure that enabled the floodplains to function as a water reservoir. Thus, households who have access to lands in higher elevation areas benefit for crop production by getting a supply of water thought supplementary irrigation. In addition to fish production and water management for rice production, households also collect aquatic weeds and aquatic animals other than fish from the floodplains.

The households of the seasonal fishers who were mainly landless fully depended on fishing in the floodplains for their livelihoods during monsoon season. Due to regulation and conservation measures the availability of un-stocked small fish in the floodplains has increased, which has resulted in a bigger catch of seasonal fishers using local gears. Floodplains aquaculture distributed throughout 30 Agro-Ecological Zones (AEZ) of Bangladesh (BARC 1990; NARS 2012) contribute a lot in our rural economy not only by producing fish but also by creating employment of the rural people during lean period, generating backward and forward linkage activities and also by developing rural entrepreneurs. Floodplain aquaculture in Bangladesh is mainly community-based. At the beginning, the local community people formed an association on the basis of benefit sharing among the stakeholders. The benefit also varies according to resource contribution of the stakeholders. There are land owner's share, active labor's share, and active fisher's shares. In the context the present research program was developed and conducted on community based fisheries management prevailing on the Extension of aquaculture Technologies (Hussain 1995; Jul-Larsen and van Zwieten, 2002) which were also stated to be at per with the inundated zones of Jessore Region situated at the West and South areas of Bangladesh (Hossain *et al.* 2007; Khan 2008) with following specific objectives such as to: i. identify the characteristic status of fisherman communities, ii. know the prime features of community operation, and iii. specify the priority improvement scopes.

MATERIALS AND METHODS

The methods and materials used in the studies included technical investigation along with focus group sessions as per specific questionnaire guidelines in the format suitable for analysis.

Sites and Sampling

The approach methodology used in the present studies were formulated as per guideline recommended by Hansen and Mustafa (1992). The Agro-Ecological sites were selected and characterized as per the reports given by BARC (1990) NARS (2012).

Sites: The sites selected for the studies were such as Districts: Jessore, Jhenaida, Magura, Meherpur, Kustia, Sirajgonj, Pabna, Rajbari and Natore. Agro-ecological zones the study areas were:

Agro-Ecological Zones (AEZ)

AEZ coverage: AEZ 10, AEZ 11, AEZ 12, AEZ 5, AEZ 7

Interviewee: Community Fisherman, Community elites, and GO/NGO service providers.

AEZ and site Upazila

1. AEZ 10 –Active Ganges Floodplain: Iswardi, Sujanagar
2. AEZ 5- Atrai Basin: Natore Sadar, Gurdaspur, Singra
3. AEZ 7- Active Brahmaputra Floodplain: Serajganj Sadar, Belkuchi, Chouhali
4. AEZ 12- Lower Ganges Floodplain: Pangsa, Gualanda, Sripur
5. AEZ 11: Ganges Floodplain: Jessore Sadar, Keshabpur, Monirampur, Mahespur, Gangni, Kushtia Sadar

Part I: Personal information

Name----Identity of community ---Duration as community member--yrs

Address: Upazila : -- District :-- AEZ: --Sub-zone- Age: -Gender-- Training --weeks, Qualification.

Category of respondent: Community Fisherman, ii. Community elite, and iii. GO/NGO service providers.

Part II: Farm Information

1. Site of farming: i. River ii. Canal iii. Cluster Ponds iv. Baor /beel
2. Training received on : i. No ii. Fisheries techs iii. Community dev iv. Fish business
3. Size of the water areas : i. 10 acre or less ii. 10-30 acres iii. 30-50 acres iv. 50 acres or more
4. Duration of community operation: i. 1 yr or less ii. 1-3 yrs iii. 3-5 yrs iv. 5 yrs or more
5. Community participation : i. Beneficiaries ii. Member iii. Representative iv. Well wisher
6. Investment sharing Tk of farming: Thousand- i. 1 or less ii. 1-3 iii. 3-5 iv. 5 or more
7. Fisheries technology user efficiency: % of required i. 20 or less ii. 20-40 iii. 40-70 iv. 70 or more

