

Aquaculture for Rural Development (ARD) in the Philippines: Privatization vs. Community Property Rights

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Abstract

In the Philippines, a *de facto* open-access situation in fisheries persists despite progressive fishery laws in recent years that allocate use of coastal and inland areas between artisanal fishers on the one hand, and commercial capture fishers and aquaculture operators on the other hand. Weak state institutions and lax implementation of laws have gone hand in hand with a threefold increase in the last twenty years in the population of artisanal fishers eking out subsistence from badly degraded fishery resources and coastal ecosystems.

Advocates and practitioners of community-based coastal resources management (CBCRM) in the country have pushed for the adoption of community property rights (CPR) systems that would address open access, bring cost and benefit decisions together, foster sustainable resource use and mitigate socioeconomic inequities in coastal communities.

However, a cause for concern is the gathering momentum in the implementation of the Aquaculture for Rural Development (ARD) program of the government. There has been widespread criticism to this approach among artisanal fishers, which they see as a reprise of shrimp aquaculture expansion that resulted in the clear cutting of mangrove forests from the 1960s to the mid 1990s.

The ARD program is likely to result in more negative externalities, heightened conflict over coastal resources, and increased income disparity and poverty for artisanal fishers and coastal communities. It will induce the entry of opportunistic “investors” interested in short-term financial gains but not in the sustainable utilization of resources over the long term. Thus, it is a looming threat to community property rights regimes that are still in the early stages of development by local fisherfolk organizations and their allied institutions.

In achieving community property rights, it is envisioned that negative externalities will be minimized or eliminated altogether, and the continuity of benefit streams (to the community and society as a whole) ensured in the long run. This framework can be effectively employed in countering trends towards privatization of coastal resources that is likely to accompany the implementation of the ARD program being bruted by the national government.

Amid projections of a slowdown of production growth in capture fisheries, government is putting priority on the establishment of marine aquaculture parks, initially in selected sites across the country but eventually on a widespread basis. Most, if not all, of these areas are within municipal waters and conflict between mariculture operators and municipal capture fishers is expected.

To ensure sustainable and equitable management of fisheries and coastal resources, including both capture and culture activities in nearshore waters, municipal fisherfolk should effectively hold preferential use rights to these areas to which they are entitled based on existing laws. Further, any development leading towards the expansion of marine aquaculture must be within the context of comprehensive coastal resource management plans (RMPs), which would include limits to the extent of these areas, zonation of municipal waters, internalization of environmental costs to be borne by mariculture operators, support services for fisherfolk cooperatives engaged in aquaculture and measures such as environmental bonds to operationalize the precautionary principle.

Open-access in capture fisheries

A de facto open-access exists because of the non-enforcement of such laws, which results in the actual absence of management and regulation on the use of coastal and marine resources. De facto open-access exists when government institutions fail to exercise their authority over fishery resources to ensure sustainable utilization.

Fishing activities that are illegal, unregulated and unreported (IUU) are still widespread in the coastal and marine waters of the Philippines due to the inability of government institutions to implement regulatory measures.

The Philippine Fisheries Code contains policies relevant to effective management. One of these pertain to the allocation of 15 kilometers from the shoreline to municipal fishers (i.e. those with fishing boats weighing three gross tons and below), reinforced by Fisheries Administrative Orders prohibiting any active gears within the zone. But the real intention of the law was not realized. Municipal fishers, who often use traditional fishing methods and engage in generally subsistence fishing, loosely correspond to the term “artisanal” fishers.

Municipal fishers may have preferential use rights on the 15-kilometer extent from the shoreline based on the Philippine Fisheries Code, but because small-scale and medium-scale commercial fishers (i.e. those with fishing boats weighing from over three to 25 gross tons) have no capacity to exploit the high seas, they catch fish within the 15-kilometer zone called municipal waters and outdo the municipal fishers. Species caught by both municipal and commercial fisheries tend to show that the two sub-sectors directly compete with each other, with commercial fisheries getting two thirds of the fish catch.¹

Unprepared local government units and the neglect of national government are seen as among the major causes of the failure of law enforcement. Moreover, the guidelines for the mapping of the 15-kilometer extent of the municipal waters based on the archipelagic principle was revoked and replaced with a watered down version.

