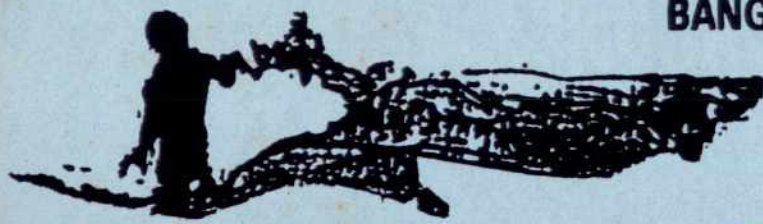


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BANGLADESH FLOOD ACTION PLAN 17

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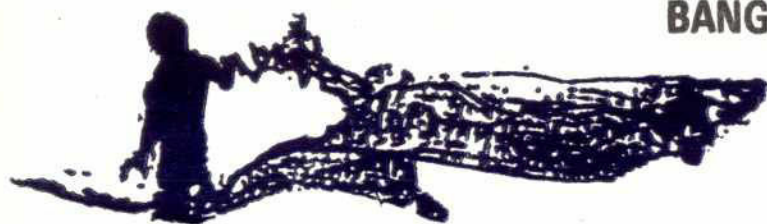
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FAP 2
NORTH WEST
REGIONAL STUDY



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FAP 2
NORTH WEST
REGIONAL STUDY

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ALTERNATIVE APPROACHES TO ASSESSING THE SOCIO-ECONOMIC IMPACTS OF CHANGES IN FISH PRODUCTION DUE TO THE FLOOD ACTION PLAN.

Contents

1. Introduction	page 2.
2. Pricing within the Conventional Cost-Benefit Approach to Project Analysis.	page 3.
3. Inclusion of Cost of Mitigation Measures in Project Cost Benefit Analysis.	page 4.
4. Additional Costs to be Included in Cost-Benefit Analysis: Migration / Resettlement Costs.	page 6.
5. Distributional and Poverty Issues.	page 7.
6. Food Security / Nutrition.	page 8.
7. Conclusions.	page 10.

1 Introduction

1.1 In Bangladesh various FCD/I schemes have promoted rice production by reducing the risks attached to irrigated *boro* cultivation and increasing the area in which *T. aman* is viable. The benefits have gone to farmers, who experienced an increase in the productivity of their land, and, to a lesser degree, to the landless, who obtained more work. But increases in rice production are often bought at the cost of a loss in productivity of the open water capture fisheries, due to the changes in depth, duration and source of flooding. As a result, those who relied on access to these fisheries have suffered a loss livelihood.

1.2 The view has been expressed both within a number of FAP studies and by outside commentators that the net result for some of the poorest households - particularly fishermen and the landless - may actually be negative: the increases they enjoy in income due to increased agricultural productivity or employment fail to compensate for the decline in their fish catch. This is a proposition of particular concern, given the already highly precarious livelihood and nutritional status of these household categories.

1.3 For the regional FAP studies required to perform cost-benefit analysis of the proposed FCDI investments, there are two additional problems: first, that the small miscellaneous fish species consumed by the rural poor - though of considerable nutritional value to them - are accorded little economic significance due to the low market prices they attract; secondly, that the decline in fish catch that is likely to result from the FAP will lead to a continued increase in the relative price of fish.

1.4 An extended debate involving several FAPs has been prompted by this constellation of concerns. Much of this debate has centred on issues of fish pricing and the mitigation measures that might be adopted to offset the losses anticipated. The purpose of this document is to review some of the arguments that have been put forward while placing them in context of the principal underlying issue: the impact of the FAP on the nutritional and livelihood status of the rural poor.

1.5 Currently in the proposed FAP Guidelines for Project Assessment there will be a conventional cost-benefit analysis (economic analysis) and a multi-criteria analysis. The economic analysis is basically concerned with measuring the net aggregate value of goods and services produced, used or lost by a project, in terms of their value to the national economy. The multi-criteria analysis includes a number of other issues including measures of environmental impact and impact on income distribution.

1.6 Since FCD/I projects have complex and diverse impacts which cannot adequately be represented in a single measure, multi-criteria analysis would be used as the primary indicator of a project's suitability. However, in view of the relatively undeveloped nature of the multi-criteria analysis as an appraisal tool, it is important to focus on the extent to which the economic analysis incorporates the impact of projects on capture fisheries. This requires looking at the valuation of fish output in the economic analysis.



