



RESEARCH REPORT

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Reversion of Disused Fishpond Lease Agreement Areas to Mangrove Forests in Region VI, Philippines

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This paper focuses on evaluating the reversion of disused Fishpond Lease Agreement areas in Region VI (Western Visayas), Philippines to mangrove forests. The rehabilitation and restoration of mangrove areas are important given the substantial decline of mangrove forests in the country, particularly in Region VI. Results showed that the processes of cancellation and reversion of jurisdiction are fraught with challenges and problems resulting in a lower number of canceled FLAs and reverted FLA areas than what should be. The suitable area for reforestation was only 23% (284 ha) of the total area of FLA areas visited. Many disused FLA areas were located in the lower intertidal zone or foreshore area, thus not suitable for mangrove rehabilitation. The benefit of reforesting disused FLA areas suitable for reforestation far outweighs the cost of doing so. The options where the responsibility for paying for reforestation rests on lessees (performance bond, green tax/fine, fees reflective of economic rent, and beneficial use tax) will generate high amounts of funds and likely to have positive impacts on other desirable goals in aquaculture but are relatively difficult to implement. The options where the responsibility to pay for reforestation cannot be identified (DENR grant, foreign fund, private sector support) are relatively easy to implement but may generate lower amounts of funds and not sustainable. The study recommends the inventory of all FLA areas in the region, formulation and approval of FLA cancellation and reversion rules and guidelines, conduct of suitability assessment for reforestation of disused FLA areas in the region, and the actual reversion of suitable disused FLA areas to mangrove forests.

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EXECUTIVE SUMMARY

This paper focuses on evaluating the reversion of disused Fishpond Lease Agreement areas in Region VI (Western Visayas), Philippines to mangrove forests. The rehabilitation and restoration of mangrove areas are important given the substantial decline of mangrove forests in the country, particularly in Region VI. The study used a two-stage and five-step evaluation process. The first stage assessed the processes of Fishpond Lease Agreement (FLA) cancellation and reversion of jurisdiction over disused FLA areas from one government agency to another. The second stage assessed the actual reversion of disused FLA areas to mangrove forests. For this stage, the study used data from officially cancelled FLAs in the region whose areas were still with DA-BFAR or already reverted to DENR as well as not yet cancelled FLAs whose areas were officially identified as abandoned or undeveloped. Disused FLA areas were assessed in terms of suitability for reforestation. Those found suitable for reforestation were subjected to a cost-benefit analysis. The evaluation ended with an analysis of seven potential policy options for financing the reforestation using a set of criteria (feasibility, funds raised, ease in implementation, sustainability, and likely impact on other desirable goals). The study used multiple data collection methods including archival work, onsite ocular inspection of disused FLA areas, interviews, experts' opinion, intensive review of literature, and collection and assessment of pertinent records/data from government agencies. The study covered 62 disused FLA areas in four provinces (Iloilo, Negros Occidental, Guimaras, and Capiiz) in the region, representing 84% of the total 74 canceled FLAs (regardless of whether reverted or not to DENR), as well as FLA areas that had been abandoned or left undeveloped. Results showed that the processes of cancellation and reversion of jurisdiction are fraught with challenges and problems resulting in a lower number of canceled FLAs and reverted FLA areas than what should be. The suitable area for reforestation was only 23% (284 ha) of the total area of FLA areas visited. Many disused FLA areas were located in the lower intertidal zone or foreshore area, thus not suitable for mangrove rehabilitation. The benefit of reforesting disused FLA areas suitable for reforestation far outweighs the cost of doing so. The options where the responsibility for paying for reforestation rests on lessees (performance bond, green tax/fine, fees reflective of economic rent, and beneficial use tax) will generate high amounts of funds and likely to have positive impacts on other desirable goals in aquaculture but are relatively difficult to implement. The options where the responsibility to pay for reforestation cannot be identified (DENR grant, foreign fund, private sector support) are relatively easy to implement but may generate lower amounts of funds and not sustainable. The study recommends the inventory of all FLA areas in the region, formulation and approval of FLA cancellation and reversion rules and guidelines, conduct of suitability assessment for reforestation of disused FLA areas in the region, and the actual reversion of suitable disused FLA areas to mangrove forests.

1.0 INTRODUCTION

1.1 Description of the Problem

The importance of mangrove areas has long been recognized. They are sources of food, livelihood, and income of communities. Moreover, mangroves provide other natural benefits, including coastal protection, erosion control, sediment trapping, and recycling of nutrients from terrestrial runoff and river discharges.

Unfortunately, mangroves have been disappearing in the country. Significant mangrove forest areas have been lost and degraded (Genio et al. 2007). The massive loss of mangroves happened in the 1960s and 1970s when the government encouraged aquaculture to increase food production in the country. Using external funding support (World Bank and Asia Development Bank), the government extended loans that resulted in intensive aquaculture and the conversion of many mangrove areas to fishponds (Primavera 1995; Escobar and Jacinto 2006; Hishamunda et al. 2009).

Around half of the 279,000 ha of Philippine mangroves disappeared between 1951 and 1988 due to conversion into milkfish or shrimp ponds (Primavera 2005). The country has long ago surpassed the optimal mangrove-pond ratio of 4:1 (four hectares mangrove area to a hectare of fishpond) that would ensure a healthy ecosystem.¹ In 1994, the total mangrove area was placed at 120,000 ha while fishponds covered 232,000 ha.² This means that as early as 1994, the ratio was already 0.5:1, the reverse of the optimal ratio.

