

WF
PB
#3 #525



WorldFish C E N T E R

P O L I C Y B R I E F

Aquaculture could be used to create hundreds of thousands of jobs in Bangladesh over the next decade - helping to reduce the widespread poverty that is stifling the country's economic growth.

The country already has the necessary water bodies and labor. Expertise is also available, because market-driven aquaculture has boomed in Bangladesh over the last three decades. Now is the time for decision makers to step in and capitalize on these advantages - to create more jobs, drive up economic growth, and fight poverty.

What exactly can planners and policy makers do to gear up aquaculture-related enterprises? Researchers in Bangladesh have worked with the WorldFish Center to identify four areas where strategic policy action could help to accelerate the growth of aquaculture (*Box 1*).

Box 1. Policy actions needed:

- ① Expand aquaculture - by leasing government-owned and managed water bodies.
- ② Integrate aquaculture into rural development plans - by providing credit and leasing options to encourage the rural poor to farm fish.
- ③ Raise yields, quality and returns - by improving extension services, input quality, and downstream storage and processing.
- ④ Protect the natural resource base - to ensure fish-farming benefits are sustainable.



AQUACULTURE BUSINESSES

A LOW COST OPTION FOR ECONOMIC GROWTH IN BANGLADESH



WHY

IS THE TIME RIGHT FOR PROMOTING AQUACULTURE BUSINESSES?

Past successes in Bangladesh's fishery sector – which is now one of the fastest growing in the economy – show that aquaculture is well worth investing in (Box 2). On the demand side, the outlook is bright: domestic demand is growing for high-value foods such as fish, while trade liberalization has opened up lucrative international markets. For example, the brackish water shrimp *galaxias* was the country's second largest export earner, generating US\$360 million in 2008-2009.

Countless enterprising individuals have already seized the opportunities offered by aquaculture, and set up small and medium-sized fish farms in coastal and inland areas. This has created important knock-on benefits to the economy, in the form of businesses which sprang up to satisfy the demand for fish seed and feed, and processing, marketing and distribution services.

In addition, there is great potential to expand the aquaculture sector. Rural Bangladesh has extensive natural and man-made water bodies, so areas suitable for fish farming – the major type of capital needed – are readily available. What is more, nearly three-quarters of rural households already raise fish to feed their families, and sell any surplus. The rural poor thus provide a huge pool of labor familiar with fish farming.

However, aquaculture in Bangladesh lags behind other fish-producing nations – in yields per area, product quality, food hygiene standards and marketing chains. Investment is urgently needed if the Bangladesh fish sector is to compete successfully on the global fish market.

Box 2: Bangladesh's thriving fishery sector (2003-2014)

- 5% of gross domestic product
- 28% of the value added in agricultural production
- US\$390 million in export revenues
- ⊙ 1.3 million people directly employed in fish farming; around 0.6 million employed in related industries



harvesting fish from a polyculture pond

POLICY ACTION NEEDED

ACCELERATING THE GROWTH OF AQUACULTURE WILL **ENCOURAGE PRIVATE-SECTOR INVESTMENT, CREATE RURAL EMPLOYMENT AND HAVE MULTIPLIER EFFECTS** WHICH, IN TURN, WILL INVIGORATE THE ECONOMY. TO STIMULATE AQUACULTURE BUSINESSES, BANGLADESH NEEDS TO TAKE ACTION IN FOUR STRATEGIC AREAS >>>

Bangladesh could expand its area under aquaculture by 1 to 4 million hectares. To give an idea of what this could mean, bringing just an extra 1 million hectares into production will:

- Raise gross returns by US\$2 billion;
- Contribute an additional 7% to gross domestic product;
- Generate 1.5 million full-time-equivalent jobs, mostly for the rural poor; and
- Create spin-off upstream and downstream enterprises and jobs.

Although two-thirds of privately owned ponds and ditches are already used for aquaculture – and the remaining third lie derelict because of ownership disputes – the government owns and controls vast bodies of water, such as reservoirs, irrigation canals, flood plains and rivers (Table 1). These could be leased out to cooperatives, individuals or private companies (Box 3) to fast-track the fish sector's expansion.

