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AFSPAN Work Package 4

Information/best practice/policy briefs presenting major findings

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Contents

Key finding brief: Toward a more comprehensive understanding of aquaculture development and its impacts on poverty and food security

Twelve case studies from eleven countries in Asia, Africa and Latin America, compiled in order to: (1) Assess financially viable entrepreneurial aquaculture activities including small-scale operations and their contribution to poverty alleviation and food security; (2) Identify enabling institutional conditions and arrangements for food security and poverty alleviation, and; (3) Identify successful public-private partnerships contributing to aquaculture development in developing countries.

The cases covered a diverse range of aquaculture systems with highly varied socio-technical characteristics. The range of the systems selected for comparison is unusual in its scope and breadth, (in terms of the geographical location, species farmed, culture environments, farming technologies, scale, capital intensity, market orientation, institutional arrangements, and women's participation) making possible a broad analysis, capable of drawing out similarities in underlying developmental processes and outcomes operating at different a range of spatial locations and scales.

Two conceptual frameworks were adopted as a means of structuring analysis of these diverse systems. The first was a quadrant, which posits series of potential direct and indirect linkages among aquaculture, poverty, and food security. Case study content analysis revealed a broad array of examples of linkages falling under each category, validating this conceptual approach. The second conceptual framework was a binary one, distinguishing two modes of development: interventionist and immanent. Interventionist development was defined as an intentional process, driven primarily by the state and other developmental actors, while immanent development is seen as a more 'organic' process, arising in response to market signals and driven primarily by the efforts of private sector actors. Country case studies illustrated the existence of a range of development processes falling along this spectrum, including many in which strong complementarities exist between the two.

Direct and indirect poverty and food security linkages

Key findings emerging from the first set of analysis described above are summarized as follows:

- **Direct consumption linkages:** Case studies from India, Kenya, Uganda, Ghana and Bangladesh all provided evidence to support the existence of elevated levels of fish consumption among fish producers, indicating a correlation between adoption of aquaculture and increased levels of home consumption of fish. However the example from Ghana cautions that direct food security impacts of production may not always be well defined, and in some cases may not occur at all.

- **Indirect consumption linkages:** Case studies from Kenya, India, Ghana and Bangladesh presented mixed findings with respect to the impacts of indirect aquaculture - fish consumption linkages on food security. Although the cases present strong evidence that increased aquaculture production resulted in increased availability of fish through the market and (in at least one case), reduced fish prices, it was not clear on the basis of the evidence presented whether this increased availability was in itself sufficient to guarantee that poor consumers' access to fish increased. In part this was because in the examples presented, production

concentrated mainly on high value species. However, it should be noted that in many countries low and medium value fish species account for a large proportion of fish produced. Further research taking into account effects operating at a range for scales, is required in order to obtain a more complete understanding of these issues.

- **Direct income linkages:** Case studies from Viet Nam, Kenya, India, Philippines, China, Brazil, Nicaragua, Bangladesh and Ghana indicated how increases in income derived from direct participation in aquaculture may translate into improvements in living standards, which may occur immediately or be transmitted intergenerationally. Although households which practice aquaculture are less likely to be poor than those that do not, the qualitative nature of the case studies meant that it could not be determined with certainty whether this is because better-off than average households take up aquaculture, or because poor households taking up aquaculture became better-off than average as a result.

- **Indirect income linkages:** Case studies from Chile, Nicaragua, Philippines, China, Ghana, Kenya, Viet Nam, India and Bangladesh investigated two categories of indirect income linkage; employment generation, and economic multipliers. The levels of income gained from temporary and permanent employment on-farm and off-farm in the provision of services in related value chain activities span a wide range, as does employment intensity (the number of jobs created per area land or unit of capital investment). This variability reflects the range of local economic contexts in which aquaculture occurs and the labour intensity of different production technologies. One consistently observed pattern was that wages and terms of employment in aquaculture were generally favorable compared to those in other agricultural sectors. In some cases, demand for labour in aquaculture averaged over the course of a year was actually higher than demand for labour in agriculture. Important differences in employment intensity exist between commercial and small scale systems and production technologies. Small-scale pond aquaculture in Ghana performed better than commercial cage culture, with smallholder-dominated commercial aquaculture systems generating much higher levels of employment than semi-subsistence ones in Bangladesh.

- The Ghana study quantified the economic multipliers generated by the procurement of local goods and services using incomes derived from aquaculture by producers and workers. These multiplier effects are extremely important in terms of their implications for economic development and poverty alleviation. The study found that commercial cage culture generated lower consumption linkages per unit of capital investment than small-scale pond aquaculture, although the former created higher levels of employment.