To this day, mangroves continue to diminish due to unsustainable utilization and continued conversion to fishponds. This is despite the understanding of the multiple benefits of mangroves and the passage of laws and policies banning mangrove cutting³, preventing further conversion of mangroves areas to other uses, and the reversion of abandoned, underdeveloped and undeveloped fishponds to original mangrove state.

The mangrove-to-pond ratio may be restored to the ideal level by protecting the remaining mangrove cover and rehabilitating the degraded sites. The case for restoring or rehabilitating of mangrove areas to a sustainable use is strong. There have been a number of reforestation projects in the country where heavy funds were infused (Primavera and Esteban 2008; Samson and Rollon 2008). However, the long-term survival rates of mangroves were found to be generally low at 10-20% (Primavera and Esteban 2008). Poor survival can be traced to two factors: inappropriate species and site selection. The favored site is the seafront or lower intertidal to subtidal zones, which are not natural habitats of mangroves. Most reforestations have converted these areas into monospecific *Rhizophora* mangrove forests.

Mangrove experts recommend that mangroves should be returned to their original habitat. The optimal area for planting mangroves is the middle to upper intertidal zone (Primavera and Esteban 2008; Samson and Rollon 2008). However, most of these areas have long been converted to brackish water fishponds.

¹ Personal communication with Dr. Jurgenne Primavera, world-renowned expert on mangroves, who currently heads a project on mangrove management and rehabilitation in Panay Island with support from the Zoological Society of London. The optimal ratio is the ratio required to maintain ecological balance and sustain coastal productivity or the ratio that enables the attainment of maximum benefits from the ecosystem at minimal damage.

² Dr. Jurgenne Primavera's presentation at a Seminar-Workshop on FLA Cancellation and Mangrove Reversion, 28-30 July 2010, Grand Hotel, Iloilo City.

³ Section 71, RA 7161 (Revised Forestry Code of the Philippines)

One plausible way to bring the mangroves back in the middle intertidal zone would be the reversion of abandoned, underdeveloped, or underutilized fishponds (collectively referred to here as AUU or disused fishponds)⁴ under the Fishpond Lease Agreement (FLA) (Section 23, Fisheries Administrative Order [FAO] 197) (Melana et al. 2000; Primavera 2000; Rollon and Samson 2008; Primavera and Esteban 2008) (see Section 3.0). However, to this day, there has been no active effort from concerned government agencies to revert AUU fishponds into mangrove forests.

There have been calls from other sectors to reverse ponds under FLAs to mangrove forests. In September 2007, various stakeholders in Region VI called on the Department of Agriculture (DA) and the Department of Environment and Natural Resources (DENR) to implement their joint memorandum on the reversion of AUU fishpond areas covered by FLAs to mangrove forests (Burgos 2007). The memorandum provides that "all abandoned/idle/unutilized fishponds covered by FLAs are to be canceled by the DA's Bureau of Fisheries and Aquatic Resources [BFAR] and recommended to DENR for reversion to timberland or rehabilitation." In July 2010, the message was echoed through a petition letter by participants of a Visayas-wide workshop on FLA cancellation and mangrove reversion. Among many things, the petition letter called for the drafting of guidelines on FLA cancellation and reversion. A similar call for reversion came out during consultations conducted in Luzon (January 2010) and Mindanao (March 2011).⁵

According to Melana et al. (2000) and Yao (2000), the reversion of abandoned fishponds under FLAs as practiced in the country is an extremely difficult activity that requires considerable time and resources to accomplish. For this reason, there is little practical experience with restoring disused fishponds back into mangroves.

In view of the above, it is important to examine the policy of reverting disused FLA areas to mangrove forests and to develop some means of evaluation. This study evaluated the reversion of disused fishponds under FLAs to mangrove forests with focus on Region VI. This evaluation included an assessment of the processes involved in the cancellation of FLAs and the return of jurisdiction over disused FLA areas from BFAR to DENR, suitability assessment of disused FLA areas for mangrove reforestation, determination of the cost and benefit of the reversion, and financing options in mangrove reforestation.

1.2 Research Objectives

The study sought to evaluate the policy on reversion of abandoned, underutilized, and underdeveloped (or disused) fishponds under Fishpond Lease Agreements (FLAs) to mangrove forests in Region VI, Philippines. Specifically, it aimed:

1. To assess the process of identifying disused FLA areas.
2. To assess the process of FLA cancellation.

⁴“Disused” was used by Stevenson (n.d.) in his paper on “Disused Shrimp Ponds: Options for Redevelopment of Mangrove.” Disused shrimp ponds are unproductive and idle shrimp ponds.

⁵ The consultations in Luzon (January 2010) and Mindanao (March 2011) were organized by NGOs for Fisheries Reform, Conservation International, DENR-CMMO, and Fish Project (for Luzon consultation only). The Visayas consultation (July 2010) was organized by the Zoological Society of London and the German Technical Cooperation (GTZ). Resource persons and participants were from the academe, BFAR, DENR, NGOs, fish producers, environmental lawyers, and other stakeholder groups.

3. To assess the process of reverting the jurisdiction over FLA areas from DA-BFAR to DENR.
4. To assess the suitability of disused FLA areas for mangrove reforestation.
5. To determine the costs and benefits associated with reverting disused FLA areas to mangrove forests.
6. To analyze potential policies for financing the reforestation.
7. To recommend actions to improve the process of reversion of disused fishponds to mangrove forests.

