

The Philippines is an archipelagic country rich in living aquatic resources. In 2004 it ranked 9<sup>th</sup> highest worldwide in total fish production, and 3<sup>rd</sup> in aquaculture production. However, fishing communities remain among the poorest of the rural poor. Degradation of the environment and natural resources threatens the livelihoods of millions. Furthermore, the globalization of fisheries marketing compounds the uncertainty of the economic environment for fisheries.

Given the importance of fisheries in rural development, and the pioneering role of the country in tropical aquaculture and capture fisheries, the literature on policies and development strategies for the sector has burgeoned. This paper synthesizes this literature to arrive at a coherent sector assessment and set of policy recommendations.

**The fisheries sector**

1. The marine waters of the Philippines cover an area of 2.2 million km<sup>2</sup>, surrounding a coastline 17,460 km long. Inland water bodies (excluding fishponds) occupy nearly 0.5 million ha, nearly half of which is swampland, with another 0.2 million ha in lakes. Fishpond area is nearly 0.25 million ha, 94% of which is brackish water. More than four-fifths of the country's provinces and two-thirds of all municipalities border the sea; hence the coastal population accounts for over half (55%) of the total.

**Fisheries and the economy**

Fisheries are an important sector of the economy. Gross Value Added (GVA) in fisheries accounted for 4.2% of GDP in 2003, or 26.5% of GVA in agriculture, inclusive of fisheries and forestry. The fisheries sector has moreover been growing rapidly, hitting a growth rate of 7.4% in 2003, even as agriculture as a whole grew by only 2.8%.

Fisheries are also a major source of agricultural employment. In 2004, fisheries employed 1.4 million persons, equivalent to nearly 12% of agricultural employment or 4.3% of total employment. The industry is a major foreign exchange earner. Exports in 2004 reached US\$ 454 million, accounting for over one-fifth of all agricultural exports. While export growth has been erratic, from 1990 to 2003 fisheries exports expanded by 17% (in nominal US\$). Fisheries trade balance has been positive, in sharp contrast with the rest of agriculture.

**Fisheries and households**

Fisheries are a significant source of food and livelihood. Based on FAO data, in 2003 per capita fish consumption was 28.8 kg/yr, much higher than global per capita consumption of 15.1 kg/yr. Fish accounts for about 38% of animal protein intake. Moreover, fish consumption is particularly important for the poor. The bottom quartile of households obtains 78.0% of animal protein from fish, compared to just 48.1% for the top quartile. Meanwhile fish takes up 53.6% of the food budget for the lowest quartile, but only 34.8% for the highest quartile.

The NSCB has conducted a study of poverty incidence based on populations belonging to households whose heads are primarily employed in one of the basic sectors. In 2003, poverty incidence among fisheries workers was 50.8%; compared to total poverty of 33%, or poverty among farmers at 46.6%. Moreover, except in Regions II and VIII, poverty among fishers is higher than regional poverty; this includes the poorest regions (ARMM, Caraga, and Bicol). Finally regions with high shares of the total fisher population also have very high rates of fisheries poverty.

Aside from actual poverty, fisheries-dependent households are subject to *vulnerability*. First, capture fishery is one of the most hazardous occupations in the world. Fish harvest is also unpredictable, due to local conditions and wider climate change.

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**Fish production systems**

In 2004, total fisheries production reached 3.7 million t. Over the past three decades output has grown by an average of 3.4% per year. Using FAO categories, the largest share continues to be contributed by marine capture (56% in 2004). The smallest share is provided by inland capture (only 3.7% in 2004). Aquaculture, which started out in comparable size as inland capture in the 1970s, grew rapidly to become a major contributor of fish production. It averaged 8.7% growth over the last 30 years, compared to only 2.0% growth for marine capture.

**Status of aquatic resources**

The country's rich natural endowment of aquatic resources is under serious threat. Silvestre et al (2003) compile studies showing that, by the 1990s, demersal marine biomass in major fishing areas had fallen by 65% to 90% of their baseline levels in the 1940s and 1970s. A large part of the stock decline is attributed to overfishing.

