



**UNIVERSITI PUTRA MALAYSIA**

**COMMUNITY BASED INSTITUTIONS AND SUSTAINABLE  
LIVELIHOODS OF INLAND FISHERMEN OF BANGLADESH**

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**COMMUNITY BASED INSTITUTIONS AND SUSTAINABLE  
LIVELIHOODS OF INLAND FISHERMEN OF BANGLADESH**

**By**

**GAZI MD NURUL ISLAM**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in  
Fulfilment of the Requirement for the Degree of Doctor of Philosophy**

**September 2006**



## **DEDICATION**

**To my parents, wife, daughter and late grandfather**



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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**GAZI MD NURUL ISLAM**

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**Faculty : Economics and Management**

This study investigated the impact of Community Based Fisheries Management (CBFM) on household's welfare by examining how the various types of assets contribute to household income. A survey of 240 households in Bangladesh was conducted from February to May 2005 to obtain information from fishermen at CBFM and non CBFM sites (control sites).

The major objective of CBFM is to build local fishery community organizations for managing fisheries sustainably and improve livelihood conditions of poor fishermen. This is carried out by providing credit, training and developing social awareness so that fishermen's capacities for managing their livelihood assets are enhanced. A livelihood assets framework is utilized and a regression model is used to analyze the factors that contribute to household income of poor fishermen under the CBFM and in non CBFM control sites.



The study finds that the fishermen under CBFM areas have improved their access to different assets such as social capital, human capital, physical capital, financial capital and natural capital. The Principal Component Analysis is used to develop an index of the key variables to be considered in measuring the different asset variables.

The results show that the levels of the assets are higher in the CBFM sites compared to the control sites. The participants have acquired use rights of water bodies through administrative support from the government. The organized fishermen participation in making decisions has increased. The participants received higher amount of credit (financial assets) including interest free loans from NGOs to pay for their lease fees and to meet other fisheries related costs. Both the fishermen in the project and control areas have poor productive assets. The fishermen sell their assets during the period of crisis since they do not have savings to fall back to during this period.

To examine the relationship between household's assets and income, the OLS regression is used. The explanatory variables include household characteristics such as age of household head, employment days and household size in addition to livelihood asset variables.

The results of the regression show that the social capital, employment days and area of fishing are significant contributors to household income in the project areas. On the other hand, the variables such as household size, age of household head and education are significant factors in determining household income in the control areas. The contribution of social capital factors is significant to household income which indicates that these social factors play a very important role in poverty alleviation in Bangladesh.



The overall findings of the study provides support for the development of community based fisheries and the investment in enhancing the multidimensional asset base of rural communities to achieve development goals of poverty alleviation and human development.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**INSTITUSI BERASASKAN KOMUNITI DAN KEHIDUPAN MAPAN  
NELAYAN PENDALAMAN DI BANGLADESH**

Oleh

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Kajian ini meneliti kesan Peungurusan Perikanan Berasaskan Komuniti (CBFM) ke atas kebajikan isi rumah dengan melihat bagaimana kepelbagaian jenis aset dapat menyumbang kepada pendapatan isi rumah. Bagi memperolehi maklumat tentang kegiatan nelayan di kawasan CBFM dan kawasan bukan CBFM (kawasan kawalan), satu tinjauan telah dijalankan di Bangladesh yang melibatkan 240 isi rumah sebagai responden.

Objektif utama Peungurusan Perikanan Berasaskan Komuniti (CBFM) adalah untuk membangunkan sebuah organisasi masyarakat nelayan yang menguruskan perikanan secara mampan dan meningkatkan keadaan hidup nelayan miskin. Ini dilaksanakan dengan membekalkan kemudahan kredit, latihan serta meningkatkan tahap kesedaran sosial supaya keupayaan menguruskan harta pencarian para nelayan dapat dipertingkatkan. Satu rangkakerja aset mata pencarian di gunapakai serta model regresi digunakan untuk menganalisis fakto-faktor yang menyumbang kepada sumber



pendapatan isi rumah bagi para nelayan miskin di kawasan CBFM dan juga kawasan bukan CBFM.