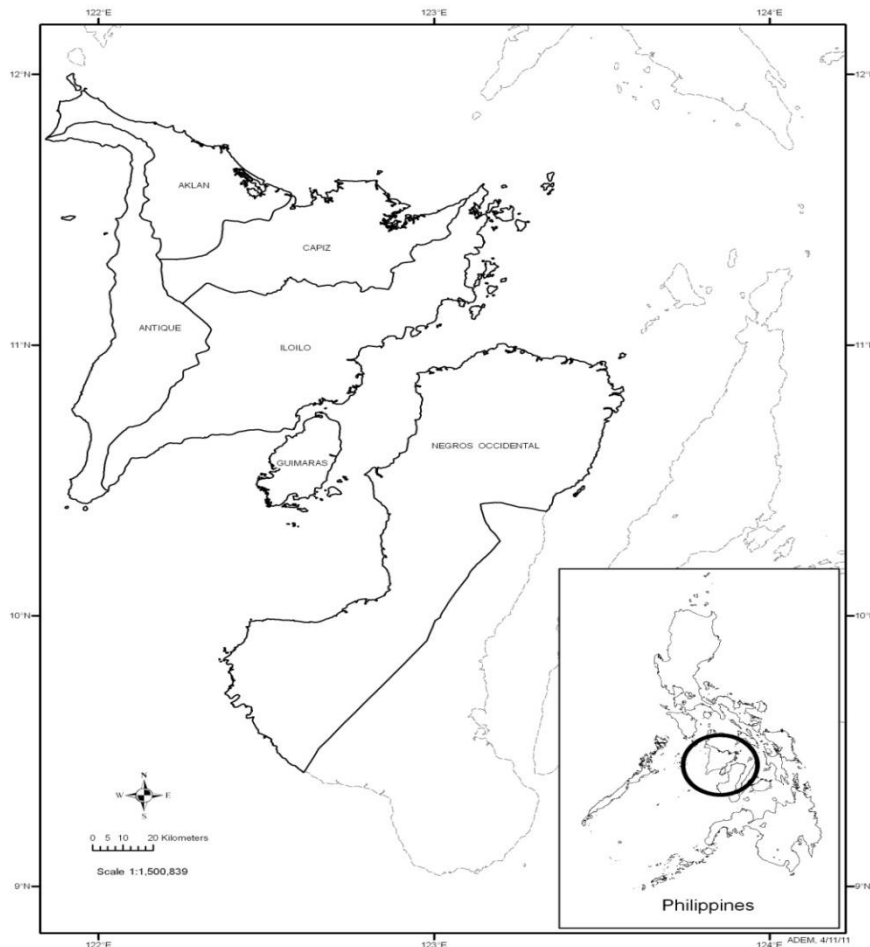
1.3 Significance of the Study

Sea level rise, the more frequent occurrence of natural disasters, and the need to increase productivity of the seas have highlighted the role of mangroves in coastal protection and, thus, the need to return them to their original habitat. The rehabilitation and restoration of mangrove areas are important given the substantial decline in mangrove forests in the country during the past century. One of the ways to bring mangroves back is the reversion of disused FLA areas into mangrove forests.

This study provides vital information that could serve as input in policymaking to improve the implementation of FLAs, the cancellation of FLAs and reversion of jurisdiction over an FLA area from BFAR to DENR, and the actual reforestation of disused FLA area to mangrove forest. Specifically, the study provides updated information on the process of identifying FLAs for cancellation, the cancellation process, the status of the FLA areas in the region as well as that of canceled FLAs for fishponds, the current practice of reverting the jurisdiction over FLA areas from BFAR to DENR, the suitability of disused fishponds for reforestation, the costs and benefits of reforesting disused fishponds under FLAs, and policy options to finance a reforestation project.

2.0 FOCUSING ON WESTERN VISAYAS

Region VI, or Western Visayas, is one of the 17 administrative regions in the Philippines. Located in the middle of the country, the region consists of six provinces: Aklan, Antique, Capiz, Guimaras, Iloilo, and Negros Occidental (Figure 1). The total land area is 20,614 km². In the 2007 Census of Population, the total population was 6.8 million, with a population density of 332 persons/km².



Source: Moscoso, Alan. 2010. University of the Philippines Visayas

Figure 1. Vicinity Map of Region VI, Philippines and Its Provinces

2.1 Very Low Mangrove-to-Fishpond Ratio

The declining mangrove forest in the country is mirrored in Region VI. With an estimated mangrove forest of 3,577 ha in 2003, the region ranked fourth among the country's regions with the least mangrove cover.⁶ It has the most extensively converted mangrove area to fishpond in the country. Experts estimated that 95% of the region's mangrove areas have been converted to fishponds, with the largest area located in the provinces of Aklan and Negros Occidental.⁷

Table 1 shows the estimated mangrove-to-pond ratio by province in the region. The optimal ratio of 4:1 is not met by any of the region's provinces. For every hectare of mangrove, there are 5.52 ha of fishpond (or for every 4 ha of mangrove, there are 22 ha of brackish water fishponds). The mangrove-to-pond ratio for Aklan, Capiz, and Iloilo are the most alarming.

⁶ FAO 2003 in Mangrove National Action Plan 2004.

⁷ Dr. Jurgenne Primavera, Seminar-Workshop on FLA Cancellation and Mangrove Reversion, 28-30 July 2010, Grand Hotel, Iloilo City, .