In the last four decades, commercial fishery has been growing in terms of tonnage, horsepower, and gear type. In the 1960s, tonnage in large scale marine capture was about 60,000 t, in the 1970s it rose to 97,000 t, though fell back in the 1980s to 76,000 t.

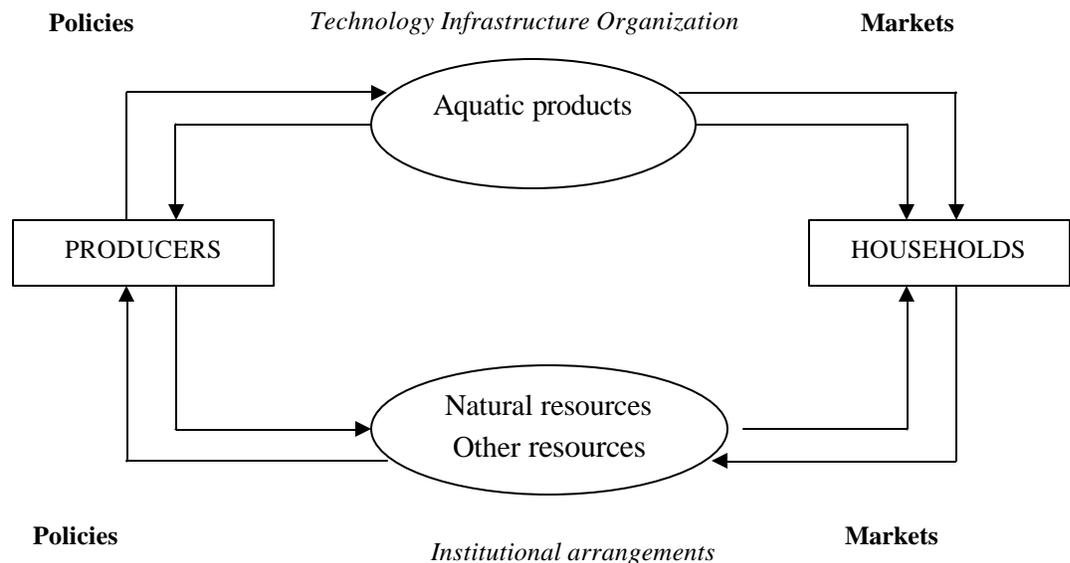
Fishing effort has also been increasing in the municipal fisheries, based on data available for small pelagics up to 1985. Since then, rising employment in fisheries, most of which is in the municipal sub-sector, indicates a continuation of this trend. The increasing effort has failed to produce a proportionate increase in output, implying a decline in catch per unit effort (CPUE). Over the period 1965-1985, CPUE (in t/horsepower/year) fell from 2.5 to 0.84 for small pelagics capture; in demersal capture CPUE fell from 1.13 to 0.42.

Destruction of habitats, sedimentation, pollution and dive tourism impose major threats to aquatic resources. Pollution affects a number of bays, originating from domestic and industrial wastes, agrochemical loading, siltation/sedimentation, toxic wastes and oil pollution. Meanwhile inland fisheries are most seriously threatened by terrestrial activities and competing water uses. As with marine waters, pollution is also a major issue due to large industrial and residential areas around water bodies. Deforestation has been blamed for rapid siltation of many lakes. Aquaculture threatens capture fisheries by denying access to large areas, nutrient loading, introduction of alien species, and other problems.

**2. Current policies and programs for fisheries**

Policies and programs for fisheries have been crafted in light of the problems and opportunities discussed in the previous section. First, we offer a framework for identifying, categorizing, and evaluating interventions towards fisheries development. The framework is based on the circular flow of commodities and values; a simplified schematic is shown below.