Threefold increase in coastal population

Unregulated access has led to overexploitation of resources; this in effect has exacerbated the already bad condition of an increasing number of municipal fishers in the country.

As per results of the 2002 census of the National Statistics Office, the total number of fishing operators in the country had increased by threefold since 1980. From the 584,000 fishing operators recorded in 1980, the figure rose to 1.8 million in 2002. Of the 1.8 million, 1.78 million, or 99 percent, are municipal fishing operators and the rest are into commercial fishing operations.²

Actually, the number of people dependent on municipal fishing could reach 2.9 million in 2002 based on the NSO survey. This is because besides the 1.781 municipal fishing operators, 1.1 million household members (of the fishing operators) also engaged in fishing.³

But despite the threefold increase in the number of fishers, municipal fisheries production has remained stagnant since 1980, hovering between 700,000 and 900,000 metric tons per year.⁴ In effect, a municipal fisher today is getting only a third of his catch in 1980.

Indeed, this is a clear indication that the country's open-access fishing grounds have now been fished to their maximum level and can no longer produce more despite the growing number of fishers and a corresponding escalation of fishing effort over the past 22 years. It means that the increasing fishing effort is no longer sustainable but causing over-fishing.

Loss of mangrove forests due to aquaculture

The degradation of coastal resources has been aggravated by aquaculture operations. In the last 40 years or so, mangrove areas have been one of the most severely affected resources by conversions mainly to aquaculture purposes. From a total of 450,000-500,000 hectares in 1918, the extent of mangrove forests was down to 117,700 hectares by the late 1990s, of which 95 percent are secondary growth.⁵

Mangrove conversion to fishponds for milkfish and shrimp, which began in the 1960s and continued up to the 1990s, had been one of the leading causes of mangrove decline. This is supported by data showing the extent of brackish water fishponds that were carved out of mangrove areas. According to Jurgenne Primavera, a leading expert on mangrove ecosystems, the dominant aquaculture system in the Philippines consists of brackish water fishponds totaling 240,000 hectares, while freshwater ponds are only around 15,000 hectares.⁶

As will be seen below, mangrove conversions to aquaculture had been supported by government policies that made a priority of fisheries production and the export of high-value fishery products such as shrimp. These policies, of course, were not yet informed by fairly recent findings about the socio-economic and environmental benefits of mangrove ecosystems.

Socio-environmental costs of intensive shrimp aquaculture

Since the second half of the 1980s, foreign financial institutions such as the Asian Development Bank and World Bank became major promoters of intensive farming of shrimp, carp and tilapia in Latin American and Asian countries, offering hundreds of millions of dollars in loans to aquaculture development. Aquaculture was hyped as the solution to falling wild-fish production and global hunger.⁷

As a result, intensive aquaculture, especially shrimp farming, received ample government support in these countries. In the Philippines, shrimp farming was a priority area of investment in the 1980s and 1990s and investors were given fiscal and non-fiscal incentives like tax holidays and tariff exemptions in the import of feeds and equipment.⁸

But the costs of intensive shrimp farming have been particularly severe on the mangrove ecosystems and the coastal communities where the brackish-water shrimp farms are found. Besides the loss of mangroves, it has caused increased salinity of drinking water as a result of seepage of saltwater from shrimp farms into underground aquifers. In the town of Dilasag, Aurora, for example, the shallow wells of a village turned out increasingly salty water and the residents had to go to the town proper to fetch their drinking water, for which they had to spend more than US\$ 1 weekly in transportation.⁹

A recent study of the health impacts of intensive shrimp farming in Bohol Island has linked the relatively high incidence of diarrhea, intestinal parasites and skin diseases in local children to the effluent released into the river where local people fish and bathe.¹⁰

Indeed, the improper disposal of sludge and effluent containing carcinogenic antibiotics, metabolic wastes and organic matter into adjacent water ecosystems has caused water pollution that kill many wild-fish species.¹¹

Perhaps most damaging is the dislocation and marginalization of local small-scale producers due to the “virtual privatization” of coastal areas that are regarded as common land resources. Leasehold terms of up to 50 years¹² to shrimp farm operators have practically taken away the traditional use rights of local communities to the mangrove resources.