2 Pricing within the Conventional Cost-Benefit Approach to Project Analysis.

2.1 The conventional cost-benefit analysis is concerned with relative prices of commodities and pricing for efficient resource allocation; it does not consider distributional impacts, and therefore implicitly assumes that society is indifferent to the distribution of gains and losses resulting from a project. Conventional analysis is therefore inappropriate for addressing the issue of impacts on poor households, but it does provide the starting point from which a more comprehensive analysis can be developed.

2.2 The conventional analysis takes the market price as the starting point. The market can be assumed to be partially competitive, although there are probably elements of control by large traders. There is a question of which market price to take, but basically we are interested in the price in the local market. This will differ for different commercial categories of fish but in principle can be collected. In addition, the seasonal nature of fish supply must be taken into account. As the flood waters recede fish supplies are plentiful and prices are low but at other times of the year, fish become increasingly scarce, and prices rise. It is therefore necessary to derive a market price which reflects these seasonal variations rather than accepting the lower price which prevails after the floods.

2.3 In conventional economic analysis, the market price is adjusted so that the economic (or "shadow") price reflects the "real value" to the economy. The adjustments involve removing the effects of distortions often created by Government policies; this is often done by recasting prices in terms of world market prices, which are generally taken to be more competitive. Prices of goods traded on world markets can be adjusted with reference to world market prices of those goods, but for goods which are not traded internationally, an economic price is derived by calculation of their real production cost with reference to real prices or where this is either not feasible or too time consuming, by using a standard conversion factor (SCF). In Bangladesh, prices of fish are adjusted by a factor of 0.87 (based on the Planning Commission figures). Thus reducing the economic value of fish compared to traded goods.

2.4 The approach as described above (para 2.3) is the one used so far in FAP Regional Studies for preliminary economic analysis of potential projects. However, in rural Bangladesh, there are inherent dangers in narrowly defining the value of fish purely on the basis of current market prices or shadow prices:

(i) Poor households consume species of fish of relatively low market value which nonetheless have high nutritional utility to those consumers. Much of this fish is consumed directly without entering the market and where it does the purchasing power of the rural poor is such as to severely constrain the demand for fish in the market, with the result that market price does not adequately reflect its nutritional utility.

(ii) the availability of fish to the lower income groups at present is contingent upon the relatively open access nature of capture fisheries: in other words, the current utility of fish, with respect to income and nutrition, for different income strata in the society is also related to the system of access to the resource, i.e. common property, leasing systems, private property.

2.5 In addition the FPCO Guidelines suggest that the economic analysis be conducted using constant prices. This is a standard procedure within project analysis, and where the relative prices of goods remain constant, simply removes the complications that arise from inflation. But the real price of fish has increased systematically over the last decade; and many of the underlying reasons for this - improved marketing infrastructure, increasing urban populations and incomes would ensure that this trend will continue even if FAP itself had no impact on fisheries production.

2.6 There is widespread public perception that the floodplain and beel fisheries in Bangladesh are in decline. FCD/I projects, which were designed without consideration of impacts on fisheries, may have well contributed to this decline. The projects have certainly reduced the environmental capacity of the floodplains and disrupted the fish migration routes, leading to production loss and stock depletion through diminished reproduction and growth. The resultant diminished stock is far more susceptible to overfishing. The FAP is likely to continue this trend, even if the recommended mitigation measures (such as floodplain stocking, fish passes and increased support for aquaculture) are introduced. As a result fish supply will be further reduced and a continuing - and perhaps accelerated - increase in real prices can be expected.

2.7 It is therefore recommended that valuation of fish output should adjust the current market price in order to reflect the increasing real value of fish to the society as a whole. The proposed adjustments are:

- (i) The market price itself should be a weighted average of seasonal prices;
- (ii) A real increase in future prices should be assumed to take account of likely increasing scarcity as capture fisheries decline.¹

2.8 In summary, conventional cost benefit project analysis has often failed to reflect the importance of capture fisheries, particularly as a source of nutrition and income for poor households. In addition, use of current market price as an index for the value of fish in FAP project analysis does not take into consideration the likely increase in price due to falls in supply resulting from stock depletion. These considerations are critical to the predictive analysis of the potential gains and losses of the Flood Action Plan. It is important for the FAP projects to avoid the earlier omissions and find ways of fully accounting for such important impacts.