Table 1. Mangrove-to-Pond Ratio in Region VI

<i>Province</i>	<i>Brackish water Fishponds (ha)*</i>	<i>Mangrove area (ha)**</i>	<i>Mangrove to pond Ratio (1 ha mangrove to x ha of fishpond)</i>
Aklan	5,796.9759	447.0000	12.9686
Antique	295.8230	570.0000	0.5190
Capiz	10,288.1460	896.6000	11.4746
Guimaras	1,247.5323	822.0000	1.5177
Iloilo	10,264.8240	1530.0000	6.7090
Negros Occidental	9,225.0881	2453.3768	3.7602
Region VI	37,118.3893	6718.9768	5.5244

Source: *Data are from the Bureau of Agricultural Statistics, Aquaculture and Fisheries Division, collected on 17 March 2011; ** From PAWCZMS, DENR, Region VI, FY 2009 Physical and Financial Plan

2.2 The Most Number of Fishpond Lease Agreements Issued

Out of 4,518 FLAs issued in the country, 1,487 (33%) are in Region VI (Table 2). The region also has the largest FLA area in the country at 14,253.19 ha, equivalent to 24% of the country's total of 59,556.09 ha.

Table 2. Top Regions in the Country in terms of Number of FLAs Issued, 1973-present

<i>Region</i>	<i>No. of FLAs</i>	<i>%</i>	<i>Total Area (ha)</i>	<i>%</i>
Philippines	4,518	100.00	59,556.09	100.00
Region 6	1,487	32.91	14,253.19	23.93
Region 4	763	16.89	11,528.64	19.36
Region 5	462	19.23	7,278.31*	12.22

Source: Based on an updated list (21 July 2010) from the Fisheries Regulatory and Quarantine Division, Bureau of Fisheries and Aquatic Resources; *4th in rank in terms of total area

The region also has the most number of canceled FLAs and number of FLA areas reverted to DENR (Table 3). Out of 202 canceled FLAs (covering 6,389.59 ha) nationwide, 63 (1,330.92 ha, 31%) are in Region VI. Moreover, 21 FLA areas (477.75 ha) had been reverted to DENR, representing 58% of the number of total canceled FLAs nationwide and 36% in terms of area.

Table 3. Top Regions in the Country in terms of Number of Canceled FLAs and Corresponding Size of FLA Areas

<i>Region</i>	<i>No. of Canceled FLAs</i>	<i>Area Covered (ha)</i>	<i>FLA areas Reverted to DENR</i>	<i>Area Reverted to DENR (ha)</i>
Philippines	202	6,389.57	36	1,343.32
Region 6	63	1,330.92	21	477.75
Region 4	44	1,852.10	3	364.57
Region 5	27	508.46	1	12.49

Source: Based on an updated list (21 July 2010) from the Fisheries Regulatory and Quarantine Division, Bureau of Fisheries and Aquatic Resources

2.3 The Largest Area Released for Fishpond Development

The region has the largest area released for fishpond development in the country (36,315.28 ha, 33%) (Table 4). The figures are disturbing: while the FLA areas are not yet even half of the total area released, yet the mangroves are almost gone.

Table 4. Top Regions in the Country in terms of Size of Areas Declared Alienable & Disposable for Fishpond Development

<i>Region</i>	<i>Area Released for fishpond development (ha)</i>	<i>Area Under FLA (ha)</i>
Philippines	110,366.20 (100.00)*	59,556.09 (53.96)**
Region 6	36,315.28 (32.90)*	14,253.19 (39.24)**
Region 9	18,102.62 (18.04)*	8,253.69 (45.59)**
Region 3	17,761.25 (16.09)*	519.66 (2.93)**

Source: Based on an updated list (21 July 2010) from the Fisheries Regulatory and Quarantine Division, Bureau of Fisheries and Aquatic Resources; *as % of national total; **as % of area released for fishpond development

2.4 Number One in Milkfish Production

The region ranks second nationwide in terms of brackish water volume and area of production. In terms of milkfish production, it is number one, contributing one-third to total milkfish production for years 2004 to 2009 (Table 5).

Table 5. Brackish water Fishpond: Volume of Milkfish Production by the Top Three Regions, Philippines, 2004-2009 (metric tons)

	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>
Philippines	200,530.90	210,652.00	211,840.9	220,567.1	219,610.24	219,977.16
Western Visayas	62,714.20 (31.27)	66,249.00 (31.45)	67,327.7 (31.78)	71,067.14 (32.22)	67,906.61 (30.92)	75,997.57 (34.55)
Central Luzon	56,894.40 (28.37)	58,804.80 (27.92)	57,786.2 (27.28)	56,530.37 (25.63)	59,965.69 (27.30)	59,279.73 (26.95)
Ilocos Region	19,427.40 (9.68)	20,379.30 (9.67)	23,573.7 (11.12)	25,123.25 (11.39)	23,823.63 (10.85)	16,252.17 (7.34)

Source of raw data: Fisheries Statistics of the Philippines 2004-2009, Bureau of Agricultural Statistics; figures inside parentheses are % share to total volume

2.5 Disaster Prone Area

Many areas in the region have been identified as prone to potential geologic hazards (landslide, soil movement, and flooding) (MGB-6 2006). The flood-prone areas include 64 municipalities (55% of total) and 14 cities (88% of total). In 2008, the region suffered its worst flooding yet caused by Typhoon Frank, leaving 531 persons dead, 226 persons missing and presumed dead, and 2,555 persons injured (Burgos 2010). The typhoon also destroyed 11 bridges in Antique province and 16 bridges in Iloilo province. The total damage was estimated at PhP 3.505 billion, broken down as follows: PhP 609 million for rice, PhP 157 million for corn, PhP 29 million for agricultural facilities, and PhP 2.25 billion for fisheries (Go 2008). Damage to the fisheries sector is composed of PhP 1.25 billion for milkfish and PhP 1 billion for shrimp.