Table 1. Area of water bodies, area cultured, and areas that could be used to expand aquaculture in Bangladesh

Water body	Area (ha)	Area cultured (ha)	Potential (ha)
Floodplains, paddies	2 832 792	?	700 000
Rivers, canals	1 031 563	?	100 000
Ponds and ditches	305 025	198 179	106 846
Boors (oxbow lakes)	5 488	5 488	
Shrimp ghêrs (estates)	203 071	100 000	
Total (minimum)	4 174 868	406 738	1 006 846

Source: Dynamic Agribusiness-focused Aquaculture for Poverty Reduction and Economic Growth in Bangladesh by M. Karim, M. Ahmed, R.X. Taha, Ader, M.A. Taslim and H.A. Rahman, 2005, WorldFish Discussion Series No. 1, 44 p.

Such leasing options would maximize returns on investment and make sure that the financial benefits of aquaculture are fairly distributed. The key issues here would be to balance private-sector efficiency with public-sector regulation, while providing all investors with secure ownership or leasehold rights over land and water.

Box 3. Leasing options to encourage fish-farming businesses

Leasing to village cooperatives

Leasing government-owned or controlled water bodies to cooperatives or village organizations could create incomes for many poor rural people. But extension efforts and micro-credit schemes would be needed because villagers may not have the necessary finances or technical and managerial skills.

Leasing to entrepreneurs

Entrepreneurs would probably run their aquaculture enterprises more efficiently than cooperatives, hire more workers and pay higher wages. So, this option might prove a more effective use of resources. Entrepreneurs are also more likely to introduce new technology, bring in management expertise and find the best markets.

Entrepreneurs would probably run their aquaculture enterprises more efficiently than cooperatives, hire more workers and pay higher wages. So, this option might prove a more effective use of resources. Entrepreneurs are also more likely to introduce new technology, bring in management expertise and find the best markets.

Without help, the very poor won't be able to profit from the opportunities offered by aquaculture – as even modest aquaculture ventures require some capital. Integrating aquaculture into rural development plans geared towards supporting small agribusinesses offers one way forward. This will allow poor people with little education and few physical assets to access help such as credit schemes and training.

To guarantee that small and medium-sized businesses thrive, policymakers need to ensure that they get the technologies and the quality inputs they need. They also need to promote links between small producers, producer organizations and market chains. Much of this could be achieved through public-private partnerships (Box 4).

Box 4. Encouraging the growth of aquaculture: what rural development plans need to provide

Needs	Who would be involved?
Access to finance through micro-credit schemes and flexible land leases that will provide collateral for bank loans	Civil-society organizations, banks
Access to quality inputs and services such as good quality brood stock, fish feed, cold stores, and marketing channels	Public-sector R&D, small businesses, trading companies

Government priorities and actions	Private-sector priorities and actions
Develop and disseminate aquaculture technologies and services	Invest in aquaculture, improve production and marketing
Develop and disseminate aquaculture technologies and services	Invest in aquaculture, improve production and marketing

The whole chain of fish production creates jobs, starting with fish hatcheries and feed mills, and continuing through fish farms to transportation, storage, processing, marketing and export. Growth in aquaculture would therefore greatly boost rural development by providing many of the poor with paid employment. This would allow them to accumulate assets and climb out of the cycle of poverty that has trapped many families for generations.

THE WHOLE CHAIN OF FISH PRODUCTION CREATES JOBS



RAISE YIELDS QUALITY AND RETURNS

Bangladesh's aquaculture just isn't efficient – in fact, productivity is only 12% that of high-performing countries. This means that there is enormous scope for increasing yields. More technical know-how and better business skills would improve the quality and quantity of fish produced. This could raise incomes and double the fishery sector's contribution to gross domestic product. Achieving this, however, means teaching aquaculture workers how to manage hatcheries properly and prevent and treat disease. Linking fisheries research in universities and government agencies directly to field trials in rural communities would also help to achieve this.

