



Thesis
3674

**SOCIO-ECONOMIC ASPECTS OF FRESHWATER PRAWN
CULTURE DEVELOPMENT IN BANGLADESH**



**Thesis submitted for the degree of
Doctor of Philosophy (Ph.D.)**

By

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To my father

To whom this have been the happiest event in his life as all that he ever dream of his children to be highly educated

To my mother

Without whose sacrifice and struggle, I would never have reached where I am today

To my grandfather

He was very special to me and passed away while I was writing-up my thesis

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He always encouraged me for higher studies

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In the name of Allah, the most compassionate and the merciful

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Declaration

I hereby declare that this thesis has been composed entirely by myself and has not been previously submitted for any other degree or qualification.

The work of which it is a record has been performed by myself, and all sources of information have been specifically acknowledged.

Nesar Ahmed

Abstract

This thesis is concerned with social and economic aspects of freshwater prawn (*Macrobrachium rosenbergii*) culture development in converted paddy field *gher* systems in SW Bangladesh, based on economic features of prawn production and social impacts within and around prawn farming communities.

Based on a sample of 400 farmers from the four different zones in Bagerhat district in SW Bangladesh, 345 (86.25%) cultured prawn with fish and rice in their *gher*. The culture period is typically nine months, wild fry are stocked when available in May-June and harvested from November to January. A variety of feeds are used but the preferred material is the freshwater snail, *Pila globosa*. Productivity is variable, averaging 432 kg ha⁻¹. The freshwater prawn is a highly valued product for international markets and is therefore almost all exported.

All farmers in all zones and different *gher* size categories made a profit, with seed and feed dominating variable costs. Considerable variation in production costs and profitability was observed. The culture of prawn in *gher* systems is technically possible in a variety of conditions though expanding small scale of farming mainly depends on reducing production costs. Future targets could be to integrate with other agricultural activities especially dike cropping and rice production in the monsoon.

The livelihoods of a large number of people are associated with prawn farming. Four different fry, snail and prawn markets were surveyed, including a sample of 60 fry catchers, 40 fry traders, 75 snail collectors, 40 snail traders and 40 prawn traders. A sample of 200 women, associated with *gher* farms was also surveyed.

In spite of socio-economic constraints, most of the households of farmers (81%) have improved their status through prawn farming where prawn have brought out clearly positive changes of economic activities and generated new employment. All appeared to have gained from their activities, women have enhanced their position in families and societies.

However, concerns arise about the long-term sustainability of prawn farming due to high production costs, low supply of wild fry and snail meat, poor natural resources, poor institutional support and inadequate extension services, all of which have affected sustainable livelihoods of farmers and associated groups. It may necessary to establish local ingredients feed industries, prawn hatcheries and to provide low-interest credit with institutional and policy support for sustainable *gher* farming.

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List of Abbreviations

ASA	Association for Social Advancement
BAFRU	Bangladesh Aquaculture and Fisheries Resource Unit
BBS	Bangladesh Bureau of Statistics
BOBP	Bay of Bengal Programme
BRAC	Bangladesh Rural Advancement Committee
CIHI	Centre for International Health Information
DFID	Department for International Development
DIFTA	Danish Institute for Fisheries Technology and Aquaculture
DOF	Department of Fisheries
FAO	Food and Agriculture Organisation
FFWC	Flood Forecasting and Warning Centre
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GNP	Gross National Product
GOLDA	Greater Option for Local Development through Aquaculture
GSS	<i>Gono Sahajya Sangstha</i>
HSC	Higher Secondary Certificate
MBBS	Bachelor of Medicine and Bachelor of Surgery
NGO	Non Government Organisation
PRA	Participatory Rapid Appraisal
PRISM	Projects in Agriculture Rural Industry Science and Medicine
REB	Rural Electrification Board
RRA	Rapid Rural Appraisal
SAARC	South Asian Association of Regional Co-operation
SESRTCIC	Statistical, Economic and Social Research and Training Centre for Islamic Countries
SSC	Secondary School Certificate
UNDP	United Nations Development Programme