3.0 LEASING OF PUBLIC LANDS FOR FISHPOND PURPOSES

3.1 Definition of Fishpond Lease Agreement

A Fishpond Lease Agreement (FLA) governs the lease of public lands for fishpond development purposes. The Bureau of Fisheries and Aquatic Resources (BFAR) under the Department of Agriculture (DA) is the sole agency responsible for the issuance of FLAs. This is the only licensing function left with BFAR as far as aquaculture is concerned after the passage of the Fisheries Code in 1998 (Yap 1999).

The FLA is “an agreement entered into by and between the Secretary of Agriculture (DA) and qualified fishpond applicant for the use of public land for fishpond development purposes for a period of twenty-five (25) years” (Section 1, FAO 197). The FLA areas, on the other hand, are “mangrove forestlands and other swamps released to the Department of Agriculture/Bureau of Fisheries and Aquatic Resources (DA/BFAR) by the Department of Environment and Natural Resources (DENR) for fishpond purposes” (Section 3g, JAO 2008).

3.2 Issuance of Fishpond Lease Agreements through the Years

The origin of FLAs can be traced to 1937 (Fish and Game Administrative Order No. 14 in the Commonwealth Government) (Hishamunda et al. 2009; Yap 1999). The duration of FLAs started out at 10 years, renewable up to a maximum of 50 years. It was increased to 20 years in 1960 (FAO No. 60) and to 25 years in 1979 (FAO No. 129), which is still the current duration (Yap 2010). The 25-year duration for each lease period and the 50-year maximum were affirmed in the Philippine Fisheries Code of 1998 (Republic Act 8550).

By virtue of FAO 14 in 1937, individuals and corporations were granted a maximum of 200 ha each (Yap 2010). The succeeding years saw the reduction in the maximum area granted to individuals, while that for corporations increased. For individuals, the initial maximum level was lowered to 100 ha in 1954 and further to 50 ha in 1959. For corporations, it remained at 200 ha in 1954, but was later increased to 400 ha in 1959 and to 500 ha in 1975. In 1998, the area allowed to be granted to corporations was reduced to 250 ha, and this holds until today.

The 1970s was a decade of rapid expansion of fishpond development. Two important laws were passed at the time. The Fisheries Decree of 1975 (PD 704) made public lands available for fishpond development. The Revised Forestry Code (PD 705) of the Philippines released mangroves and other swamps not needed for shore protection for fishpond purposes and placed under the Bureau of Fisheries and Aquatic Resources (BFAR).

According to Kraft (1997), the FLA issuance is one of the “forerunners of contemporary government efforts to ‘privatize’ or ‘semi-privatize’ state owned assets.” Before 1972, many of the FLA areas were declared Alienable and Disposable and were sold and eventually titled (Hishmunda et al. 2009; Yap 2010). With the passage of Presidential Decree 704 in 1975, this practice was stopped. Section 23 of the Decree states that ‘no public lands suitable for fishpond purposes shall be disposed by sale...only those fishpond sales patent already processed and approved on or before November 9, 1972, shall be given due course.’

In 1988, with the passage of the Comprehensive Agrarian Reform Law (CARL), all fishponds, whether private or public, including those under FLAs, were included for distribution with a 5-ha retention limit set (Yap 1999). In 1995, the law was amended to exclude fishponds and shrimp ponds. This was after the fishpond operators filed a petition for exemption of fishponds. BFAR supported their position. Many FLA fishponds were still subdivided into 5-ha lots, but these were “paper divisions” only because the fishponds were still operated as a single farm unit (Yap 2010).

3.3 Current Governing Policies on Fishpond Lease Agreement

Fishpond Lease Agreements are governed by Sections 45-50 of the 1998 Philippine Fisheries Code (RA 8550). FAO No. 197, Series of 2000, provides the rules and regulations governing the lease of public lands for fishpond development. The salient lease conditions include:

- No more than 50 ha for individuals and 250 ha for corporations or fisher folk organizations.
- Lease is for a period of 25 years and renewable for another 25 years.
- Lease rates to be determined by BFAR. All fees collected shall be remitted to the National Fisheries Research and Development Institute (NFRDI) and other qualified research institutions to be used for aquaculture research development.
- Leased area should be developed and producing on a commercial scale within three years from the approval of the FLA. All areas not fully producing within five years from the date of approval of the FLA shall automatically revert to the public domain for reforestation.
- No subleasing in whole or in part.
- Transfer or assignment of rights under the FLA must only be upon prior written approval of BFAR.
- Lessee to undertake reforestation of river banks, bays, streams, and seashore fronting the dike of fishpond subject to the rules and regulations to be promulgated.
- Lessee to provide facilities that will minimize environmental pollution, i.e., settling ponds, reservoirs, etc.

Failure of lessees to comply with any of the above conditions shall mean cancellation of the FLA. Moreover, to avoid cancellation, the lessee must introduce improvements to the area within 180 days from the date of issuance of the lease.

3.4 Unintended Consequences and Concerns on FLA Issuance

Issuance of FLAs was expected to stimulate aquaculture production. However, in addition to mangrove disappearance, a number of economic and institutional issues and concerns resulted from it. Kraft (1997) had recommended earlier the conduct of an investigation to determine the true economic losses associated with the FLA issuance.