**Framework for evaluating fisheries-related policies**



The key actors are producers and households; the latter assumes a dual role of consumer and resource user. Households gain access to natural resources, as well as other production inputs. These are allocated to producers, which combine them to generate aquatic products. These flow back to households as consumption. Resources and products flow within their respective markets; payments represent the opposing flow of value, from consumption expenditures back household incomes.

Several factors impinge upon the resource and value flows. On the upper half of the loop are technology, infrastructure, and organization, which all determine conditions of production and processing, as well as distribution arrangements and logistics along the supply chain. On the bottom half are institutional arrangements, which determine access to resources by households. Hence, two different sets of policies and programs may be delineated: the first relates to the natural resource component of the lower loop, which centers on the creation of institutional arrangements governing access to aquatic resources. The second set relates to other resources along the lower loop, as well as the upper loop; this centers on interventions to promote productivity and value creation along the supply chain.

The framework illuminates the three major criteria motivating the fisheries development strategy. Historically, the dominant criterion has been *short term productivity*, construed in narrow economic terms. The second criterion is *distribution*, which deals with the incidence of economic benefits and costs. The third criterion is *sustainability*, which emphasizes the long term assurance of benefit flows. Policies and programs are typically formulated to address these issues, either singly or in combination.

## Policy Environment

Currently the legislative framework for fisheries is mostly contained in two Republic Acts, the Local Government Code of 1991, and the Fisheries Code of 1998. The Local Government Code places resource management, including coastal and inland fisheries under the jurisdiction of local governments. It also devolves to local governments the provision of aquaculture support services, and the operation of fish ports.

The Fisheries Code reserves aquatic resources in Philippine waters for the sole use of Filipino citizens. Municipal waters are inland waters and marine waters up to 15 km from the shore. Waters up to 10 km from the shore is reserved for municipal fishers; the municipal or city government may however permit small to medium scale commercial fishing in the 10 – 15 km region. The Code also provides for local government units (LGUs) to identify fisher organizations who may gain exclusive use of demarcated areas for capture or mariculture. Meanwhile the Bureau of Fisheries and Aquatic Resources (BFAR) under the Department of Agriculture (DA) regulates marine waters beyond municipal jurisdiction. The Code also sets up Integrated Fisheries and Aquatic Resource Management Councils (IFARMCs) to cover bays, gulfs, and water bodies bounded by two or more municipalities. The IFARMCs address resource management issues spanning across municipalities.

Other laws pertinent to fisheries are the Agriculture and Fisheries Modernization Act (AFMA) of 1997, the National Integrated Protected Areas System Act of 1992, and the Wildlife Resources Conservation Protection Act (RA 9147).

## Fisheries programs and projects

The lead agency for fisheries development is the DA, which assigns fisheries to the BFAR, a line bureau with its own regional offices. The sectoral program is referred to as *Ginintuang Masaganang Ani – Fisheries*, which summarizes the major functions of the BFAR. Program strategies include empowerment and capacity building for LGUs and fisher organizations, promotion of low-cost, high productivity, and ecologically sound technologies, and improvement of the seed delivery and product marketing system. The GMA – Fisheries program includes:

- Conservation and management
- Rural finance in fisheries
- Fisheries production
- Fisheries training and extension services
- Fisheries information and marketing support
- Research development in fisheries
- Fisheries infrastructure

The conservation and management component aims to promote community-based coastal resource management, particularly at the bay level. It also seeks to establish marine protected areas (MPAs) as well strictly enforce fishery laws and regulations.

Productivity and value creation programs begin with efforts to widening access to credit. This would support aquaculture as well as income diversification of marginal fishers away from capture fishery. Meanwhile the fisheries production component aims to expand aquaculture productivity; expand aquaculture area; provide and disperse quality broodstock and fish seed; and increase marine catch from offshore areas on the Pacific side. Training, extension, information, and marketing support all target improved awareness and technology adoption of fishers and fish farmers. Finally, fisheries infrastructure aims to address large post-harvest losses, through provision of regional and municipal fishing ports, cold storage facilities, community-based processing plants, and similar structures.