3 Inclusion of Cost of Mitigation Measures in Project Cost Benefit Analysis.

3.1 Mitigation identifies measures to restore fisheries output which would otherwise be reduced as a result of an FCD project. A number of mitigation measures have been proposed to offset the losses from the anticipated reduction in fish catch. These can be analyzed in terms of their practical/economic viability and the extent to which they address fundamental concerns.

¹ In terms of its impact on the discounted cost and benefit stream, equivalent to a 3-4 percent p.a. growth in real prices - the percentage annual increase in real price (value) since 1985 for species potentially impacted by flood control; FAP-17 analysis.

3.2 A decline in catch from open water capture fisheries involves both a reduction in the supply of fish available for consumers and a loss of both livelihood and access to a cheap source of protein for those fishing. Many of the proposed mitigation measures, by addressing only the first of these issues, ignore the principal underlying concern over the FAP impact on the livelihood and nutritional status of the landless and fishermen.

3.3 Three types of mitigation are often mentioned, i.e.

- (i) open water stocking programmes;
- (ii) engineering solutions to fish migration and reproduction; and
- (iii) aquaculture.

3.4 However, mitigation interventions are highly unlikely to fully compensate for losses in capture fisheries because:

- (i) Engineering solutions are as yet unproven in Bangladesh and therefore cannot be guaranteed to fully compensate for declines in capture fisheries;
- (ii) Mitigation interventions, such as stocking and aquaculture that compensate for loss in natural recruitment, assume the technology exists to rear indigenous species. They also require substantial and sustained inputs of material resources for infrastructure development and human resources to provide the enhanced management needs, neither of which are always available.

3.5 The inclusion of mitigation costs in project analysis has been widely used in economic analysis of environmental impacts of projects and is widely considered in the FAP. This approach includes within the project CBA the full costs (including investment costs) of producing output to make up the loss in capture fisheries. Although mitigation costs should be included as a cost element in the cost-benefit analysis of proposed projects, the mitigation approach is not recommended as a method *per se* for valuing the loss of fish production from capture fisheries.

3.6 In terms of the artificial stocking of floodplains in Bangladesh, a true estimate of the cost will be gained from the World Bank Third Fisheries project and Asian Development Bank second Aquaculture Project, both of which are currently engaged in large-scale trials of artificial stocking. However, some impression of the order of expenditure can be gained from the fact that \$US 19 million has been set aside solely for the purchase of fingerlings for the Third Fisheries Project, with which to stock 300,000 ha of floodplain over a five year period. This is without the indirect organisational and logistical costs and only takes into account 10% of the total floodplain area. The mitigation costs by adopting this approach are likely to be considerable.

3.7 The mitigation approach also has some serious shortcomings in terms of the needs of poor people: none of the technical approaches mentioned above are likely to fully mitigate the loss of access to capture fisheries, for a number of reasons:

- (i) Most approaches either explicitly or implicitly involve a strengthening of leasing

systems or private property rights, and therefore access for poor people is substantially reduced;

(ii) Stocking programmes and aquaculture require substantial resources for investment and annual operating costs, which by definition the poor do not have; and

(iii) Most stocking programmes and aquaculture are based on the major carp species, which are generally not the species consumed by the poor and which are generally beyond their purchasing power.

3.8 In sum, mitigation approaches, even where technically feasible, appear to imply a transfer of resources from the poor to the better-off, and possibly loss of income, employment and nutritional status for the poor. This transfer would be a direct result of the project. It is therefore essential, if mitigation options are being proposed, to

(i) assess the feasibility of and commitment to implementing the options; and

(ii) more clearly identify the social groups that will be affected by the various mitigation options.

4 Additional Costs to be Included in Cost-Benefit Analysis: Migration/Resettlement Costs.

4.1 An additional cost of allowing the decline of capture fisheries, is the loss of livelihood of professional fishermen and others whose survival strategies heavily depend on subsistence fishing. Many fishing communities have experienced out-migration, sometimes to India, as a result of the decline in catches, and there is a real cost involved even if no resettlement component is included in the project.

4.2 This approach can be seen as a form of mitigation measure which focuses on the people rather than the fish, in which case the cost calculated above would be added to the mitigation costs of the project. The cost can be measured by various indicators, for example the average cost of providing a job in the informal sector (e.g. rickshaw pulling) and/or the cost of relocating in town with minimum provisions. A rough relationship would then have to be established between loss of output and loss of livelihood in order to work out how many households might be affected in a particular project area.