Glossary of Terms

<i>Aman</i>	Rice planted during the monsoon beginning in June and harvested in November-December.
<i>Aus</i>	Rice planted during March-April and harvested during July-August.
<i>Baor</i>	Closed water body equivalent to an oxbow lake, up to several hundred hectares.
<i>Baperi</i>	A kind of broker who is related in fry trading. Their job is to buy prawn post-larvae from fishermen in coastal markets and carry them to fry traders in prawn farming areas.
<i>Beel</i>	Seasonal open water bodies often containing low-lying agricultural land.
<i>Behundi</i>	A net use of prawn post-larvae catching.
<i>Bigha</i>	A unit of land equivalent to 0.21 ha.
<i>Boro</i>	Rice grown in the dry season from January to April.
<i>Dadon</i>	A system of tied credit through which the prawn traders advance money to the prawn farmers in exchanging for the assured sale of prawns.
<i>Depot malik</i>	A small-scale prawn trader.
<i>Foria</i>	Local agent in fry and prawn trading, their job is to carry fry from traders to the farmers and also carry market size prawn from farmers to the prawn traders.
<i>Gher</i>	An enclosure made for prawn cultivation by modifying rice fields through building higher dikes around the field and excavating a canal several feet deep inside the periphery of the dikes to retain water during the dry season.
<i>Goga jal</i>	A barrier net use of prawn harvesting.
<i>Gol pata</i>	A kind of palm, widely used in prawn farming communities for house making.
<i>Haor</i>	Low lying areas that are seasonally flooded, normally for 5 to 6 months per year.

<i>Katcha</i>	Rough and rural.
<i>Khepla jal</i>	A cast net use of prawn harvesting.
<i>Maund</i>	A unit of weight measure equivalent to approximately 37.4 kg.
<i>Pucca</i>	Proper and good quality.
<i>Thana</i>	An administrative unit in Bangladesh equivalent to a sub-district.
TK	Bangladesh unit of currency; US\$ 1= Tk 50 (January 2000), Tk 45 (January 1998).

CHAPTER 1

GENERAL INTRODUCTION

1.1 Background

In Bangladesh, freshwater prawn farming is currently one of the most important sectors of the national economy, and during the last two decades its development has attracted considerable attention for its export potential. This thesis is concerned with social and economic aspects of its development in Bangladesh, one of the world's least developed countries, in which patterns of rural development, and of market structures, may be expected to change markedly over coming years. Before developing the main themes of the work, it is useful to provide some background of Bangladesh, its resources and its population.

The People's Republic of Bangladesh emerged on the world map as an independent state on December 16, 1971. The territory of the present Bangladesh was historically under Muslim rule from 1201 to 1757 A. D. Subsequently, it was part of British India, when the British ruled over the entire Indian sub-continent, including this territory, for nearly 190 years from 1757 to 1947. With the termination of British rule in August 1947 the sub-continent was partitioned into India and Pakistan. Bangladesh was then a part of Pakistan, known as East Pakistan, and remained under the internal colonial regime of Pakistan for 24 years from 1947 to 1971. It became an independent and sovereign state on December 1971 following its victory of the war of liberation against Pakistan from March 25 to December 16, 1971.

Bangladesh is located in Southern Asia, bordering the Bay of Bengal, between Myanmar and India. The state covers an area of about 144,000 km² (Coutsoukis, 1999). The vast majority of Bangladesh's inhabitants are Bengalis, who are largely descended from Indo-Aryans, who began to migrate into the country from the west thousands of years ago and who mixed within Bengal with indigenous groups of various racial stocks. Ethnic minorities include the 'Chakma' and 'Mogh', Mongoloid peoples who live in the hilly area in the Southeast, and include the 'Santal', mainly descended from migrants from present-day India; and the 'Biharis', non-Bengali Muslims who migrated from India after the partition (National Data Bank, 1998).

Bangladesh had a population of about 127 million in July 1999, making it the world's eight most populous country (Coutsoukis, 1999). The average density of about 763 persons per square kilometre, is much higher than that of any other country in the world (National Data Bank, 1998). About 85% of the Bangladeshi people live in villages or semi-urban areas (Chakraborty, 1998). From the total population, 88.3% are Muslims, 10.5% are Hindus, 0.6% are Buddhists, 0.4% are Christians and the rest (0.2%) belong to the other faiths (Chakraborty, 1998; Coutsoukis, 1999). The literacy rate was recorded at 38.1% in 1995, 49.4% for males and 26.1% for females. The population growth rate was estimated at 1.59% annually in 1999, falling from a previous high of 2.32% in 1995 (Coutsoukis, 1999). Nearly 36% of the population remains below the poverty line for the very poor (i.e. could not able to eat food three times a day) and 53% below the poverty line for the poor (i.e. could able to eat food, but lack of other basic needs) (World Bank, 1998). Moreover, child malnutrition and maternal mortality remain among

the highest in the world (World Bank, 1998). Bangladesh spends only 2% of its Gross National Product (GNP) on education, compared to 3.2% for average low-income countries (Khandker, 1996). Low investment in education results in low literacy, which in turn results in low productivity, low incomes, poor health and high population growth.