Part III: Research -Technology Questions

1. Time in hrs/ wk spend for community actions i. 5 or less ii. 5-10 iii. 10-15 iv. 15 or more
2. Time in hrs/ per wk spend in doing prod works i. 5 or less ii. 5-10 iii. 10-15 iv. 15 or more
3. Cost of livelihood shared from community farms %. i. 20 less ii. 20-40 iii. 40-70 iv. 70or more
4. Farm income reinvest for further dev %. i. 20or less ii. 20-40 iii. 40-70 iv. 70 or more.
5. Main problem of the dynamics. Lack of i. Cooperation ii. Cognigence iii. Sincerity iv. Skill
6. HR type need for more income i. Training ii. skill iii. Awareness iv. Education

Part IV: Research-Agree

1. Agree that disintegration in fish culture, harvest and marketing sectors

i. Absolutely No ii. No with condition iii. Yes iv. Yes with condition

2. Agree that local community interests not considered in government policies

i. No ii. No with condition iii. Yes iv. Yes with condition

3. Agree that fishing profession as a members for a longer period is accepted?

i. No ii. No with condition iii. Yes iv. Yes with condition

4. Agree that wards accepted the fishing profession as a community members?

i. No ii. No with condition iii. Yes iv. Yes with condition

5. Think that community farming will sustain with the present strategies?

i. No ii. No with condition iii. Yes iv. Yes with condition

6. At which capacity participation is more contributory to the fishing community?

i. As a general member ii. As a committee member iii. As head of the committee

RESULTS AND DISCUSSION

The result obtained on the composition of population studies are presented here both in tabular and graphical forms along with essential interpretation. The results included composition of the site based sample population studies, Community characteristics, Farm information and community dynamics.

Composition of the Sample Population

The composition of the population sampled for the studies are mentioned in the Table 1. The results as regards age and education of the population among other characters show that the respondents of the age group in the

range of 40-55 yrs were highest for fisherman was 40.5 percent. It indicates that the mid-age persons are controlling the fishing sector. As for education 51.5 percent of the fisherman population had education in the range of class v to class x.

Table 1. Age group and education of the population studied

Study Population Composition	Age group = 40-55 yrs					Education Class V-X				Mean
	AEZ 10-Active Ganges FP	AEZ 11-High Ganges FP	AEZ 12-Lower Ganges FP	AEZ 5-Atrai Basin	Mean	AEZ 10-Active Ganges FP	AEZ 11-High Ganges FP	AEZ 12-Lower Ganges FP	AEZ 5-Atrai Basin	
Community Fisherman	38	43	32	49	40.50	54	57	48	47	51.5
Community Elites	29	31	28	23	27.75	38	36	46	51	42.75
Extension Agents	18	16	21	15	17.50	17	21	23	14	18.75
Mean	28.33	30.00	27.00	29.00	28.58	36.33	38.00	39.00	37.33	37.67

The result reveal that the participants were mostly dominated by mid-age reaching school dropouts which is slightly lower than the average status of the developing countries (Jul-Larsen and van Zwieten, 2002).

Characteristic features of the Community

The characteristic features of the community identified from the studies as per different sites (Table 2) show that it significantly differed in terms of land and water qualities and age-education status. From the table of community characterization AEZ basis it was found the char communities deal with open water bodies, age groups medium and education at low level. Old communities deal with old Baor, age group high education level also high. River bank community's deal with open+ leased closed water bodies with medium age and education. Beel Baor Communities works in semi closed water bodies having low age and medium education.