More is needed, however, than better technologies on fish farms. Public institutions or public-private partnerships also need to invest in quality input systems and downstream services. To improve inputs, these organizations need to increase the available supply of certified brood stock and introduce quality and health certificates for fish seed and shrimp fry. They also need to regulate hatcheries, decentralize fish nurseries (because a lot of fish die during transportation), and ensure that quality fish feed is available.

To improve product quality, food health and safety testing facilities need to be set up to protect consumers at home and allow producers to take advantage of lucrative export markets. This would also require detailed and accurate documentation systems, to trace the fish from their point of origin (the producer) to the processing plant and point of sale. Distribution systems would also have to be improved, to ensure that they could handle higher-value and more perishable foods. To raise returns, the country needs to invest in the development and promotion of new products that appeal to consumers. Successful diversification into high-value species, such as carp, monosex tilapia, koi and magur, would also provide a tremendous boost to aquaculture businesses.

Returns can also be raised at the farm level. Researchers have found that fish culture gives net returns that are four times higher than those provided by rice. In addition, some aquaculture technologies can be combined with traditional systems to produce more and add value. In fact, alternating between rice and fish cultivation, or growing rice and fish together generate higher returns on investment than simply growing two crops of rice per year (Table 2).

Table 2. Returns and labor use of shrimp, fish, and rice cropping and salt production – and combinations of activities – in freshwater and brackish water systems in Bangladesh.

Cropping system	Net return (Taka per hectare per year)	Labor (person days)	Labor cost as % of total cost	Benefit-cost ratio
Freshwater systems				
Double-crop rice	13 324	308	37	1.19
Simultaneous rice-fish	55 877	n/a	36	1.48
Pond fish	56 444	n/a	33	1.58
Alternate rice-fish	61 426	n/a	34	1.59
Carp-based fish polyculture	54 446	247	30	1.89
Brackish water systems (coastal areas)				
Rice farming	16 446	110	27	1.58
Alternate rice-shrimp	62 300	199	22	2.39
Shrimp farming	77 226	255	32	2.62
Alternate shrimp-salt	155 048	213	16	2.68

¹ 1 US\$ = 70 Taka (2006) Sources: various publications listed in 'Dynamic Agribusiness-focused Aquaculture for Poverty Reduction and Economic Growth in Bangladesh.'

PROTECT THE NATURAL RESOURCE BASE

The benefits of aquaculture must not be offset by high environmental costs. Public investment in better land-use plans, and improved water supply and drainage could help to minimize risks like salinization, loss of biodiversity and threats to wild fish populations. Measures such as banning fishing in the breeding season, banning the collection of *galda* brood shrimp from March to November, and establishing fish sanctuaries, would protect wild fish brood stocks. Rural development plans could also be used to ensure that aquaculture makes best use of floodplains and low-lying land while minimizing risks to the environment.

THE WAY FORWARD

Aquaculture businesses are a promising option for stimulating economic growth and creating jobs in rural Bangladesh. To promote their development, policy makers need to improve linkages between public, private and civil society – by crafting action plans for public and private investment that encourage government agencies, businesses, producers and NGOs to work together to develop sustainable aquaculture. New guidelines to steer the collaboration process will also be necessary – to ensure

that the different agencies and stakeholders work together effectively and efficiently. Policy makers also need to make credit available to poor people, and to women in particular.

To stimulate community-based ricefield and floodplain aquaculture – which will create jobs and raise agricultural productivity – the government will need to make more land available for fish farming. However, this will only entail modest costs. What is more, successful models of such community-based and market-focused aquaculture already exist. So, it is simply a question of applying these in similar environments within Bangladesh. Integrating the design of rural road networks, and flood control, irrigation and drainage infrastructure, will further pave the way for aquaculture businesses.

Decision makers also need to reorganize and refocus extension, training, and technology development efforts, and allocate adequate budgets for this. This will support activities at the start of the agri-business chain (e.g. the supply of seed, feed and other inputs) and at its end (e.g. transport and marketing). It will also help the country to meet food safety and quality requirements, and safeguard the environment.

By taking these steps, policy makers would seize an opportunity to boost the fish sector and provide ways out of poverty for huge numbers of the rural poor. In turn, breaking the poverty cycle and freeing millions from poverty will unlock the door to economic growth.