Bangladesh is often called the 'land of rivers' (Bundell and Maybin, 1996), and rivers are a prominent and important feature of its landscape. The landmass comprises mainly the delta of the three major rivers, the Ganges, the Brahmaputra and the Megna, presenting a typical disposition of vast green fields bounded by low hills. Its flat alluvial plains comprise some of world's most fertile agricultural lands (Chakraborty, 1998).

The mineral endowment of Bangladesh is meagre. The principal energy resource, natural gas, is found in several small fields in the northeast. There is a coal field in the northwest and large peat beds underlie most of the delta. Limestone and pottery clays are found in the northeast (National Data Bank, 1998).

The people of Bangladesh have been subjected to a number of military coups. Bangladesh followed a socialist economic philosophy from 1971 to 1975, followed by a limited and gradually extended scope for private ownership established by the subsequent military regimes until 1991. Parliamentary democracy has been taking shape for the last few years. After a period of 15 years of military rule from 1975 to 1990, two governments were elected democratically, in 1991 and in 1996. The economic policies adopted by the democratically elected governments aimed to provide full co-operation to

private investors to ensure their maximum participation in the economy.

Throughout the internal colonial regime of Pakistan, the economic and social development of the country were neglected. The economic conditions of the country, just after the war of liberation, can be understood from the following lines of Sobhan (1982).

“The systematic drainage of Bangladesh’s resources through the mechanism of internal colonial exploitation left the economy at the outset of liberation with a large external resource gap. This manifested itself through a deficit in the availability of good grains, low levels of internal savings and a high proportion of its population living below the poverty line. The parameters of poverty and dependence bring out a scenario of secular increase in external dependence during the decade of 1960.”

Bangladesh has been hampered by a relative lack of natural resources and a limited infrastructure. It is highly vulnerable to natural disasters such as flood, tornado, cyclone and drought. Its economy has been heavily dependent on foreign aid, because of which it remains highly vulnerable to pressure from aid donors in influencing its external alignments and the course of its domestic policy. Indeed, there is no area in the development field where donors do not choose to exercise a say (Hoque, 1991). Sobhan (1982) observed that *“the donors have attempted to influence policies on state ownership, the role of private sector, the monetary and fiscal policies, pricing policy, distribution policy, the use of administrative controls, the structure of development, the*

pattern of development administration and a variety of the operational policy oriented and ideological issues”.

Presently a good number of international missions have been working in Bangladesh to fight poverty and improve the quality of livelihood through sustainable growth and investment in people. Since Bangladesh joined the World Bank in 1972, the International Development Association (IDA), the World Bank’s concessional lending arm, has financed more than 177 operations in Bangladesh, with interest-free long-term loans totalling more than US\$ 8 billion (World Bank, 1998). Presently the bank’s active lending portfolio for Bangladesh includes more than 20 projects such as emergency flood recovery credit, female secondary schools assistance project, mitigation of arsenic contamination of ground water etc. Despite sustained domestic and international efforts to improve economic and demographic prospects, Bangladesh remains one of the world’s a poorest, most densely populated, and least developed nations.

In spite of these constraints, Bangladesh has made progress on human development. Key social indicators: fertility, life expectancy, school enrolment for girls, and child immunisation have improved significantly since independence in 1971. The country can now grow enough food in normal years to meet its own demand. Bangladesh’s Non Government Organisations (NGOs) are among the most vibrant in the world, providing microcredit and social mobilisation to some 8 million poor, mostly women (World Bank, 1998). It has pioneered innovative models of development led by NGOs that are being replicated world wide.

1.2 The national economy

The country's macro economy has been stable and social indicators are improving, but long-term economic growth has been sluggish and only recently has poverty started to decline. Bangladesh followed prudent macroeconomic policies and adopted some measures to open up the exchange and trade systems, improve the fiscal structure, and deregulate the financial sector during the early 1990s (World Bank, 1998). These measures have contributed to low inflation, developing a viable external position, provided some financial deepening, and increased international trade. Economic growth has been faster recently (World Bank, 1998), but though the government wants an outward-oriented private sector to drive economic growth, the business environment is unpredictable (Quddus and Rashid, 1998).

The value of Gross Domestic Product (GDP) and Gross National Product (GNP) can be used to indicate economic progress. The GDP is defined as value of all the final goods and services produced in the economy in a year (Hall and Taylor, 1993), while GNP, the sum of the money values of consumption, gross investment, government purchases of goods and services, and net exports (Samuleson and Nordhaus, 1992), is the most comprehensive measure of a nation's total output of goods and services (Parkin and King, 1995). Until very recently there has been little notable difference between GDP and GNP in Bangladesh (Table 1.1).