Kajian ini mendapati bahawa, para nelayan di kawasan CBFM telah memperbaiki capaian mereka terhadap aset-aset yang berbeza seperti modal sosial, modal manusia, modal fizikal, modal kewangan dan modal semulajadi. Analisis Prinsip Komponen digunakan untuk membangunkan indeks bagi angkubah utama yang akan dipertimbangkan dalam mengukur angkubah aset yang berbeza.

Hasil kajian ini menunjukkan tingkat kepelbagaian aset adalah lebih tinggi di kawasan CBFM berbanding kawasan kawalan. Para peserta telah memperoleh hak guna kawasan air melalui sokongan pentadbiran kerajaan. Penglibatan nelayan yang tersusun di dalam membuat keputusan telah meningkat. Para peserta memperolehi jumlah kredit yang tinggi (aset kewangan) termasuk pinjaman tanpa faedah daripada badan bukan kerajaan untuk membayar yuran pajakan dan juga kos perikanan yang lain. Semua nelayan di kawasan CBFM dan di kawasan kawalan memiliki aset produktif yang rendah. Para nelayan menjual aset mereka semasa keadaan krisis oleh kerana mereka tidak mempunyai simpanan. untuk mengatasi jangkamasa krisis ini.

Bagi mengkaji hubungan di antara aset dan pendapatan isi rumah regresi OLS di gunakan. Pembolehubah luaran adalah terdiri daripada ciri-ciri isi rumah seperti umur ketua isi rumah, jumlah hari bekerja dan saiz isi rumah disamping angkubah aset mata pencarian. Keputusan regresi menunjukkan modal sosial, jumlah hari bekerja dan kawasan penangkapan ikan adalah penyumbang utama kepada punca pendapatan isi rumah di kawasan projek. Selain itu, pembolehubah seperti saiz isi rumah, umur ketua



isi rumah dan pendidikan adalah signifikan dalam menentukan pendapatan isi rumah bagi kawasan kawalan. Sumbangan modal sosial adalah faktor penting terhadap pendapatan isi rumah di mana faktor ini menunjukkan bahawa faktor sosial memainkan peranan penting dalam mengurangkan kemiskinan di Bangladesh.

Penemuan keseluruhan kajian memberi sokongan kepada perikanan berasaskan komuniti di dalam memperkayakan aset multinasional komuniti masyarakat luar bandar dalam mencapai matlamat pembangunan bagi mengurangkan kemiskinan dan pembangunan manusia.

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I certify that an Examination Committee has met on 28 September 2006 to conduct the final examination of Gazi Md. Nurul Islam of his Doctor of Philosophy thesis entitled “Community Based Institutions and Sustainable Livelihoods of Inland Fishermen of Bangladesh” in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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## **DECLARATION FORM**

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.

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**GAZI MD. NURUL ISLAM**

Date :



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## LIST OF ABBREVIATIONS/GLOSSARY

<i>baor</i>	An oxbow lake
BBS	Bangladesh Bureau of Statistics
<i>beel</i>	Deepest part of a floodplain, often with a permanent area of water/wetland
BMC	Beel Management Committee
BRAC	Bangladesh Rural Advancement Committee
Caritas	An International NGO
CBFM	Community Based Fisheries Management
CBN	Costs of Basic Needs (a method of measuring quality of life)
CPR	Common Property Resources
<i>current jal</i>	Nylon monofilament gill net with small mesh
DANIDA	Danish International Development Agency
DFID	Department for International Development
DOF	Directorate of Fisheries
EBSATA	East Bengal Acquisition and Tenancy Act
FAP	Flood Action Plan (a series of flood mitigation and water management planning studies undertaken in 1990-1995)
FRSS	Fisheries Resources Survey Systems
GAP	Gross Agricultural Product
GDP	Gross Domestic Product
GOB	Government of Bangladesh
<i>izaradars</i>	Middlemen/leaseholders
IFAD	International Fund for Agricultural Development
<i>haor</i>	Deeply flooded saucer shaped depression