3.4.1 Inequity

FLA issuance is far from being equitable. By giving the right to use several hectares of public land to an individual or a corporation, local people are denied access to these areas. While the lessees and their caretakers generate private benefits from the fishponds, the local people are deprived of direct and indirect services of mangroves and face environmental challenges resulting from the disappearance of mangroves (forgone benefits).

Only those who can afford to develop an FLA area for fishpond purposes can be granted lease. One of the initial requirements in the filing of fishponds application is a certificate of bank deposit issued by any banking institution, showing that the applicant has an initial capital in cash of PhP 10,000/ha or fraction thereof and/or its equivalent assets (Section 8d, FAO 197). It is no surprise that the list of lessees includes politicians, rich people, and businessmen. Many of them are not residents of the area (i.e., municipality) where the fishponds are located.

3.4.2 Low rentals

The use of the resource is almost free, given the very low fees and annual rentals (Table 6). The rental rate started from PhP 50/ha per year (USD 1.15) in the 1950s and went up to PhP 1,000/ha per year (USD 23.09) in 1991 (FAO 125-1). Under the 1998 Fishery Code, the fee was set at PhP 500/ha per year (USD 11.55) starting in 2000, with an annual increase of PhP 1,000/ha per year (USD 23.09) by 2004 (FAO 197-14).

When BFAR issued FAO No. 125-1 in 1991, which increased the fishpond lease from PhP 50/ha to PhP 1,000/ha per year to reflect actual economic rent, the industry through the Chamber of Fisheries and Aquatic Resources obtained a Temporary Restraining Order (TRO) from the Court of Appeals effectively on the implementation of the new guideline (Yap 1999). Ironically, as early as the 1990s, the Fisheries Sector Program already recommended an FLA fee of USD 156/ha (equivalent to PhP 3,809.21 in 1994)⁸, which is way higher than the current annual fee of PhP 1,000/ha (White and De Leon 2004).

The low fees fail to reflect the opportunity cost of the land and the damage done on the resources. Further, they encourage the conversion of mangrove forest to fishponds, more land acquisition, and extensive farming, while the responsibility to efficiently manage the ponds is diminished. Earlier, Kraft (1997) suggested putting in place “low-powered incentives” for lessees. According to him, increasing the rent will reduce the incentive power enjoyed by lessees, thus increasing social welfare.

⁸ USD 1-PhP 24.418 as of 31 December 1994 from Historical Exchange Rate Regime of Asian Countries, Philippines, http://intl.econ.cuhk.edu.hk/exchange_rate_regime/index.php?cid=1

Table 6. FLA Rental Fees

<i>Fisheries Administrative Order</i>	<i>Annual rental per hectare or fraction thereof (in PhP)</i>	<i>Annual rental, minimum for one area</i>
1937	1.50	2.00
14-2, s. 1945	3.00	3.00
14-4, s. 1950	For ordinary fishpond permit: 5.00 for the first 2 years, 10.00 from the third year; 10.00 for those holding a 10-year lease contract	5.00
14-8, s. 1955	For ordinary fishpond permit : 5.00 for the first 2 years, 10.00 for the first 4 years beginning 1954, and 10.00 from the fifth year; 10.00 for those holding a 10-year lease contract	5.00
14-10, s. 1956	For ordinary fishpond permit : 6.00 for the first year; 7.00 for the second year; and an increase of 1.00 per year for the succeeding years, but not to exceed 10.00 a year	6.00 rental, maximum per hectare or fraction thereof
125, s. 1979	Starting 1 January 1980 the annual rental rate is 30/ha or fraction thereof for the first 5 years. After the 1985 annual rental is paid, subsequent annual rental shall be due and payable on the first working day of January each year. On the sixth year and the years following thereafter, the annual rentals shall be 50/ha or fraction thereof.	
125-1, s. 1991	Starting 1 January 1992 the annual rental shall be 1,000/ha. However, any fraction of a hectare shall be charged the corresponding fraction of 1,000.00.	
197, s. 2000	Starting 1 January 2000 until 31 December 2000, the annual rental shall be 500/ha or a fraction thereof; second year, 600/ha or a fraction thereof; third year, 700/ha or a fraction thereof; fourth year, 800/ha or a fraction thereof; fifth year, 1,000/ha or a fraction thereof, and then yearly thereafter.	

Moreover, according to key informants, the fees collected from fishpond rentals are not being channeled to the National Fisheries Research and Development Institute (NFRDI) and other qualified research institutions to be used for aquaculture research development as stipulated in Section 46 of RA 8550. Instead, these are remitted to the National Treasury.

3.4.3 Low productivity

There is no systematic recording and data basing of FLA areas for production. Most of the information is from small surveys. The Bureau of Agriculture and Statistics conducts an inventory of aquaculture production but does not report fishpond production by type of fishpond.

Yap (2010) estimates that the present FLA areas represent 26.2% of the total brackish water fishpond and mirror the condition of all brackish water fishponds. Yap (2007) shows that although brackish water fishponds share 87% of the total aquaculture area, they contribute only 52.8% to total production and have the lowest average yield (1.06 t/ha) compared with freshwater ponds (5.19 t/ha) and pens and cages (7.59 t/ha). Yap (2010) concluded that “reversion of all the present FLA areas to mangrove will not significantly affect total fish production and loss can be easily replaced by marine cages and small freshwater ponds for tilapia.”