Another agency whose activities closely relate to fisheries is the Department of Environment and Natural Resources (DENR). The DENR has moved towards mainstreaming coastal resource management through the establishment of the Coastal and Marine Management Office, which coordinates and integrates all coastal management activities at the local level. The DENR also implements foreign-assisted projects on coastal resource management, and also exercises oversight over resource management for Laguna Lake.

Under a decentralization framework, LGUs are encouraged to initiate their own fishery development programs. Some of these are linked with international and local NGOs active in fisheries and sustainable development.

### 3. Assessment and Recommendations

#### Assessment of productivity and value creation programs

Programs for productivity and value creation tend to share the same sets of challenges that confront the whole agricultural sector. On the resource side is the weak asset formation, broadly construed in terms of physical assets and human capital. The former has been attributed to failures in financial markets, while the latter has been attributed to poverty traps and insufficient public sector investments in education, health, and nutrition.

Credit for fisheries is mired in the same set of problems as in the rest of agriculture. Banks are reluctant to lend to smallholders due to transaction costs, risk, and the absence of collateral. The absence of funding credit requirements of agriculture has been blamed on insufficient appropriation from Congress, itself working under a fiscal bind; however distorted policies are also responsible. For example, funds are siphoned off to finance parastatal trading (i.e. the NFA), investment in postharvest facilities, and other expenditures that could have equally been left to the private sector.

Even within agriculture, fisheries suffer from a lopsided allocation. The sector accounts for only a miniscule portion of loans extended by existing agricultural credit programs for small borrowers. This is partly owing to the absence of collateralizable assets for small fishers. The credit and guarantee schemes mandated under the Fisheries Code have gone largely unfunded.

On the production side, a persistent problem is the prevalence of low yields in aquaculture. This has been attributed mainly to insufficient investments in the generation and dissemination of appropriate technologies, interacting with resource constraints. Funding for agricultural research is minute, gauging by the research intensity ratio (percentage of research and extension expenditure in agriculture GVA), which is among the lowest in the Asian region. Within agriculture, fisheries is even more disadvantaged, receiving less than 4% of the total allocation for agriculture and natural resources, far lower than its share in agricultural GVA.

Promotion of commercial fisheries has laudably been limited to offshore waters. However incentives provided for under the Fisheries Code and AFMA have received lukewarm response from the private sector. Offshore fishing is constrained by risk, large investment requirement, and lately, high fuel prices. Information on the location and timing of fish abundance would help lower costs, but such data is largely absent for offshore areas.

In the postharvest stage, studies have noted that wastage is pervasive, owing to insufficient preservation and handling facilities, particularly in fishing ports. Postharvest losses may amount to as much as 40%.

In contrast with traditional processing, modern processing is largely for the export market. A common problem plaguing the modern processing sector is the availability of raw materials. Export requirements, both domestically and abroad, particularly with respect to food safety standards, impose substantial costs on exporters and processors. Compliance typically favors large-scale operations, which already enjoy economies of scale in processing, export logistics, and marketing.

On paper, the restrictions imposed in the Fisheries Code on imports and exports appear quite stringent. However calculations of the effective protection rate (almost identical to the nominal protection rate) arrive at low estimates of protection, around 4.3% in 2004, down slightly from 6.3% in 1999. Tariff protection on fish products are also low; in 2004, rates for fish ranged from 1% to 15%, averaging 6.9%; rates for processed fish were 3% to 15%, averaging 9.8%.