<i>jalmohal</i>	Fishery leased out by government for revenue
<i>katha</i>	Brushpile constructed to attract fish (a fish aggregating device)
<i>khas land</i>	Land owned by the government
<i>kua</i>	A ditch in a floodplain area to concentrate fish as a water level falls
MOFL	Ministry of Fisheries and Livestock
ISPAN	Irrigation Support Project for Asia and the Near East
ITDG	Intermediate Technology Development Group
MPO	Master Plan Organization under the Water sector in Bangladesh
MOL	Ministry of Land
<i>mohajan</i>	Moneylender
NGO	Nongovernmental Organisation
OLPII	Oxbow Lakes Small scale Fishermen Project, Second Phase
ODA	Overseas Development Administration of the U.K government
NFMP	New Fisheries Management Project
<i>parishad</i>	Council
PMS	Poverty monitoring survey
PRA	Participatory Rural Appraisal
PRSP	Poverty Reduction Strategy Paper
RMC	River Management Committee
SADP	Second Aquaculture Development Project
Tk	Taka, the Bangladeshi currency (in July 1995, Tk 65=US\$1)
TURF	Territorial use rights in fisheries
UPAZILA	Lowest administrative unit of Bangladesh
USAID	United States Agency for International Development



UFO	Upazila Fisheries Officer
WARPO	Water Resources Planning Organization
UNDP	United Nations Development Programme
<i>Zaminder</i>	Family managing an state and collecting revenue during British period



# CHAPTER 1

## INTRODUCTION

Bangladesh has one of the richest fishery resources in South Asia. Fish and fisheries play a major role in employment, nutrition, foreign exchange earnings and other aspects of the economy. Fish alone supplies 60% of animal protein consumed. It provides full time employment to an estimated two million fishermen, small fish traders, fish transporters, packers and other related activities (World Bank, 1989), and another 14 million people are indirectly and partially dependent on fishing. The sector contributes about 5.5% of GDP, 18% of Gross Agricultural Product and 6.28% of export earnings (BBS, 2000).

### 1.1 Background of Fisheries Resources

Inland fisheries production comes from two sources: capture and culture. The total area of inland open water bodies in Bangladesh is 4.92 million ha. (93% total inland water bodies). They provide habitats for 260 species of fish, more than 20 species of shrimps, and numerous other species of plants and animals (Ali, 1991; Nishat et al., 1993).

During the last three decades, there has been a gradual decline in the production of fish from inland capture fisheries (Khan, 1993; Rahman, 1993; Ahmed, 1995). The contribution of inland open waters was 63% in 1983-1984 but it declined to 36% in 2002-2003 (DOF Bulletin, 2004). Aquaculture's contribution however has grown from 16% in 1984 to over 43% in 2003 (from 14,000 ha). Out of total fish production from





inland waters, 55% production came from closed waterbodies and rest 45% came from open waterbodies (Table 1.1). Average per capita fish consumption fell from 43.8 grams in 1995-96 to 38.45 grams in 2000 (BBS, 2001 p.17).

**Table 1.1: Water areas for Bangladesh fisheries, 2003-2004**

Type of waterbody	Water areas (ha)	Water areas (%)	Fish production (mt)	Fish production (%)
<b>A. Inland open waters</b>				
Rivers and estuaries	1,031,563	19.53	152,579	9.27
Floodlands	2,832,792	53.63	497,922	30.23
Beels	114,161	2.16	74,328	4.51
Kaptai lake	68,800	1.30	7,238	0.44
Polder/enclosure	873,000	16.53	-	-
<b>Total Inland Openwater</b>	<b>4,920,316</b>	<b>93.15</b>	<b>732,067</b>	<b>44.45</b>
<b>B. Inland Closed waters</b>				
Ponds	215,000	4.07	795,810	48.32
Baors (oxbow lakes)	5,488	0.11	4,282	0.26
Coastal shrimp farms	141,353	2.68	114,660	6.96
<b>Total inland closed waters.</b>	<b>361,841</b>	<b>6.85</b>	<b>914,752</b>	<b>55.55</b>
<b>Total inland waters (A+ B)</b>	<b>5,282,157</b>	<b>100.00</b>	<b>1,646,819</b>	<b>78.34</b>

Source: Department of Fisheries (DOF, 2003).

Agriculture dominates the rural economy of Bangladesh and a vast inland fishery provides significant livelihood opportunities. Approximately half of its population lives below the poverty line. They live in extreme poverty – often without land or a homestead, without a source of regular income and in households that are headed by a female or have disabled or ill members (World Bank 2002). This amounts to 63 million people who are unable to meet their basic subsistence needs.