Policies on mangrove areas

The Department of Agriculture (DA) and Department of Environment and Natural Resources (DENR) are the primary agencies tasked to look over the concerns and sustainability of the country's coastal resources.

The main responsibility of DENR is the full exploration and development as well as judicious management, renewal and conservation of the country's natural resources. The DA on the other hand, has the primary task of promoting the well being of fishers and accelerating the development of fisheries as provided for in the Administrative Code of 1987.¹³

The continuing poor status of mangrove areas is primarily caused by the inability of the government to fully implement current laws and regulations. But another reason is that up to the 1980s, the importance of mangrove resources was not fully appreciated by the government. Mangroves were regarded as nothing more than a source of firewood and construction materials.¹⁴

Under the old Forestry Code (Presidential Decree 705), mangroves and other swamps not needed for shore protection and suitable for fishpond purposes were released to and placed under the jurisdiction and management of the DA's Bureau of Fisheries and Aquatic Resources (BFAR).

The DA and BFAR formulated the Fishpond Lease Agreement (FLA), by means of which the leasing of fishpond areas was allowed to provide economic opportunities for local aquaculture investors. The FLA terms remain very liberal: a fishpond operator can lease a fishpond for up to 50 years, something which can be regarded as virtual privatization.

It was not until 1991 that mangrove cuttings and conversions were banned through the issuance of the Revised Forestry Code (Republic Act 7161). This was followed by the issuance of the Fisheries Code in 1998 that prohibited all mangrove conversions.

No doubt the policy shift against mangrove conversions in the 1990s was a result of a new awareness of the importance of mangrove resources. Mangroves were now regarded as not only ecologically but also economically important. A hectare of mangroves do not only protect shorelines, they also provide an estimated economic equivalent of Philippine peso (Php) 22,800 yearly in wood and fishery products. There are resource valuations showing that for every hectare of mangrove forest destroyed, up to one ton of fish is lost every year.¹⁵

Below is a table on the specific policies governing the use and management of mangrove resources in the country:¹⁶

Date	Policy	Remarks
1970s	PD 704: Fisheries Code of 1974 PD 705: Forestry Code of the Philippines	<ul style="list-style-type: none"> • Mangroves and other swamps not needed for shore protection and suitable for fishpond purposes were released to, and placed under the jurisdiction and management of BFAR.
1982	Ministry of Natural Resources Administrative Order entitled, Mangrove Forest Resources Management and Utilization Regulations.	<ul style="list-style-type: none"> • Conversion of mangrove areas besides proclaimed mangrove forest reserves and wilderness areas into aquaculture ponds. • Unutilized mangroves and swamplands released to BFAR for fishpond purposes, which were abandoned for five years from the date of release, shall automatically be reverted to the category of forestland.
1990	DENR Administrative Order No. 15 entitled, Regulations Governing the Development and Management of Mangrove Resources.	<ul style="list-style-type: none"> • Granting and/or renewal of mangrove timber license and/or permit of any kind that authorizes the cutting and/or debarking of mangroves for special purposes in areas outside the coverage of FLA and mangrove plantations shall no longer be allowed. • Conversion of thickly vegetated mangrove areas into fishponds shall be prohibited • Fishpond development shall only be allowed in denuded areas, which have been zonified as suited for each activity.