Table 2. Community Characterization: AEZ basis

AEZ Category	Land Area	Jessore Site	Water Body	Fish Community Age Group	Fish Community Eduction
AEZ 10-Active Ganges FP	Char communities	Jessore North East	Open water	Medium	Low
AEZ 11-High Ganges FP	Old Communities	Jessore West	Baor old	High	High
AEZ 12-Lower Ganges FP	River bank Communities	Jessore East	Open + leased closed	Medium	Medium
AEZ 5-Atrai Basin	Beel Baor Communities	Jessore North	Semi closed	Low	Medium

Fish Farm Information

The features of the fish farms studied as regards community duration 3-5 yrs and Size of water (10-30 acre). Mentioned in the Table 3 showed clear Agro-Ecological Zone based diversities. The farm information collected from the fisheries community's group shows that the community duration 3-5 years size of water bodies 10-30 acre, high in AEZ-5 in case of community Fisherman and low in AEZ-11. In case of community elites it was found to be higher in AEZ-5 low in AEZ-11. Extension agents were found to be more active in AEZ-5 and low in AEZ-10. The results mostly agree with the AEZ database of BARC–NARS, Ministry of Agriculture indicating that the BARC AEZ Guides may satisfactorily used for fisheries research and development (BARC 1990 and NARS 2012).

Table 3. Fish farm information

	Comm Duration 3-5 yrs				Mean	Size of Water 10-30 acre				Mean
	AEZ 10-Active Ganges FP	AEZ 11-High Ganges FP	AEZ 12-Lower Ganges FP	AEZ 5-Atrai Basin		AEZ 10-Active Ganges FP	AEZ 11-High Ganges FP	AEZ 12-Lower Ganges FP	AEZ 5-Atrai Basin	
Community Fisherman	48	23	39	58	42	63	25	55	67	52.5
Community Elites	39	24	34	27	31	47	28	53	71	49.7
Extension Agents	28	36	34	27	32.2	37	29	43	64	43.2
Mean	38.3	27.6	35.6	37.3		49	27.3	50.3	67.3	

Community Dynamics

The results obtained from the community dynamics as per positive responses are given in the Table 4, 5 and 6 and the Fig. 1 and 2.

Table 4. Community Dynamics

Zone	Respondents	Beneficiaries	Members	Representatives	Well-wisher	Mean
Jessore	Community Fisherman	49	22	51	53	43.75
	Community Elites	39	36	20	59	38.50
	Extension Agents	48	35	31	22	34.00
Jhenaidah	Community Fisherman	41	23	52	33	37.25
	Community Elites	38	54	34	57	45.75
	Extension Agents	53	36	42	44	43.75
Magura	Community Fisherman	48	17	39	38	35.50
	Community Elites	27	42	32	64	41.25
	Extension Agents	55	33	47	45	45.00
	Mean	44.22	33.11	38.67	46.11	40.53

Positive Response in percentage

Fisheries community dynamism results showed (Table 4 and Fig. 1) that in Jessore among community fishermen well wisher is high 53, where as representative 51, Beneficiaries is 49 and member 22. Among community elites well wisher is 59 also high among extension agents Beneficiaries 48 was high and well wisher 22 was low. In Jhenaidah among community fishermen representative was high 52 among community elites well wisher was high 57 among Extension agents Beneficiaries was high 53. In Magura among community fishermen Beneficiaries is high 48, among community elites, well wisher was high 64 among extension agents Beneficiaries was higher as being 55%. Here, it may be found that in community dynamics influenced by well wisher is higher; it is due to less attraction and less favorable enterprise for many people category. But as the sector is very essential for their livelihood but the well wisher group can't give their physical efforts. Similar results were also reported by many workers including Kuperan *et al.* (2003) and Kuperan (2006) but those were not Environment based and not specific to fisher communities like Bangladesh.