3.4.4 Low impact on employment

The country has 59,556.09 ha of brackish water fishponds under FLAs. About 80% of the ponds in the country are mostly used for milkfish production, usually in extensive culture (Hishamunda et al. 2009). According to an aquaculture expert, a 10-ha

extensive milkfish fishpond has only one caretaker. If this is so, then the FLA areas in the country have generated about 5,956 jobs only. Similarly, the total FLA area of 14,253.19 ha in Region VI has generated 1,425 jobs only. Considering maintenance work (e.g., dike repair), then the number of seasonal jobs created would be 4,275, based on an aquaculture expert's estimate of three maintenance workers for every 10-ha pond. In big FLA areas, there is one caretaker for every 15 ha of fishponds. Moreover, according to key informants, if the lessee is not from the local area, then the probability is high that the caretaker (even the maintenance workers) is not from the local area also.

Meanwhile, during the boom of the shrimp industry from the 1980s to the 1990s, employment was high in FLA areas. The intensive technology used in shrimp ponds required many workers (about 6 workers/ha). With the decline of the industry, many shrimp ponds had been converted to extensive milkfish production.

3.4.5 Inability to monitor and enforce regulations

Between 1987 and 1998, BFAR was reduced from a line to a staff bureau⁹. During this period, BFAR's regional offices were under the DA regional offices. The BFAR Central Office communicates to the regional offices via the DA Regional Offices. With the passage of the 1998 Fisheries Code, BFAR was made a line bureau again and given the mandate to have a direct presence in the regional and local government levels. New tasks were given but no regular positions were added. Many members of the staff were hired on contractual basis.

The continuing staffing problem at BFAR has affected the monitoring of FLA areas and record reconciliation has been slow. Earlier, Kraft (1997) observed that "the capability of BFAR in monitoring the technology and effort levels of FLA leaseholders is totally nonexistent." Recently, the Commission on Audit noted the "lack of personnel from BFAR Fisheries Regulatory and Quarantine Division to monitor/ inspect validate, and issue demand letters to delinquent fishpond lease holders" (COA 2010).

Moreover, a key informant emphasized BFAR's lack of enforcing power with regard to FLAs. Although BFAR has the mandate to cancel FLAs, implementation is not easy because of the risks involved. Police assistance can be requested during field operations but this is normally a long process requiring a court order.

3.4.6 FLA areas not optimally utilized

Field visits in Region VI revealed that a number of FLA areas are active in paper only; they are in fact disused but their FLAs have not been canceled. This situation appears to be the same in many regions in the country as discussed during the Luzon, Visayas, and Mindanao consultations on AUU reversion to mangrove forests. Earlier, White and De Leon (2004) reported that most FLA areas are underutilized or used for purposes other than aquaculture.

Key informants mentioned that possession of a fishpond area has become an end in itself rather than a means to produce food. Field visits reveal that a number of FLA areas are "hobby farms." This is not surprising since fishpond operation is not the lessees' primary source of income. The high maximum area that can be leased (50 ha for individual and 250 ha for corporation or cooperative) and the low rental encourage application for an area that is more than what can be handled efficiently.

⁹ Interviews with key informants knowledgeable of the history of BFAR.

Earlier, Llanto and Magno (1994) found that fishpond operators generally do not utilize the total fishpond area for productive purposes. Their study found that, on the average, only about 91% of milkfish area and 85% of prawn area had been developed. Some farms (about 10% of the sample) had developed only half of their total fishpond area. Insufficiency of funds was the major reason cited for the lack of development. The second reason was unsuitability of the area, which stems from factors such as peace and order situation, inaccessible location, high salinity, and lack of tidal water.

3.4.7. Poor collection of fees

COA (2010) reported the continued failure to collect rental fees and surcharges from FLAs. For CY 2007-2009, the amount uncollected increased to PhP 84.658 million, thereby decreasing the collection efficiency of the BFAR Central Office (Table 7). Similarly, the regional offices reported uncollected income from FLAs (inclusive of penalties and surcharges) totalling PhP 151.581 million as of 31 December 2009 (Table 8). These amounts mean that the government was being deprived of additional revenues amounting to PhP 236.240 million as of 31 December 2009.

Table 7. BFAR Central Office's FLA Rental Fee Collection Efficiency Rate

<i>Year</i>	<i>Amount Collected (PhP)</i>	<i>Amount Uncollected (PhP)</i>	<i>Collection Efficiency Rate (%)</i>
2007	27,405,849.23	25,890,350.77	51
2008	24,595,616.05	28,700,583.95	46
2009	23,228,646.00	30,067,554.00	44
Total	75, 230, 111.28	84,658,488.72	

Source: Commission on Audit (COA). 2010. 2009 Annual Audit Reports – NGAs, Department of Agriculture, Bureau of Fisheries and Aquatic Resources. Downloaded on 12 January 2011 from <http://www.coa.gov.ph/Audit/AAR.htm>.

