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## **Post-Harvest Processing as Key to Philippine Subsistence Fishery and Rural Development Strategy**

In the course of deciding the topic of my essay, I initially wrote about the plight of poor rural farmers in the Philippines. With the help of my mother's colleagues at the University of the Philippines and International Rice Research Institute, I thought writing this essay would be a breeze. I was able to get authoritative information on the topic and, like everybody else, assumed rural rice farmers were among the most impoverished in the country. And the facts seem to support this. Of the 7,107 islands comprising the Philippine archipelago, half of its 103 million people reside in rural areas where they live off on just 19% arable land ("The World Factbook 2009"). As a result, the Philippines face perennial deficits in rice production and have to import rice from its more geographically endowed Southeast Asian neighbors (Dawe, "The Philippines imports rice" 7).

Philippine agriculture consists of farming, fishing, and forestry (Balisacan & Hill 14). Rice farmers, corn farmers, coconut farmers, landless laborers, fishermen and animal producers comprise the bulk of the Philippine agricultural labor force (Casiwan 31). Broadly defined, the agricultural sector provides a major source of income and employment for the country, accounting for about 70% of the labor force and 40% of GDP (Balisacan 188-189). Agriculture also affects the rest of the economy as a "supplier of food, raw materials, and demand for non-agricultural inputs and consumer goods and services" (David 175). Hence, sustained agricultural growth is key to the economic development, nutrition, food security and environmental sustainability of the country (Balisacan 339). But, are rice farmers really the poorest?

- In the 1970's, the "success of Green Revolution in rice and expansion of irrigation increased the country's comparative advantage in rice production, turning the Philippines from a net importer to being self-sufficient" (Balisacan 188-189).
- From 1991-2002, the price of palay in the Philippines was about 21% to 66% higher than other Asian countries. An IRRI-PhilRice study from 1994 to 1999 found Filipino farmers were paid almost double what farmers in nearby countries received. (Cabling & Dawe, "Filipino farmers" 9).
- Data show that among developing Asian countries, annual net returns per hectare were highest in the Philippines due to high farm prices of palay (Cabling & Dawe, "Filipino farmers" 10).
- Rice farmers have higher income than the other farmers' groups due to "higher per capita income from crop farming, non-agricultural wages and receipts from abroad." (Casiwan 33).
- The Family Income and Expenditure Survey shows poverty incidence to be disproportionate and highest among the agricultural sector (Balisacan 328). Broken down into crop farmers, landless laborers, fishermen, or animal producers, "annual per capita household income of rice farm households are up to 67% higher than any other category of farmers/fishermen" (Casiwan 29). "Although two out of five rice farmers are still poor, an even greater percentage (50% to 70%) of corn farmers, landless laborers, and fishermen live below the poverty line" (Casiwan 31).
- "Rice farmers work less than 40 days per year in the Philippines or in most of South and Southeast Asia" (Dawe, "Farm laborers" 23). Most of the work is done by landless rural laborers, who must also catch fish, work in public transportation, or till the land owned by others just to make ends meet.

Constituting 13% of the rural labor force, hired workers does more than 70% of labor on rice farms in the Philippines. "Many spend 25-30% of their income just to buy rice - before even considering meat, fish or vegetables to feed their family" (Dawe, "Farm laborers" 24-25) - making fishermen and landless workers highly vulnerable to commodity and food price increases (Balisacan 320). Unfortunately, they also

remain unrecognized, voiceless and under-represented even at the local level. This is why I decided to focus my essay on the plight of the rural subsistence fishery, the poorest, the least understood and the most neglected sector of the Philippine population.

### **The Philippine Subsistence Fisheries:**

The huge Philippine territorial sea of over 2.2 million km<sup>2</sup> helped develop fisheries as a major sector of the economy. Fisheries contribute 2.3% of the gross domestic product (valued at more than PhP 76 billion in 2000) or about 18.8% of the total agricultural sector - greater than the share of livestock, poultry and forestry (Green 7). Aside from fishers, many people also depend on fisheries, including seafood processors, fishmongers and various ancillary industry workers. Fish provides direct income to some 1.36 million small fishers and their families, generating an average monthly earning of PhP 4,000 per household or over PhP 62 billion per year (Green 7). Traditionally considered as the “employer of last resort,” rural Filipinos still regard the sea as a place for families to make a living.