4.3 Although this is a rough measure, it still improves on the conventional approach which ignores these negative effects. There is however a serious shortcoming in this approach: it gives the impression that alternative jobs can be found by those displaced. In a situation of high levels of un- and under-employment such an assumption should not be made lightly. In reality people may be forced into inferior jobs and inferior social conditions, families may be split up by the need to go outside for work, etc. The real cost including social cost is then likely to be much higher.

4.4 In conclusion, additional costs should be charged to proposed projects which cause a decline in capture fisheries: the costs of mitigation (if mitigation measures are proposed) and the costs of loss of livelihood. Some doubts must however be expressed over the

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efficacy of mitigation measures to fully compensate for losses experienced particularly by poor households when capture fisheries decline.

5 Distributional and Poverty Issues.

5.1 It should be stressed that, although the above approaches improve on the conventional approach, they still do not directly address the distributional implications of a decline in capture fisheries, with or without an increase in culture fisheries. The distributional impacts are likely to be negative however, and on the assumption that FAP projects are not intended to result in the poorest becoming still worse-off, project analysis must address this issue clearly. The following discussion suggests an approach which can be included as an element of the multi-criteria analysis.

5.2 The decline in capture fisheries has had negative impacts on poor households: both professional fishermen who have lost livelihoods, and the large number of poor rural households who depend on easy access to capture fisheries on the flood plains as an important food source.

5.3 The approach proposed here assesses what happens to the welfare of the poorest households when changes in the composition of fisheries take place. These changes are: (i) in terms of overall output, (ii) in terms of proportion of output coming from (open access) capture fisheries as against culture fisheries, and (iii) in terms of output of particular species.

5.4 Conceptually, we can look at the distribution of value of output (both output which is consumed directly and that which is sold) amongst different socio-economic groups. In principle, under a system of predominantly capture fisheries, a large number of households will derive benefit from direct consumption. Under a system of declining capture fisheries and some increase in culture fisheries, there will be a decline in access to subsistence fish for poor households, and an increase in income from fisheries going to better-off households. The same will happen where nominally open access fisheries are actually controlled by powerful individuals (which is often already the case).

5.5 This approach can be developed as an additional analysis within the conventional cost-benefit framework by applying a set of alternative distribution weights to the value of fish accruing to different social groups. This would test the sensitivity of net project impact to different assumptions on the distribution of income (conventional analysis implicitly assumes that society is indifferent to the distribution of costs and benefits, while an alternative assumption could be that the value of gains and losses going to the poorest groups has a higher weight than the value going to other groups).

5.6 Alternatively, such a disaggregated approach allows a stronger poverty-focused "bottom-line" policy to be considered such as "there should be no further reduction in present levels of nutrition and employment amongst the poorest households as a result of any project". A poverty-focused approach has a strong justification under the present circumstances in terms of the high occurrence of poverty in rural society and would ensure, at least at the level of project justification and planning, that the benefits currently accruing to poor households from capture fisheries would be maintained or be replaced or

20

compensated by alternative means.

6 Food Security / Nutrition

6.1 As fish from capture fisheries production represents a readily available food resource that is certainly a major nutritional benefit to the rural poor, it is essential to be very clear about the relevance of fish in the rural diet in order to ensure that mitigation and compensation procedures are effective.

6.2 If FAP accelerates the existing downward trend in production of fish and non-cereal food crops, Bangladesh may become ever more dependent on imported and donated food, as sources of these nutrients. From a nutritional perspective this increases the vulnerability of the population to malnutrition.

6.3 The costs to the national economy of a decline in a readily available resource of high nutritional utility are likely to be high: these potential costs may be avoided by careful planning which takes steps to prevent the decline of the resource.

6.4 Likely nutritional effects of the FAP on low-income households are an increase in household food security as far as staple foods (rice) are concerned, and a decrease in foods that supply several essential nutrients. Small fish capture in particular fills gaps in the diets of low-income households at lean seasons of the year. It is also possible that marked differentials in nutritional status may be seen among population groups, with some low income groups experiencing more malnutrition.

6.5. The basic food pattern of Bangladesh, in order of amounts consumed per day, is : rice, vegetables, fish, dairy products, pulses, oil, meat². Compared with national averages, low income households tend to consume less meat, oil and dairy products, and the larger, more expensive fish, while consuming more small fish and vegetables. Changes in the availability of rice, vegetables, small fish, pulses and oil may have considerable impact on them.