Date	Policy	Remarks
1991	Joint DA-DENR General Memorandum Order No.3	<ul style="list-style-type: none"> ▪ Focuses on the Guidelines on the Implementation of Section 24, par. 2&3 of PD 704 as amended, with Section 43, par.3 of PD 705 as amended. ▪ No applications shall be acted for fishpond lease over forestlands, which have not been released for fishpond development by the DENR. ▪ Fishpond areas, which are not covered by fishpond lease applications within 5 years from the release thereof to DA and BFAR, shall revert automatically to the administration of DENR. ▪ Areas released and covered by FLA applications and found out to be vegetated or have been vegetated with mangrove species, but is undeveloped or unsuitable for fishpond purposes, shall be excluded from the application and reverted to the administration of DENR. ▪ Creation of a DA-DENR team for the implementation of this order and the establishment of a joint database and monitoring system.

Despite the policy shift to mangrove protection, illegal conversions persist at an estimated rate of 1,000 hectares of mangrove forest per year.¹⁷ Factors in the inability to implement current laws prohibiting mangrove conversions are the highly centralized management in both DA and DENR and the lack of participation of local government units (LGU). As a result, the two departments have failed to collaborate and coordinate their efforts in implementing the laws and regulations on the use of mangrove areas, including the policies on issuing FLA and abandoned fishponds.¹⁸

Moreover, the lack of government financial and logistical support for mangrove stewardship programs called Community-Based Forest Management Agreements (CBFMA) is mentioned by community organizations that are CBFMA awardees.

The experience in CBCRM and CPR

Community-based coastal resource management is one approach to sustaining coastal resources that has proven to be effective. It developed in the late 1970s as an alternative to government-implemented coastal resource management that failed because it did not involve the local municipal fishers and other users of the coastal area or zone.

The significance of CBCRM is that the local resource users themselves (who are the primary stakeholders) are organized and trained to plan and implement fishery regulations and assess their impact collectively. They are taught to fish within the sustainable limit of the coastal fishing ground and to protect the area from the fishing expeditions of commercial fishers and others who are not certified users of the fishing ground.

This principle of exclusion, especially of non-local fishers, is based on sustainability values and requires effective control of the fishing ground by the community as a necessary condition. The term community in this sense represents the pool of resource users and other local stakeholders that are able to collectively and effectively manage the coastal fishing ground.

In the Philippine setting, community control of the coastal fishing ground is formally recognized as the municipal fishers' "preferential use rights" in the 15-kilometer municipal waters (or coastal zone) as defined in the Fisheries Code. However, experience has shown that such rights are effectively wielded only by strong fisherfolk organizations that have succeeded in establishing co-management arrangements with the local municipal governments.

Co-management arrangements as they currently exist contain elements of community property rights or CPR. These are a more or less defined system of use rights with varying levels of exclusivity and the presence of a management body representing the authority of the community that effectively implements the resource management plan.

There are several examples of effective co-management in the Philippines, one of which can be found in the town of Badian, Cebu. There the local fishers have organized themselves into the Zaragosa-Badian Island Multi-Purpose Cooperative that implements fishery resource management together with livelihood projects.¹⁹

This Coop has set up a marine protected area in the local fishing ground and engaged in mangrove reforestation with the help of the municipal government. The Coop leaders have advocated to the town officials the increase in government support to fishery law enforcement, from the current five percent to 10 percent of the yearly budgetary allocation. The leaders are also key members of the government-formed Municipal Fisheries and Aquatic Resource Management Council (FARMC), which now functions as the co-management body.

In the FARMC, the Coop members and other stakeholders have formed patrol teams that guard the local fishing ground from fishing sorties by commercial fishers. The FARMC is also active in the resolution of resource-use conflicts through dialogue.

The Coop has led in the conduct of fish catch monitoring to periodically assess variations in the volume of fish catch and the size of different species of fish. Through this method and in the course of several years, the local fishers have been able to determine how to maintain the growth of local fish stocks and what appropriate, sustainable gears to use.

A clear example of how the local fishers was able to assert their control over the fishing ground was when they stopped the operation of an intensive fish cage owned by a Taiwanese

businessmen, which emitted pollutants besides preventing the fishers' access to part of the fishing ground. This they did through painstaking lobbying and public education which bore fruit when the municipal government and the local community agreed to unite against the continued operation of the fish cage.