The Philippine municipal fishery is made up of small-scale fishers fishing in waters up to 15 kilometers offshore with boats less than 3 gross tons. Most of the poor, rural subsistence fishers belong to this group. The United Nations Food and Agricultural Organization (UN-FAO) defines subsistence fishery as a “fishery where most of the fish caught are consumed directly by the families of fishers rather than bought and sold in the market” (“The Republic of the Philippines”). Typical rural subsistence fishers usually sell their catch right on their traditional landing site, where a middleman buys the fish and either sells them in the local wet market or to wholesalers. Fish processing is done usually by women or typically wives of fishermen (“The Republic of the Philippines”). In some areas, the catch of municipal fishers goes directly to local moneylenders to pay for debts incurred during the lean season, thereby perpetuating a cycle of poverty and indebtedness. Due to its perishable nature, fish are almost always marketed locally within a few hours. Mark-ups at each stage of the marketing chain range from 10% to 50%, making farm-gate prices generally less than half of the retail prices (BFAR 2-21). Commercial fishers, however, operate vessels over 3 gross tons and utilize modern fishing gears to catch fish in deeper waters. From their home base in big fishing ports, these fishers range far and wide to catch fish destined for processing plants or wholesale auctions supplying major urban markets, internationally and locally. Of the 43 million people living in coastal areas, fishing employs 1.36 million or 5% of the country’s labor force, the majority of which (68%) are municipal fishers. Commercial fishers constitute only 6% of the labor force (Green 34).

Life in the Philippines differs dramatically depending on whether one lives in a major city or in its poorer outskirts. For example, compared to the national literacy rate of 92.6%, the majority (78%) of rural fishing family household does not complete an elementary education and only 30% of those who start grade one enter high school. These households have lower rates of access to basic needs such as safe water, toilets and electricity in their makeshift houses. Inadequate health care facilities, poor road infrastructures needed to access services elsewhere, urbanization and unequal land distribution have led to deeply entrenched poverty in coastal areas. As a result, the University of the Philippines’ National Health Institute estimate that more than 70% of Filipinos who succumb to sickness die without ever seeing a doctor (“Lightweight”). As a rice and fish-eating nation, fish is a major component of the people’s diet, accounting for over 50% of the total animal protein consumed in the Philippines (Green 13). Overfishing has led to a cycle of declining catches, increasing prices, escalating damage to habitat and significant human costs, especially for the typical subsistence-fishing household of five making only a meager income of PhP 50,000 (vs. PhP 144,000 for rice farmers) (BFAR 2-9). For example, according to the Food Nutrition Research Institute, a typical Filipino’s intake of 1,684 calories per day is only 87.8% adequate based on the average needs suggested by the FAO (Co, Fernan III, and Ana III 20). With the globalization of food markets and growing dependence of the Philippines on food imports, Filipinos needed more cash to buy food. Instead of improving, however, the socio-economics of small-scale fisheries has deteriorated in recent years. In a 2002 survey (Co, Fernan III, and Ana III 37), up to 80% of

the fishing households were found living below the poverty threshold. Food takes nearly 60-70% of household income, and the quality is not remarkable (Co, Fernan III, and Ana III 17). This trend coincides with a drop in national per capita consumption of fish from 40 kg in 1987 to 24 kg in 1996 (Green 13). With the Philippine population increasing at 1.78% annually, the future looks grim for the overall food security and nourishment of the country (“The World Factbook 2009”).

### **Key Fishery Resource Problems and Issues:**

In a country where marine capture fishing is the sole source of livelihood and cheap animal protein for a significant portion of the population, food security is inevitably linked to the health and sustainability of the sea. Whether it can continue to support millions of fishers and their families who rely on it for income and sustenance will depend on how the country address the following key resource problems and issues:

(1) Overfishing and habitat destruction. The UN-FAO estimated that since 1990, approximately 25% of the world's fish stocks have been overexploited, depleted, or are recovering from depletion (Green 6). At the current rate of exploitation, Daniel Pauly estimates that "many stocks could be eliminated within 25 years and we may well end up with a sea of jellyfish" (44). With excessive fishing practices, total habitat degradation and high population growth rate, the Philippines is on its way to destroying its fisheries for good. Up to 75% of the country's coral reefs are now degraded and mangroves have shrunk from 450,000 ha in 1918 to 138,000 ha in 1994, making the national expansion of aquaculture questionable. Even remote places like Palawan have been overwhelmed by the sudden and unanticipated growth of population brought about by tourism and migration ("The Republic of the Philippines" 2-6).