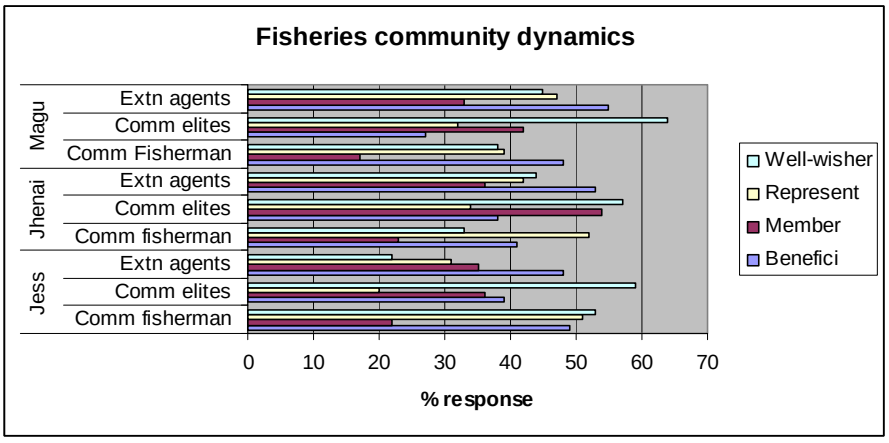

Fig. 1. Fisheries community dynamics

Table 5. Community Dynamics: Mean of respondents

		Mean
Jessore	Community Fisherman	43.75
	Community Elites	38.50
	Extension Agents	34.00
Jhenaidah	Community Fisherman	37.25
	Community Elites	45.75
	Extension Agents	43.75
Magura	Community Fisherman	35.50
	Community Elites	41.25
	Extension Agents	45.00

In Jessore (Table 5 and 6 and Fig. 1 and 2) community fishermen response was 43.75 , communities elites was 38.50 extension agents was 34.00 in which community fishermen was high followed by community elites. In Jhenaida community fishermen respondents 37.25 community elites 45.75% and extension agents 43.75 where community elites is high and community fishermen is low. In Magura community fishermen respondents was 25.50 community elites is 41.25 and extension agents 45 which is higher than other two. It was found for their role that in Jhenaida and Magura community elites and extension agent was higher than community fisherman, but in Jessore community fisherman respondents was higher than other two. It may be due to the reason in Jessore people are doing more fishing activities than Jhenaida and Magura as guided by the Agro-Ecological suitability and more compatible community dynamics. Azad (2013) also reported such results and recommended accordingly for fisheries development.

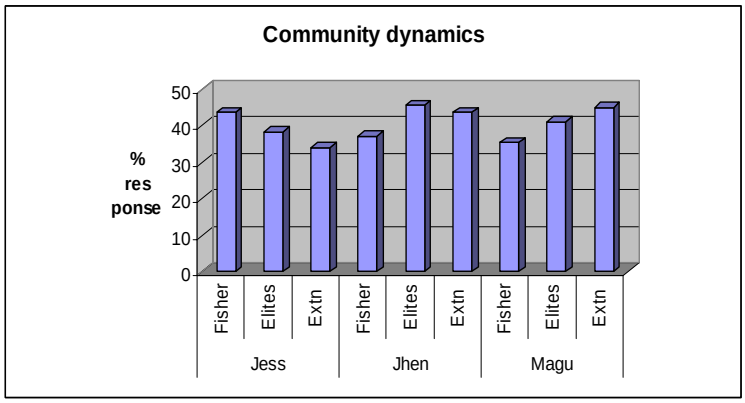

Fig 2. Community dynamics as per Districts

Table 6. Community Dynamics: Mean of participation nature

	Beneficiaries	Member	Representative	Well-wisher
Response participation %	44	33	39	46
	24	20	21	29

The result shows (Table 6) that the percentage of response nature 29% in case of well wisher was high followed by 24% beneficiaries. It seems that so many respondents are interested to advised the fisher for fishing but well wisher are not interested to fishing by themselves.

CONCLUSION

The fishermen as a member of the community should be defined as with Ministry of Agriculture (MOA) along with preferred Bank facilities giving priority of mid aged average literate persons. In the community fisherman should have fishing livelihood the wards of fishers must be accept the profession for the parent community livelihood participating in the manner of sustainable dynamics. Active participation in the fisherman communities should be created for the fishers. Identification of real fisherman rather than elites and well wishers would be the prime feature to improve the situation. At least 70% income should be reinvested in the fisheries sector by the fishers. Intensive skill training in the forms of Information Based communication Technology (IBCT) using multimedia should be given to the fishers on both technologies and community operations. The current database of Agro-Ecological Zones of Bangladesh may satisfactorily use for fisheries research and development if used as well explained digital Competency Based Training (CBT) material.

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