Despite the gains, however, much remains to be done in advancing CBCRM and CPR as the alternative to the open-access regime and the virtual privatization of coastal areas in the country.

For one, preferential use rights have not been translated to anywhere near the level of community property ownership of the fishing ground. Legally, the municipal government can still allow commercial fishing within defined portions of the 15-kilometer municipal waters although it cannot do so without consulting the local fishers.

While tenure instruments with CPR characteristics already exist in marine protected areas and community-based forest management agreements (mangrove stewardship), the lack of government support has impacted negatively on the fishers' efforts to sustain resource management initiatives and to develop resource-based enterprises aimed at realizing the potential economic benefits of these tenure instruments.

Indeed, there is a need to link efforts by municipal fishers to advance CBCRM and CPR with market initiatives on their own as part of a comprehensive strategy for poverty alleviation in coastal communities and the development of municipal fisheries.

At the same time, municipal fishers must be able to overcome the continuing threat of investment liberalization in coastal areas, especially in aquaculture.

Aquaculture for Rural Development (ARD)

The ARD program is supposed to be the fruit of government's attempt to depart from past aquaculture programs that did not take into account the socio-environmental costs of intensive aquaculture.

Representatives of various sectors were supposedly involved in the drafting of the policy and program guidelines that inform the ARD program. These included representatives from the business sector, non-government organizations, academic institutions and government agencies.²⁰

BFAR claims that ARD is a departure from the old production-oriented and technology-based paradigm, thus shifting from "aquaculture development" to "aquaculture for rural development". As such, it is supposed to have the following features:²¹

- Community-based
- Simple, environment-friendly technologies
- Low capital investment
- Market-focused

The ARD program consists of the following seven components (or systems) that are now promoted and implemented in selected areas all over the country:²²

1. Rice-shrimp culture, a shift from rice-fish to rice-*ulang* culture (*ulang* is the local name for giant freshwater shrimp [*Macrobrachium rosenbergii*]);
2. Conversion into productive aquaculture areas of so-called “wastelands”, such as sand dunes, lahar-covered areas, sunken or flooded areas, marshland and swamp land;
3. Village-level aquarium industry development, i.e. ornamental fish production as “backyard” livelihood or income-generating project for the fisherfolk;
4. Culture of fish in tanks as part of urban aquaculture;
5. Fish apartelle or 14 Condo Model, another modern aquaculture technology designed for urban aquaculture promoting the culture and propagation of local indigenous and exotic species such as *hito* (catfish), *ulang*, *dalag* and tilapia
6. Fish dispersal in communal waters;
7. Establishment of mariculture parks or marine cages patterned after the concept of industrial parks;
8. Establishment of Seaweed Village Ecozone, to be implemented in seaweed producing regions;
9. Saline-tolerant tilapia culture, aimed to augment production of underutilized fishponds.

Infirmities of ARD

Despite BFAR’s trumpeting that ARD is community-based and aims at rural development, the program has been criticized for falling short of its promise. Below is a table showing the pros and cons of the program as seen by fisherfolk representatives and other stakeholders:²³

Component	Pros	Cons
1. Rice- <i>ulang</i> culture	<ul style="list-style-type: none"> • Technology is available 	<ul style="list-style-type: none"> • No established market • Not many areas in the country have a sufficient stocks of <i>ulang</i>
2. Conversion of wastelands		<ul style="list-style-type: none"> • No clear definition of “wastelands” • Threat to remaining mangrove areas • Threat to the use rights or tenure of coastal communities
3. Village-level aquarium industry development	<ul style="list-style-type: none"> • Potential market 	<ul style="list-style-type: none"> • No in-depth study on how to attain the industry’s potential for development
4. Culture of fish in tanks		<ul style="list-style-type: none"> • Capital-intensive, entails entrepreneurship and technical skills
5. Fish dispersal in communal waters		<ul style="list-style-type: none"> • Danger of becoming a mere dole-out mechanism • Majority of dispersal efforts are politically motivated
6. Mariculture park		<ul style="list-style-type: none"> • Pollution of coastal waters • Environmental laws ignored for expediency • No scientific basis on the extent of sustainable production • Threat to use rights and tenure of coastal communities • No social preparation for small fisher-beneficiaries • Requires high public infrastructure cost • Threat of market glut
7. Seaweeds village eco-zone	<ul style="list-style-type: none"> • Potential for community-based aquaculture production • Low capitalization • Simple culture technology 	<ul style="list-style-type: none"> • Lacks government support to small producers in production, post harvest, marketing and processing