(2) Lack of effective fisheries management and enforcement. Central to effective fisheries management is the ability of governments and communities to coordinate and control excess fishing capacity and effort. This requires management structures and enforcement mechanisms that can keep pace with harvesting technologies and drivers of exploitation, such as the pursuit of profits, population growth, and need for food and employment (Green 51). The complexity of tropical marine ecosystem and multi-species nature of the fishery calls for a very different kind of economics (i.e., one that considers the benefits and costs of individual fishing boats and fishing fleets as well as fishing households and communities), a good understanding of human behavior, and a management paradigm beyond command and control (Green 60). As an "employer of last resort," decision-makers and the general public must take into consideration the socio-economic needs of the poor and balance them with conservation requirements. Despite the Philippine Fisheries Code of 1998 that decentralized decision-making to communities, to date, "most of coastal fisheries in Southeast Asia remain overfished or undergoing overfishing" (RA 8550; Berkes 224).

(3) Lack of employment and alternative livelihood opportunities. According to Liese, “Empowering fishers to pursue higher income outside of fishing will reduce the fishing pressure on the resource,” and “The best incentive ‘not to fish’ is raising the opportunity cost of time of the fishing households.” Hence, instead of governments forcing people not to fish and spending enormous amount of money and resources on enforcement, this conservation approach addresses key fishery resource and rural development issues by promoting alternative livelihoods and enhancing the education and job skills of subsistence fishers. And studies support this assertion. For example, Balisacan found that "removing within-region income disparity would reduce overall inequality in the Philippines by at least 82%" because "disparities in income and human achievement *within* each of the regions or areas of the country is the major problem, not disparity between regions, between urban vs. rural areas, or between agriculture vs. industry” (239, 330). Hence, local job creation will go a long way towards improving the quality of life of poor rural subsistence fishers while conserving fishery resources and marine habitats at the same time.

## **Post-Harvest Processing as a Viable Alternative Fisheries Development Strategy:**

In conclusion, a *sustainable development* approach is needed to effectively address the issues mentioned above - one that "ensures the limited quantities of fish available are used efficiently as possible to meet many of the nutritional, employment, social and economic development goals of the country" (Charles 54). This is a radical departure from ways governments approach the problem. Instead of emphasizing the biological aspects of fisheries, this alternative points to the importance of the post-harvest sector as a key component of a viable rural subsistence fisheries development strategy. More specifically, this calls for "reducing waste and post-harvest losses, maximizing *value added* through appropriate processing, developing and/or improving distribution and marketing systems, and integrating the fishery in the overall rural development effort" (Charles 54). The following are some recommendations to make this happen:

(1) Reduce waste and post-harvest losses. At the 2012 Institute of Food Technology Convention, PepsiCo's Chief Scientist, Dr. Mehmood Khan, lamented that, "In Africa, Asia, and India, about 40% of the food is lost through spoilage due to the inability to preserve and transport it. The road infrastructure in large cities of developing countries is so poor that PepsiCo's delivery trucks spend large amounts of time sitting idle in traffic jams, wasting fuel and energy" (Khan). Likewise, a typical subsistence fisher catch only 10 kg of fish per year, however, FAO estimates that a measly 7 kg of will be sold and the rest goes to waste due to inadequate handling ("The Republic of the Philippines" 2-10). In many rural fishing communities, fish caught by municipal fishers usually stays within the town boundaries. Without any form of preservation, available cold storage facilities or good transportation system, most fish can only be sold fresh at the local wet market for a few hours before it spoils. Hence, government investments in these infrastructures make sense from an economic, conservation and nutrition stand point as reduction in post-harvest losses allows for a 30% reduction in fishing effort while still maintaining a steady supply of quality seafood to consumers.

