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IFPRI

**RESEARCH
PROJECT
MISSION**

Intrahousehold resource allocation can predict the outcomes and consequences of policies targeted at households or individuals. With this knowledge and understanding, the research team aims to generate information that will assist in the development of policies, programs and projects that take intrahousehold allocation processes into account.

GENDER AND INTRAHOUSEHOLD ASPECTS OF FOOD POLICY

PROJECT BRIEF No 2 • APRIL 2000

Commercial Vegetable and Polyculture Fish Production in Bangladesh: Their Impacts on Income, Food Consumption, and Nutrition

Food-Based Strategies to Reduce/ Eliminate Micronutrient Malnutrition

In rural areas of Bangladesh, poverty is pervasive and associated with high rates of malnutrition especially among preschool children and women. Apart from low levels of energy intakes, it is increasingly recognized that rice-dominated diets such as those consumed by most poor in the countryside may not supply all micronutrients required for a healthy life and productive activities. Children and women are particularly vulnerable to these micronutrient deficiencies as they face relatively higher requirements for growth and reproduction.

Poor dietary quality is a primary cause of micronutrient deficiencies. Low intake of vegetables, fruits, pulses, fish, and animal products are compounded by frequent attacks of diarrhea and other infectious diseases in a spiral of increasing deficiencies. Nonstaple foods, particularly animal products, are rich sources of bioavailable minerals and vitamins, but too expensive for the poor to buy in sufficient quantities.

There is considerable interest in "food-based" strategies to alleviate micronutrient malnutrition, interventions that can complement supplementation and fortification programs and seek directly to improve dietary quality. Promotion of polyculture fish and vegetable production, two foods relatively rich in micronutrients, holds potential for improving micronutrient status in Bangladesh (i) by increasing the supply of micronutrients to the general population and so lowering prices or maintaining constant prices in the face of rising demand due to population and income growth and (ii) by directly improving household incomes and intakes of fish and vegetables of producing households.

The present study has examined three NGO programs through which production of polyculture fish and commercial vegetables have been promoted through provision of NGO credit and training

programs directed at women: (1) commercial vegetable production in Sauria; (2) polyculture fish production in household-owned ponds in Mymensingh; and (3) polyculture fish production in group-managed ponds in Jessore.

Effects of Adoption on Household Income

Although apparently highly profitable as compared with rice, the two technologies studied contribute rather modestly to overall household incomes. Because of the high profitability of the polyculture fish and commercial vegetable production on a per acre basis, the potential exists for much higher impacts on household income, if land devoted to production and other inputs were to be increased. A priority for research would be to understand what are the constraints to more intensive adoption by adopting households.

Income, Food Prices, and Food Expenditures

Rice consumption does not vary significantly by income group, suggesting that consumers at all income levels give high priority to satiating hunger through rice consumption first. In contrast, animal and fish consumption rises rapidly with income on a percentage basis, roughly doubling between low and high income terciles for the surveyed households. Nonstaple plant food consumption rises by a slower rate with income. There is roughly a 50 percent increase in intakes of nonstaple plant foods between low and high income terciles. Although animal and fish consumption accounts, on average, for only 3 percent of total energy intake, because of their high cost it is striking that animal and fish consumption accounts for 20-25 percent of food budgets on average.

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Intrahousehold Food Distribution

Preschoolers appear to be favored in intrahousehold distribution of food, particularly preschool boys who receive a disproportionate share of animal and fish products, which are the most expensive sources of energy and account for a high percentage of foods purchased at the margin as income increases. It is adult women who tend to receive disproportionately lower shares of preferred foods. Although the energy intakes of adult women are, of course, substantially greater than those of preschool children, consumption of animal and fish products is about equal between adult women and preschool boys.

Effects of Adoption on Own-Consumption

The adoption of the polyculture technology does lead to greater consumption of large fish, but not of fish consumption in total. There is apparently a one-for-one substitution of small fish in non-adopting, fishpond-owning households. Although the magnitude of this substitution is small, nevertheless it should be noted that small fish are more nutritious gram-for-gram than large fish, so that the impact on dietary quality is negative. If scientifically feasible, there would seem to be a large opportunity for profitable production of small fish in privately-owned fishponds if these small fish could be harvested during February through August when small fish prices are seasonally high.

Similar to the results for polyculture fish production, producers of AVRDC-target vegetables do not consume disproportionately high amounts either of AVRDC-target vegetables or vegetables in total. A plausible explanation is that demand for vegetables does not increase with income, that is, there is no latent, unsatisfied demand to be met. Production and marketing efforts need to concentrate (i) primarily on extending growing seasons in order to dampen seasonal price fluctuations and (ii) perhaps secondarily on improving marketing channels so that vegetables may move cheaply and freely about the country in order to take advantage of differential regional growing seasons.

Effects of Technology Adoption on Nutritional Outcomes

There is little reason to believe that adoption of the two technologies under study has improved the micronutrient status of members of adopting households through better dietary quality. There was no finding of disproportionately high own-consumption of fish and vegetables by adopting households. Impacts on overall household income, although positive, are not strong.

It is consumers in general, both non-adopting and adopting households, who benefit nutritionally

from research, extension, and credit programs, such as those studied in this report, to increase the market supply of vegetables and fish. All other things being equal, increased market supply will lower prices for these foods. Demand estimates demonstrate that consumers are price-responsive. Consumption of these foods will increase if prices decline. Conversely, if policies are not undertaken to increase supply, prices of nonstaple foods will almost certainly continue to increase in the face of population growth and nutritional status will be further compromised.

Improvements in Household Income and Implications for Agriculture Policy

Rural incomes are quite diversified. No one single new technology will raise the incomes of a high proportion of low-income households by several multiples in just a few years. A range of new technologies needs to be continually improved and refined through research. Farming households must be taught to use the new technologies and to learn to adapt them to their specific conditions.

Commercial vegetable and polyculture fish production are promising, viable components of an overall agricultural development strategy, which perhaps might now best rely on nonstaple food products as key sources of productivity growth. Although not analyzed in depth, the livestock sector emerged as an important source of income to rural households as well as a key source of micronutrient-status-improving food products. For various types of livestock, it is useful to compare profitability, labor use, and constraints to increased production with rice, vegetable, and polyculture fish production.

Because poor nutrition results in high losses to productivity and individual welfare, and can only be improved gradually through income increases generated by agricultural development, specific interventions to improve micronutrient status in the short-to-medium term can provide a high return to investment. With respect to improving iron status, this report finds no evidence that diet-based interventions could be successful. The cost of animal and fish products is simply too high with respect to consumer purchasing power.

Diet-based interventions, however, may well be possible for improving vitamin A status in that vegetable sources of beta-carotene are well within the purchasing power of poor consumers. The problem would appear to be one of consumer motivation—informing and convincing consumers of the benefits of pro-vitamin A consumption and providing the knowledge of which vegetables are rich sources. Education is key because there does not appear to be a strong, latent demand for vegetables, as there is for animal and fish products, as income increases. ■

ABOUT IFPRI

IFPRI's mission is to identify and analyze strategies for meeting food needs of the developing world, with particular emphasis on low-income countries and the poor.

IFPRI is a member of the Consultative Group on International Agricultural Research (CGIAR).

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