6.6 This dietary pattern, similar to many in other low-income groups, is heavily dependent for nutrients not only on the staple food (rice) but on the secondary foods fish, pulses, vegetables, oil and dairy products. While it is correct to assume that protein shortages will not occur if adequate energy is supplied by a rice-based diet, other nutrients must be considered. The principal dietary deficiency in Bangladesh after protein-energy malnutrition is of vitamin A³, which causes impaired resistance to infection, and in severe cases blindness. Vitamin A from plant sources cannot be absorbed without dietary fat; sources of the vitamin and of fat should be safeguarded.

6.7 The nutrient content of the small Bangladeshi fish, such as are caught and eaten whole by low-income families, would be expected to supply protein, calcium and variable

² National Nutrition Surveys 1975-6 and 1981-2.

³ Goitre (iodine deficiency) is also important in Bangladesh. However it is not considered here because it is marine foods which contain iodine, and all inland foods have equivalently low levels.

amounts of fat and vitamins A, B group and D, if eaten whole.

6.8 Intakes vary from small amounts late in the dry season and in the early rains to relatively large amounts after the rains, while the floods recede. It is at this time that supplies of other foods, such as rice, tend to be low and therefore fish partially compensate for shortfalls in other food commodities; the peak of fish availability is an important resource. In addition, small fish capture is particularly valuable for the landless after the rice harvest, when demand for their labour falls off.

6.9 The nutritional importance of pulses⁴, oilseeds and vegetables can hardly be over-emphasised. Their production has been declining in Bangladesh over the past 10 years and more, in consequence of increasing production of HYV aman rice, boro rice, and winter wheat. This trend can be seen in the national nutrition surveys and in markets, where some indigenous foods such as mustard oil are in very short supply. Dairy products, although not available to the poorest households, are also important. Although increased rice production should bring the benefit of more and cheaper available energy, protein, iron and B vitamins, reduction in availability of fat⁵, calcium and vitamin A would be a real disbenefit.

6.10 The principle of increasing, rather than decreasing dietary variety from indigenous foods should be a consideration with any programme of the scale and type of the FAP, which affects the livelihoods of large numbers of people. To cut down the range of foods available to low-income communities is to render them more vulnerable to malnutrition as well as to reduce their quality of life.

6.11. It may be suggested that shortfalls in dietary nutrients can be met through increasing food imports, from food aid, and from special feeding and supplementation programmes. None of these measures is likely to reach the majority of rural poor, as long as the distribution infrastructures remain as they are. For example, the vitamin A capsule distribution programme is only reaching 35% of children. Reliance on food aid and donor programmes generally is not a prudent long-term strategy for securing food intakes, although they are of value in emergencies.

6.12 Although adequate protein levels can be attained if energy requirements are being met, it is clear that a large proportion of rural households do not in fact satisfy their basic energy needs. The 1988-89 HES found about 48% of rural households with consumption levels below 2122 K.cal./day/person (the definition of absolute poverty) and about 29% of rural households with consumption below 1805 K.cal./day/person ("hard-core poverty"). For these households the availability of cheap fish at certain times of the year is likely to be an important component of their overall survival strategy.

⁴ Khesari, is grown mainly as a fodder crop but is also eaten by humans. It is not toxic unless eaten in large amounts, as when cereal crops fail. Other pulse crops are non-toxic.

⁵ Fat has a bad name in affluent countries for its association with heart disease. It is however an essential dietary component. Fat intakes in Bangladesh are around 10% of dietary energy; the recommended levels are 30-35%, and the intake in the UK is about 40% of energy.

7 Conclusions

7.1 Production of fish and of important non-cereal foods is already on the decline in Bangladesh; the FAP has the potential to accelerate this trend. Farmers are choosing to grow irrigated rice rather than other crops because they perceive this as a reasonable strategy. Unfortunately landless and poor urban households then suffer from decreased intake of essential nutrients and malnutrition may increase in some groups.

7.2 If alternatives to traditional small-scale capture fisheries could be developed for low-income households, and if farmers could be encouraged to return to non-cereal crops, through extension programmes, then in theory the negative nutritional impacts of loss of capture fisheries production could be mitigated. However, a realistic assessment of the feasibility of such programmes must be taken into account before such recommendations are accounted for within project analysis.

7.3 It must be stressed that the market price of fish is the outcome of many social and economic factors affecting supply and demand of fish and as such, does not exclusively capture the value of fish as a source of nutrition. This consideration is especially relevant to FAP, given the special place of fish in the diet of rural Bangladesh, where the costs and benefits of flood control to agriculture and fisheries production are critical issues in assessing the consequences of implementing the Flood Action programme.