**Recommendations  
for  
productivity  
and value  
creation  
programs**

On the resource side, investments in quality education and the provision of safety nets are needed to improve the state of human resources in fisheries; on this score the sector is no different from the rest of the population. Similarly, the flow of credit to fisheries can be vastly improved if the overall credit constraint facing agriculture can be relieved. This would require far greater outlays for the AMCFP. The expanded AMCFP can absorb the various funds created by the Fisheries Code, but disburse them according to the specified purpose. To include the poor within its ambit, the Program should actively search for ways to extend financially sustainable but uncollateralized credit. These could be through lending via microfinance providers, or the use of collateral substitutes, such as fisheries insurance. The special program for fisheries insurance by the Philippine Crop Insurance Corporation should be seriously studied for possible conversion into a regular program.

The increase in funding for fisheries research should be dramatically increased, commensurate at least to its importance in agriculture. The increase in resources should be channeled to the various commodities and research following a rigorous, stakeholder-led priority setting exercise.

A key bottleneck in many aquaculture commodities is the hatchery system. The availability of quality fish seed is a seriously constraint for the milkfish industry. For milkfish and other key commodities, the role of central hatcheries needs to be actively supported. These central stations should be seen as the linchpin of the fish seed system: the center maintains the breeding nucleus, conducts research, and facilitate the dissemination of hatchery technologies and practices. Ultimately however the task of disseminating quality seed should be performed by privately-owned satellite hatcheries. This “pyramid” system is already being followed, though the dissemination mechanism requires further strengthening, particularly through an expanded role for LGUs.

For the postharvest system, one vital intervention is upgrading the country’s municipal fishing ports. Port development though should be fit within the context of a larger, integrated coastal development plan. In general, no new ports should be built where it will encourage increased fishing pressure on dwindling stocks. There is a clear private sector interest in investing in improved port facilities, if the future returns are really high. However they may be hindered from doing so, because of regulations on port operations and development. There is a strong argument to increased private sector participation in operating and upgrading the country’s port system through lease, build-operate-transfer schemes, and the like. Government cooperation would be needed to ensure quality and availability of critical infrastructure such as power distribution and freshwater supply.

Market policies that continue to maintain an inward-looking stance with respect to foreign trade should be reoriented towards trade liberalization. This would entail lifting the prohibitions provided in the Fisheries Code against imports and the export of live fish and fry, and continued tariff reduction to uniform minimal rates. Allowing the entry of cheap imported fish would lower costs and maintain a reliable flow of raw material for the fish processing and canning industry. It

would also keep domestic fish prices down, benefiting consumers, promoting food security, and protecting domestic fish stocks.

**Assessment of  
natural  
resource  
management in  
the fisheries  
sector**

The epitome of the new institutional arrangements in natural resource management is adoption of community-based, collaborative approaches involving national and local governments, as well as nongovernment organizations and communities. Virtually all such initiatives are found in coastal areas. The most typical elements of community-based coastal management projects are: community organization, establishment of marine protected areas, enforcement of fishery laws, gear restrictions, rehabilitation of aquatic habitats, and livelihood generation. These projects have at times scored tangible successes.

Collaborative approaches do have their share of problems. One that is often cited is weak capacity of LGUs. Lack of human resources or administrative infrastructure is also a major constraint to the widespread replication of co-management approaches. Moreover, LGUs may themselves be “captured”, either by a handful of wealthy fisheries operators, or a vote-rich subset of the fishing community, who may oppose fishery controls. Finally, outright corruption may lead to preferential treatment in the enforcement of rules and regulations.

One oft-cited problem is the failure of program sustainability. Many of these coastal resource management programs are initiated by and end with the flow of foreign donor funds; ideally the program should be continued by domestic partners. Pomeroy and Carlos (1997) note that among 47 community-based projects in 1984-1994, only 9 continued after project completion. Community-based institutions are plagued by transaction costs and free rider problems, which may well undermine durability of these organizations. One estimate places the share of transaction cost in total project cost to be as high as 37%.

At the national level, the fragmentation of services and functions across various agencies and institutions has often been noted. The diversity of tasks and keyactors can be traced to the multiple-use nature of aquatic and related resources, as well as the propensity of government to create new offices to oversee specific functions. Fish is food, hence the involvement of the DA and its emphasis on food security and agricultural production; however fish is one of several coastal and inland water resources, thus involving the functions of the DENR. Marine waters are a mode of transportation and access, hence the involvement of the DOTC. Law enforcement falls under the PNP, while protection of national security is the mandate of the AFP.