As far as these stakeholders are concerned, ARD has not actually departed from past aquaculture programs that served the interests of the business sector instead of the community. The various fiscal and non-fiscal incentives continue to be given to aquaculture operators engaging in the culture of high-value fishery products such as shrimp. These are the medium-scale and large-scale aquaculture operators who can afford the cost of intensive aquaculture.²⁴

As in the past, municipal fishers and coastal communities were not involved in developing the ARD program despite the fact that they have borne the socio-environmental costs (also called “market externalities”) of aquaculture programs since the 1960s.²⁵

The stakeholders also question the validity of the classification of swampland and marshlands as “wastelands” and the cost-effectiveness of converting sand dunes into “productive aquaculture areas”.²⁶

The case of mariculture parks

In 2005, BFAR established 18 mariculture areas in different regions nationwide. Of these, ten are already operational which can be found in Guimaras, Samal Island, La Union, Western Samar, Leyte and Southern Leyte. Other provinces where mariculture parks are being developed are Zambales, Bataan, Occidental Mindoro, Palawan and Camarines Sur.²⁷

In the mariculture parks, *bangus* (milkfish) and other high-value aquatic products such as *lapu-lapu*, sea bass, rabbit fishes, abalone and sea cucumber are intensively grown in fish cages.²⁸

Far from benefiting them, municipal fishers regard mariculture parks as a threat to their preferential use rights. In Zambales, many of the fish cages are illegally built because they extend beyond the allocated area for the park, resulting in local fishers’ loss of access to parts of the fishing ground and a lower fish catch. Not surprisingly, local fishers are demanding the removal of the fish cages.

In fact, the establishment of mariculture parks goes against the Fisheries Code prohibition on the installation of structures such as fish cages in municipal waters, as well as the issuance of licenses or permits to operate such structures if the operator is not a fisherfolk organization.

But in practice, mariculture parks have been installed and operated not by fisherfolk organizations but by businessmen. This is because municipal fishers cannot afford the high cost of intensive fish cage operation, which industry insiders say is about Php 1 million per production season.

Besides, the development of sustainable aquaculture practices is not given the urgency it deserves. Therefore, there is the danger that unsustainable stocking and feeding practices will be repeated in the new mariculture parks, such as the ones that caused water pollution and triggered several incidents of fish kill (sudden and widespread fish mortality) in Pangasinan and other areas.

The case of Pacific white shrimp

The government is bent on introducing the exotic Pacific white shrimp (*Peneaus vannamei*) in the country as a “better” alternative to *sugpo* (*Peneaus monodon*), the native prawn. It hopes that *P. vannamei*, which is supposedly sturdier and less costly to culture than *sugpo*, will provide a fresh impetus to the sluggish local shrimp industry.

But in a situation where local aquaculture operators continue to disregard sustainable aquaculture practices, the commercial culture of *P. vannamei* runs the risk of repeating the massive socio-environmental impacts of intensive shrimp farming.

The culture of *P. vannamei* would provide an incentive to continue illegal mangrove conversions in spite of the existing total ban. As mentioned above, remaining mangrove forests cover 117,000 hectares or only a fourth of the total mangrove area in 1918. Other impacts of intensive shrimp farming could happen all over again.

There is also the danger of perpetuating the current leasehold terms of up to 50 years to fishpond operators, which has caused the dislocation of municipal fishers from their traditional fishing grounds since the 1960s.