(2) Maximize *value added* through appropriate processing. The Philippine fishery industry should re-focus its strategy away from selling cheap raw commodities to developing markets for value-added seafood products like fillets and ready-to-eat seafood dishes. For example, what started as locally minced products such as fish balls, fish sausages, squid balls and fish nuggets (basically "street food") are now becoming popular and common in many supermarkets. A number of milkfish processors are converting their by-products to value-added products, such as fish rolls and dumplings, to maximize product utilization and minimize waste. This offers opportunities for fishers and their families to establish micro-enterprises specializing in variety seafood products. To be competitive in the global market, however, the Philippine value-added-product industry needs to "upgrade its technology and quality standards, including in-plant hygiene and sanitation" ("The Republic of the Philippines"). Likewise, a quality culture should be inculcated throughout the whole value chain. This means education on strict hygienic handling of fishery products, international seafood quality and safety standards, and market opportunities for value-added products should be provided to everyone who sell, handle, process and transport fish. Establishment of a reputable and internationally recognized product quality certification program or competition (like the Deming Prize for manufacturing excellence in Japan or Thailand's seafood product certification program) coupled with government support of international marketing and promotion efforts will go a long way towards improving the quality and global competitiveness of the Philippine seafood industry.

(3) Develop and/or improve distribution and marketing systems. Post-harvest handling practices are prerequisite to maintaining fish quality and reduction of wastes. This requires education and adherence to strict quality standards at all levels. For fish distributors, proper icing and use of cheap styrofoam boxes should be encouraged to keep fish fresh for longer periods. Unfortunately, of the 23 government-owned ice plants designated for local fishers, less than half are still running (BFAR 2-26). However, this presents opportunities for local fishery households to form marketing cooperatives that could eliminate the middlemen, take over the marketing or processing of seafood products, or even the commercial operation

of inefficiently run government ice plants. As in recommendation (1), improvements in rural-urban roads are needed since "high transport costs lead to geographic 'poverty traps' that prevent the poor from tapping external markets or taking advantage of economic opportunities elsewhere" (Balisacan 330).

(4) Integrate fisheries in the overall rural development effort. Integrating fisheries with other coastal industries supporting rural development strategy opens up new opportunities and creative ways to improve the lives of subsistence fishers and their communities. It also helps to regard the industry as a series of products/processes linked together in the whole seafood value chain that starts from fishing to handling, processing, marketing and transport of fish all the way to the consumer's plate. At each step in the chain, product price increases as value is added, or as new products are created. It should be noted that post-harvest processing is the only component of the marine fishery industry where new seafood products are made. Hence, my emphasis on post-harvest processing as a viable strategic entry point to improve the lives of rural subsistence fishers (especially women), reduce income inequality and poverty, minimize waste, conserve natural resources, and strengthen the food security of the country.

Another practical aspect of using the seafood processing industry as a platform for rural development is its scalability. For example, a "patis" (fermented fish sauce) or a comminuted product factory can be established as a profitable business either as a small family enterprise catering to the local community, a medium-sized cooperative serving regional markets, or a large corporate business targeting national or international markets (Satake 166-213). Scalability is also important in another critical aspect of rural development programs - financing. Formal financial institutions, like private commercial banks, do not issue loans to poor people who do not have collateral. This is where government agencies can help. For example, under the coordination and leadership of the Department of Agriculture, the following public institutions should expand their programs to provide business assistance to rural fishery enterprises (Satake 100-108): (a) Technology Training - Philippine Trade Training Center of the Department of Trade and Industry (DTI), and Technical Education and Skills Development Authority of the Department of Labor and Employment; (b) Research and Management - Industrial Technology Development Center and the University of the Philippines Institute of Small Scale Industries; (c) Marketing and Promotion - DTI Bureau of Export Trade Promotion and Bureau of Domestic Trade Promotion; and (d) Financing - DTI Bureau of Small and Medium Business Development, People's Credit and Finance Corporation/Asian Development Bank, Small Business Guarantee and Finance Corporation; Land Bank of the Philippines, and Development Bank of the Philippines. Complementing these government business assistance programs are micro-finance mechanisms like rotating savings and credit associations (ROSCA), rural credit cooperatives, or Grameen Bank-type micro-lending institutions (Armendariz & Morduch 57-73). The latter are suitable for financing small start-up family businesses like fish processing or marketing cooperatives and should be encouraged in rural fishing communities (Satake 69-114).

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