Within each agency there are may also be specialization: within DA, aside from the BFAR, the PFDA is in charge of fishing ports; the DENR has the Protected Areas and Wildlife Board (PAWB), the Environment and Management Bureau (EMB) to handle pollution and water quality, the Water Board to assign rights to inland water bodies and groundwater, and the Laguna Lake Development Authority (LLDA) has special jurisdiction over Laguna Lake. The DOTC has the Coast Guard as well as the Maritime Industry Authority. There are also Councils to ensure representative oversight, such as the FARMCs; Agricultural and Fisheries Councils are also organized at the national, provincial, and municipal level. Finally there are the LGUs, mainly the municipalities, who are tasked with the local-level implementation of natural resource management functions.

Clearly this state of affairs is prone to jurisdictional overlaps, duplication of effort, lack of accountability, or outright contradictions in policies and programs. Over time, agency functions and organization have often been adjusted by executive or legislative fiat. The instability weakens institutional memory and capacity, and further exacerbates the confusion of roles. Finally, the policy framework in favor of sustainable fisheries faces a sharp disconnect with implementation on the ground.

Controls of fishing effort to levels consistent with MSY are virtually absent. In commercial capture for example, licenses could be a potent tool towards the reduction of fishing capacity towards sustainable fishery; in practice though there is no link between the issuance of fishing licenses and the state of fish stocks. Moreover, upon issuance of licenses, there is little effort towards monitoring the adherence of licensees with the principles of responsible fishing.

Interestingly this gap is found even for the much-touted co-management schemes. It is fair to say that *there is no clear element of effort reduction in community-based approaches*. One gains the impression that such projects have focused almost exclusively on rehabilitation of reefs and mangroves, combined with MPAs and elimination of illegal fishing, to improve fish stocks. These measures are certainly beneficial, though whether they sufficient is another question.

**Recommendations  
for natural  
resource  
management in  
the fisheries  
sector**

Community-based approaches. Given the successes shown by the collaborative approach to coastal resource management, it is natural to recommend expanding such programs, improving their quality, and sustaining their operations. Community participation is a key ingredient in program success. Hence community organizing should be a prerequisite in all such programs, for which the services of credible NGOs should be actively tapped.

Sustainability concerns should be factored into program design; for example, coastal management projects may require the local share in the program work to be increasing over time – in effect implementing a gradual withdrawal strategy for the external agency. Promotion of localized resource mobilization may conflict with the goal of expanding coverage of these programs. However it should be recognized that community-based, collaborative programs are complex and inherently difficult to implement. They are far from a panacea in fishery management; in some cases, other approaches (heavier on command-and-control) may be appropriate.

Community-based management has done fairly well in resource rehabilitation and MPAs. With the prodding of LGUs and the national government, they should begin to take on a task they have hitherto avoided – the reduction of fishing effort. A crucial ingredient of such a step would be to *incentivize* the removal of effort, rather than rely entirely on coercion. Resources should be made available to encourage some of the fishers to exit permanently. These would likely include new entrants, or part-timers who employ fisheries as an alternative livelihood. Since households with occupational flexibility may find it easy to re-enter, the provision of territorial use rights for a community organization is essential to sustaining the gains from effort reduction. These rights should be made conditional on the organization enforcing fishery rules and catch limits.

Devolution. The promotion of grassroots democracy has admittedly produced mixed results; however the improvement of governance in selected localities is encouraging. Rather than reversing devolution, the policy thrust should be to strengthen devolution by filling up capacity gaps of LGUs. This prescription is tied up with addressing the overall constraints faced by LGUs, such as inadequacy of the Internal Revenue Allotment, weakness in local resource mobilization, and the absence of trained professionals. For fisheries in particular, one area in which national government assistance would be welcome, and perhaps essential, would be the creation and strengthening of IFARMCs to promote fishery management at the unit of an ecosystem.