On the other hand, the dollar profits from shrimp exports are not likely to trickle down to the coastal communities, just as they have not since the 1980s. Employment of locals in intensive shrimp farms is limited to unskilled, low paying jobs in pond construction, maintenance and harvesting. Technical and managerial positions are usually reserved for outsiders trusted by the shrimp-farm owner. The short lifespan of intensive shrimp farms and the consequent shifting of operations prevent stable employment conditions.²⁹

Towards a community-based and sustainable aquaculture

At present, the number of municipal fishers continues to grow in spite of increasingly depleted coastal resources and in the midst of a persistent open-access regime. Now aquaculture has been primarily responsible, together with commercial fisheries, for causing massive “market externalities” that have had a disastrous overall impact on wild-fish productivity in the last several decades.

Increasingly marginalized and having little economic options besides fishing, municipal fishers are now faced as never before with an ever-decreasing fish catch and worsening poverty if urgent reforms are not made in the existing property regime in Philippine coastal fisheries.

This situation calls for an alternative paradigm of a community-based and sustainable aquaculture. In general, this paradigm protects and advances the tenure rights of the community (of municipal fishers) to the coastal resources towards CPR. It goes without saying that it also promotes the sustainable use of the resource base.

The following table contains some of the characteristics of a community-based and sustainable aquaculture (acceptable aquaculture systems), as well as certain contrary characteristics (objectionable aquaculture systems).³⁰

Aquaculture systems for promotion	Acceptable aquaculture systems	Objectionable aquaculture systems
Small-scale grouper cage culture, provided these are regulated	Crop rotation/ polyculture, e.g. shrimp, fin fishes	Intensive shrimp farming that impact on mangrove resources/marine environment and capture fisheries
Community-based seaweed farming, culture of filter feeders (oysters, mussels, <i>capiz</i> shell, etc.), provided these are regulated and have support services (e.g. market, credit, processing)	Tilapia, milkfish, carp and other omnivorous species that contribute to food security, provided these are regulated	Intensive fish pens and fish cage culture with social and environmental impacts
		Current FLA system (virtual ownership, arbitrary lease fees that do not properly reflect economic and resource rents)
		Arbitrary rent/license fees for aquaculture projects besides those covered by FLA (e.g. mariculture fish pens and cages)
		Aquaculture practices that go beyond carrying capacity limits and are unregulated
		Large-scale groupers and other carnivorous species that require a lot of trash fish as feeds

In pursuit of such a paradigm, the government needs to adopt the following specific reform measures:³¹

One is the payment of an environmental bond by aquaculture operators. The amount of the “environmental bond” should approximate the estimated value of the coastal resources to be adversely affected by a specific type of aquaculture operation.

Another measure is the reduction of the Fishpond Lease Agreement (FLA) from 25 to just 15 years, renewable for another 15 years instead of the present 25 years, and subject to assessment every five years based on production capability and compliance with lease conditions.

Third, the size of a fishpond must be reduced from the current maximum of 50 hectares to just 15 hectares to avoid parts of these being abandoned or undeveloped by leaseholders, which is presently the case in 60 percent of areas covered by FLA.

Fourth, abandoned or cancelled FLA-areas, particularly those that are partially developed but cannot be reverted to their original mangrove state, should be awarded to fisherfolk Cooperatives under favorable terms of tenure. The Philippine Central Bank, through the government lending institutions, should accept FLA as loan collateral to help municipal fishers and their families who want to invest in aquaculture.

On a national scale, there is a need to delimit the coverage of aquaculture operations according to suitability of areas to aquaculture. A law should be enacted by Congress that would provide an overall plan for the mapping, management, development and conservation of the identified suitable areas for aquaculture.

Reforms in the government bureaucracy are also necessary to ensure effective regulation of aquaculture operations. On the issuance of licenses and permits, for instance, there is a need to streamline the present process, which involves contradictory tasks among three government entities: the Department of Agriculture, Department of Environment and Natural Resources and the local government units.