Policy brief: Recommendations for best practice in aquaculture development

This brief presents key findings and best practice recommendations for stimulating aquaculture development which contributes to poverty reduction and food and nutrition security, derived from twelve case studies from eleven countries in Asia, Africa and Latin America as an output of the Aquaculture for Food Security, Poverty Alleviation and Nutrition Project. These case studies demonstrate that aquaculture has the capacity to contribute to poverty reduction and food security via a number of direct and indirect linkages. These recommendations are summarized below.

- With respect to food security, the largest gains occur at the meso and macro scales, where the expansion of aquaculture is sufficient to significantly increase fish supply, thereby reducing the price of fish relative to other commodities, bringing about increases in availability and accessibility. However, increases in fish supply do not automatically result in improved accessibility for poor consumers if the fish produced are high value species. Aquaculture developers should consider consumers as well as producers when making decisions regarding which species to promote.

- Numerous case studies demonstrate that adoption of aquaculture results in direct increases in fish consumption for producer households, resulting in greater food security. However, in many cases aquaculture producers are not among the poorest households in any given community, and aquaculture producers represent a small share of total population. Promotion of smallholder-inclusive commercial aquaculture which produces a substantial marketable surplus is therefore likely to bring about wider reaching gains in food security than promotion of subsistence or semi-subsistence forms of the activity which benefit a more limited numbers of adopting households.

- Direct participation in commercial forms of aquaculture by small and medium scale producers brings about clear benefits to these adopters in many instances, through income effects (since aquaculture usually generates far better returns than the production of agricultural staple crops). These may be immediate, but may also have longer run intergenerational effects (for instance, by providing funds to educate children to so that they are able to pursue better paid non-farm jobs). Although resource constraints sometimes preclude direct participation by the poor in such forms of aquaculture as producers, the cases show that this is not always the case. Furthermore, commercial smallholder dominated forms of aquaculture also generate substantial employment, both direct on-farm and (more significantly) in provision in a range of related services up- and down-stream value chains. The conditions and remuneration of this employment are often favorable to those in alternative occupations such as agricultural labour.

- In contrast, while larger scale operations create some jobs, they tend to bring about less inclusive benefits, both because the number of producers directly involved is far lower, and also because the concentration in access to land required to facilitate large scale production excludes non-producers who may have obtained benefits from access to this land prior to its conversion to aquaculture. Whilst small-scale subsistence or semi-subsistence aquaculture provides some direct benefits to

producers, generally has low labour demands, requires few inputs, and generates limited surpluses. It thus creates few positive economic spillovers. In many cases, interventions which aim to stimulate the development of productive commercial aquaculture with high numbers of small and medium scale entrants are therefore likely to result in the most substantial and broadest array of benefits

- For interventions, the highest chances of success occur where favorable immanent conditions exist, or can be stimulated. Thus, there is little sense in promoting aquaculture in an area where there is no access to markets (for instance, in a remote area with very poor transport and communications infrastructure and a low population density), or a reliable supply of production inputs is not available. In these cases, interventions such as investments in road or construction or canal renovation, or the relaxation of import duties on feed materials, or the provision of specially tailored bank loans to prospective hatchery operators to are likely to deliver a higher chance of kindling success than, for instance, a program of pond construction and extension. In other words, interventions should focus on areas where the chances of success are highest, or work to change the structural conditions which hamper the possibility of achieving economic development in those which are not.

- Although attention often focusses on production for export, the expansion of domestic markets in line with economic growth and urbanization in Asia and, increasingly, Africa, is by far the most important driver of aquaculture development globally. The case study of shrimp production in Brazil, summarized in this report, shows that even aquaculture which developed to serve export markets may increasingly serve domestic demand as incomes rise. Policymakers should therefore avoid the tendency to favor export-oriented production over that which is responsive to domestic demand.

- Case studies presented in the report reveal cooperatives are highly variable in terms of their efficacy in enhancing productivity, profitability and market access for producers and providing opportunities for upgrading production. The most effective arrangements occurred where arrangements were mutually beneficial for producers and input suppliers, and where buyers, processors and distributors were integrated as cooperative members, facilitating “win win” scenarios. The effectiveness of cooperatives were also strengthened by close collaboration with government institutions for the provision of demand driven technical support, such as disease diagnosis and treatment, and the provision of assistance in attaining legal compliance with environmental legislation. Cooperatives functioned less successfully, and sometimes failed, where clear cut incentives such as these did not exist.

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