The missing element of fisheries controls in many community-based approaches can only filled with the support of the LGU. In turn, LGUs can only initiate this process by bringing in municipal fishers into the formal sector, where they can be regulated. In short, LGUs should de-legitimize the prevailing *status quo* of unlicensed municipal fishing. A clear incentive for them to do so would be the additional revenue to be generated by the license fees; the disincentive would of course be political resistance.

National policy framework. The confusion caused by fragmented natural resource management functions in the bureaucracy needs to be immediately addressed by a comprehensive rationalization. The management of open access or common pool resources falls under the DENR; in contrast, the DA, given its production-orientation agency, is probably not the best agency to promote protection of fishery resources. The logic of this assessment suggests that the fishery resource management functions of the DA, be moved to the DENR. The recommendation does not extend to all the functions of the BFAR; credit, aquaculture and postharvest programs should remain lodged in the DA.

Rationalization includes making clear the lines of authority and enforcement. Mechanisms should be available for BFAR to receive and act upon complaints from municipalities about the

encroachment of commercial fishers on their waters. Areas of recurring conflict and overlap should be dealt with by the issuance of the appropriate guidelines agreed upon by the major stakeholders.

For fisheries management, the national government should model the implementation of catch limits and the recovery of resource rents. The catch limits should be set and adjusted over time to achieve MSY, for major fish stocks. This assumes a comprehensive system of stock assessment and monitoring.

A rights-based approach to the implementation of catch limits should be explored. In some countries, a system of Individual Transferable Quotas (ITQs) has been successful. However there is only one such example from a developing country. It may be worthwhile exploring this scheme for similar targeted fisheries, such as the large pelagics. For multi-species and small-scale fisheries, ITQs may not be feasible. Here we return to our previous argument, that community-based approaches may be the key ingredient towards implementing catch limits for these fisheries, based on territorial use rights and the provision of incentives to exit from fishing.

What is envisioned in this recommendation is no less than a well-funded, nationwide program of effort reduction. Incentives, conditional on permanent exit from a fishery, would take the form of livelihood assistance. Clearly such an effort would require a broad, inter-agency, multi-stakeholder approach. It would include financial institutions, microfinance providers, the DA, the DENR, even the DOLE, as well as the LGUs. If the exit incentives lead to permanent effort reduction, the initial investments would make perfect economic sense in view of the enormous prospective rents to be recovered from capture fisheries.

**4.**  
**Concluding**  
**remarks**

This paper highlights two striking paradoxes of the fisheries sector. The first is the paradox of poverty: despite the tremendous economic progress of the sector, most fishery-dependent households remain destitute. This attests to both the inequitable distribution of economic benefits as well as the massive population pressures bearing down on the sector. The second is the paradox of productivity: in both capture fisheries and aquaculture, large increases in production conceal a deteriorating resource base, dissipating resource rents and threatening the collapse of fish stocks.

These problems are well-recognized, and policy has been formulated in response. Many of the policy reforms have scored noteworthy successes, enough to put the country on the map as a policy pioneer among developing countries. It is equally recognized though that much more needs to be accomplished. Large gaps in implementation remain, and the policy inertia can be frustrating. The inertia is due less to ignorance, and more to the difficult options that are confronted: one is to maintain the *status quo* and its attendant paradoxes; the other is to inflict short term costs, and force the dislocation of some sub-sectors in fisheries, in order to win long term gains that benefit society at large. These very benefits are the key to hammering out a consensus for reform among the diverse and competing stakeholders.

The peculiar brand of Philippine democracy, with its tense balance between contending groups and interests, is mainly responsible for the policy gridlock. However within that same democratic framework lies the hope for breaking the impasse. It is hoped that this paper would add to the growing list of policy studies that would inform and support a constituency for change.



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