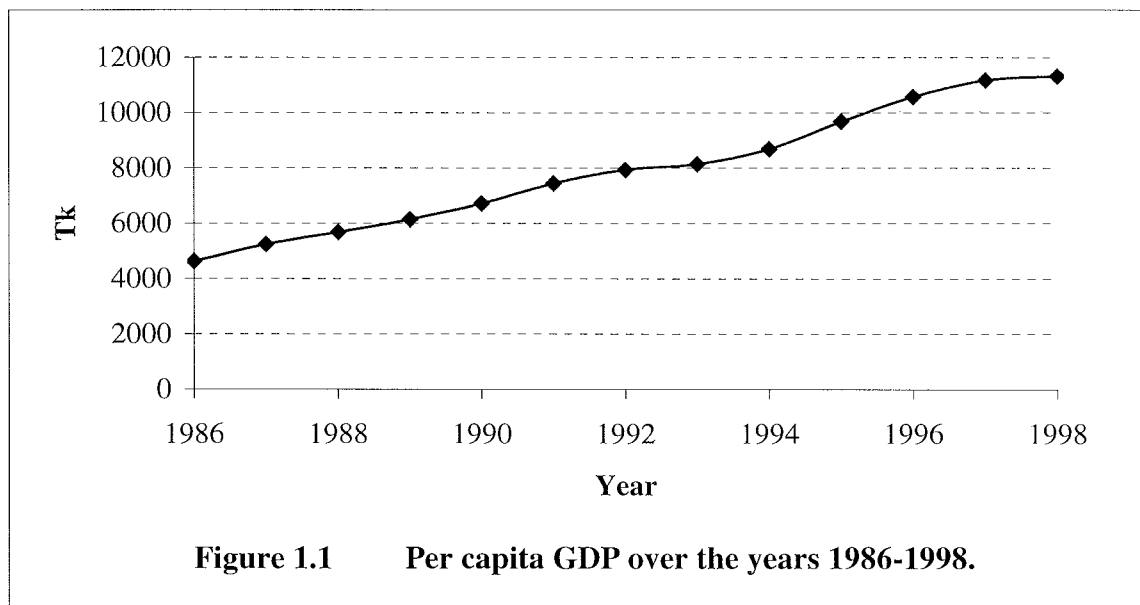
Table 1.1 Major economic groups in GDP over the years 1994-1998.

National accounts	1994-95	1995-96	1996-97	1997-98
GDP at current market prices (million US\$)	29,053.1	31,144.5	31,956.7	32,848.6
GNP at current market prices (million US\$)	30,435.2	32,582.7	33,585.6	34,455.6
Agriculture in GDP (%)	31	30	30
Industry in GDP (%)	18	18	17
Services in GDP (%)	52	52	53
Total consumption: public and private (million US\$)	26,801.4	28,805.7	29,566.0	30,253.5
Total investment: public and private (million US\$)	4,812.3	5,369.0	4,880.6	4,761.9

Source: SESRTCIC, 1999 (year ending 30 June).

As shown in Table 1.1, the largest sector in the Bangladesh economy is agriculture (SESRTCIC, 1999; Iqbal, 2000), in 1997, accounting for about 30% of the GDP, 68.5% of employment and one fifth of exports (BBS, 1998). As large agricultural holdings are uncommon, the scope for the use of modern intensive methods of farming may be limited, though through co-operative farming, the use of modern machinery has been successfully introduced and is gaining popularity. Rice and jute are the principal crops, while sugarcane, potato, oilseeds, pulses, tea and tobacco are also important. The introduction of high yielding rice has revolutionised rice production in terms of areal yield. Rice being the staple food in Bangladesh, its production is of crucial importance (Chakraborty, 1998). Wheat production has also increased substantially while cotton is making a steady headway.

The country's per capita GDP has steadily risen in recent years, as shown in Figure 1.1, from Tk¹ 4,626 in 1986, increasing to Tk 6,717 in 1990, Tk 8,685 in 1994, and Tk 11,316 (US\$ 276) in 1998. Though a positive sign of the country's economic improvement, the rate of increase is very low comparing to other SAARC² countries except Nepal. In 1998, per capita GDP in SAARC countries were: Bhutan US\$ 430, India US\$ 430, Maldives US\$ 1,180, Nepal US\$ 210, Pakistan US\$ 480 and Sri Lanka US\$ 810 (World Bank, 1998).



Source: BBS, 1998 (year ending 30 June).

¹ Bangladesh unit of currency; US\$ 1= Tk 50 (January 2000), Tk 45 (January 1998).

² SAARC: The South Asian Association of Regional Co-operation (SAARC) was established in 1985, comprising the seven countries of South Asia, those are Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka.