A stop-shop coordinating mechanism among these entities is required to rationalize the task of licensing, monitoring and evaluation of aquaculture operations. However, most management functions should be devolved to the local government units, provided that local community stakeholders, such as municipal fishers, are included as key participants in decision-making regarding the use and management of aquaculture farms and foreshore lands.

¹ Food and Agriculture Organization of the United Nations, "Philippine Fishery Country Profile," November 2005. <http://www.fao.org/fi/fcp/en/PHL/profile.htm>

² National Statistics Office, "2002 Census of Fisheries," Census results posted at the website of National Statistics Office, April 2005. <http://www.census.gov.ph/data/pressrelease/2004/pr0431tx.html>

³ Ibid.

⁴ BFAR & BAS Data on Marine Fishery Production (1980-2002), cited in Raymundo P. Addun, "Estimated Impacts of Free Trade in Open-Access Marine Fisheries of the Philippines," *Lundayan Journal*, special issue (2005): 30.

⁵ Dioscoro M. Melena, Emma E. Melena, and Amuerfino M. Mapalo, "Mangrove Management and Development in the Philippines," paper presented at the Meeting on Mangrove and Aquaculture Management, Kasetsart University Campus, Bangkok, Thailand, 14-16 February 2000, pp. 1-2. www.oneocean.org/download/20000427/mangrove_management_phils.pdf

⁶ Tambuyog Development Center, "NFR Issue Paper on Aquaculture," Quezon City, 2002. p.1. (Typewritten.)

⁷ Amoreena Velasco, Shrimp Aquaculture and Trade Issues in the Philippines, Lundayan Monograph Research Study Series, no. 2 (Quezon City: Tambuyog Development Center, 2003), p. 9.

⁸ *Ibid.*, p. 10.

⁹ *Ibid.*, p. 22.

¹⁰ Giselle PB. Samonte-Tan, "Impact of Shrimp Aquaculture on Health, Food Security and the Environment in Bohol Province," paper submitted to the Participatory Research, Organization of Communities and Education towards Struggle for Self-Reliance (PROCESS-Bohol), Bohol Province, 16 June 2005, pp. 41-42.

¹¹ Velasco, p. 22.

¹² Fisheries Resource Management Project & Bureau of Fisheries and Aquatic Resources (FRMP-BFAR), Implementing Rules and Regulations Pursuant to Republic Act 8435: The Agriculture and Fisheries Modernization Act of 1997 and Republic Act 8550: The Fisheries Code of 1998 (Quezon City: FRMP-BFAR, 2000), p. 199.

¹³ Florendo Barangan, "FLA Policies and Institutional Arrangements," paper presented at the Policy Discussion on the Current State of Philippine Aquaculture IV: Fishpond Lease Agreements," Conference Room, Bureau of Fisheries and Aquatic Resources, Quezon City, 4 December 2002, pp. 2-4.

¹⁴ *Ibid.*

¹⁵ *Ibid.*

¹⁶ *Ibid.*

¹⁷ The Philippine Star, "Small fishermen buck commercialization of Pacific white shrimp," 23 October 2005, p. B 2.

¹⁸ Barangan, pp. 2-4.

¹⁹ This fisherfolk Cooperative in the town Badian has been a partner of Tambuyog Development Center in implementing the CBCRM program in the locality.

²⁰ Tambuyog, pp. 2-4.

²¹ *Ibid.*

²² *Ibid.*

²³ *Ibid.*

²⁴ Tambuyog, p. 4.

²⁵ *Ibid.*

²⁶ *Ibid.*

²⁷ The Philippine Star, "18 mariculture parks established so far," 29 May 2005, p. B5.

²⁸ *Ibid.*

²⁹ Gilbert Sepulveda, "Philippines: Fluctuations of a Fever," in The Blues of a Revolution, ed. Isabel de la Torre and David Barnhizer (Seattle: Industrial Shrimp Action Network & Asia-Pacific Environmental Exchange, 2003), pp. 95, 195.

³⁰Tambuyog, p. 11.

³¹ Barangan, pp. 17-20.