Table 8. Uncollected Income from FLA Areas in Seven Regions

<i>Regional Office</i>	<i>Amount (in PhP)</i>
RFO III	2, 256,840.00
RFO IV-A	43,858,830.00
RFO IV-B	Undetermined
RFO VI	11,628,000.00
RFO VII	33,657,912.50
RFO IX	51,518,771.00
RFO XII	2,416,589.93
RFO XIII	6,244,365.00
Total	151, 581,308.43

Source: Commission on Audit (COA). 2010. 2009 Annual Audit Reports – NGAs, Department of Agriculture, Bureau of Fisheries and Aquatic Resources. Downloaded on 12 January 2011 from <http://www.coa.gov.ph/Audit/AAR.htm>

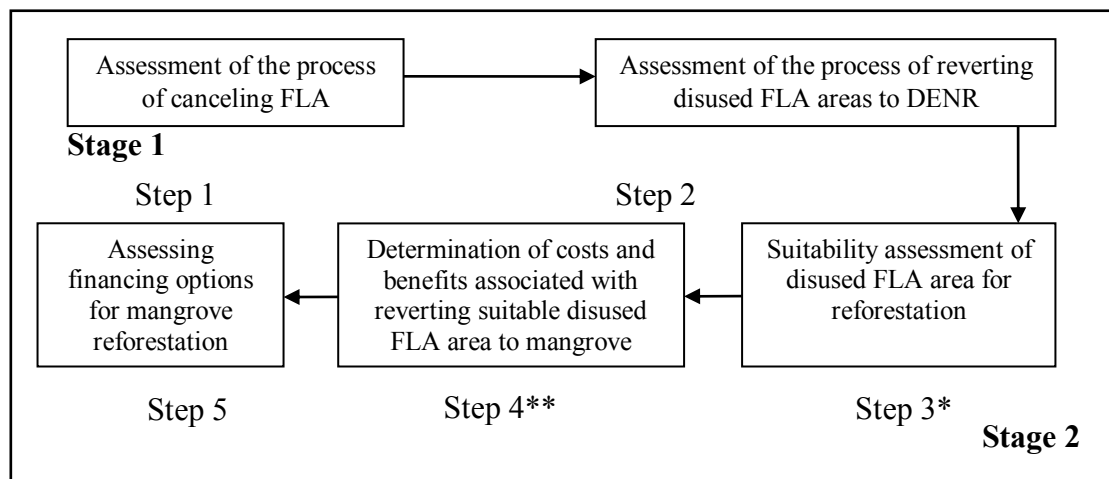
4.0 METHODOLOGY

4.1 Evaluation Stages, Steps, and Criteria for Analysis

The reversion of disused FLA areas to mangrove forest involves a long and complicated process. Reflecting this reversion process and breaking it down to manageable parts, the evaluation procedure adopted in this study involves two stages with five steps (Figure 3), which are in chronological order. There are necessary conditions to be met before the next step can be undertaken.

4.1.1 Stage 1: Return of FLA area jurisdiction from BFAR to DENR

The first stage involves the return of jurisdiction from BFAR to DENR over FLA areas identified to be abandoned, undeveloped, and underutilized (or disused). BFAR is in charge of the cancellation process. Once the FLA areas are identified for cancellation, the cancellation and the reversion processes proceed.



* Evaluation advances to Step 4 when the FLA area is found suitable for reforestation.

**Evaluation advances to Step 5 when net benefits are positive.

Figure 2. Stages and Steps Involved in Evaluating Reversion of Disused FLA Areas to Mangrove Forest

Step 1: Assessment of the FLA cancellation process

The process of reverting disused FLA areas to mangrove forest starts with cancellation, specifically, identifying areas for FLA cancellation. In the study, the assessment focused on identifying areas for FLA cancellation, the number of canceled vis-à-vis the number of potential areas for FLA cancellation, the reasons for cancellation, and the challenges in FLA cancellation.

Step 2: Assessment of the process of returning the jurisdiction over disused FLA areas from BFAR to DENR

After cancellation of an FLA, the Department of Agriculture, on the recommendation of BFAR, may either open the area for application or revert it to DENR for restoration to mangrove forest, depending on the level of development of the area for fishpond purposes. If the FLA area is abandoned, underutilized, and undeveloped, then it qualifies for “automatic” reversion to DENR jurisdiction. The

assessment focused on the process of turnover of disused FLA areas from BFAR to DENR, the number of disused FLA areas reverted to DENR vis-à-vis the potential number of disused FLA areas, and the challenges associated with the reversion process.

4.1.2 Stage 2: Actual reversion of disused FLA area to mangrove forest

The second stage involves the actual reversion of disused FLA areas now under DENR to mangrove forests. DENR is in charge of the process. This stage involves assessing if the disused FLA areas are suitable for reforestation. If they are found suitable, the process advances to Step 4 for determination of the reversion costs and benefits. If net benefits are positive, the evaluation advances to Step 5, wherein potential policies to finance the reversion are analyzed. Table 9 presents the specific criteria and indicators.

Table 9. Criteria in Evaluating the Reversion of Disused Fishponds to Mangrove Forests

<i>Step 3</i> <i>Suitability assessment of disused FLA areas for reversion to mangrove forests</i>	<i>Step 4</i> <i>Determination of costs and benefits associated with reverting disused FLA areas to mangrove forests</i>	<i>Step 5</i> <i>Analysis of potential policies to finance mangrove reforestation</i>
<ul style="list-style-type: none"> • Level of fishpond development¹⁰ • Presence and functionality of dikes; water level and control structures; production level 	<ul style="list-style-type: none"> • Cost of restoring hydrology • Cost of nursery bagging • Cost of nursery shed • Cost of outplanting • Maintenance cost • Cost of dealing with squatters 	Policy options: <ul style="list-style-type: none"> • Performance bond imposition • Green fine imposition • Beneficial use tax • Increasing lease and other rentals • Seek DENR grant • Seek private sector support • Seek funding source grant
<ul style="list-style-type: none"> • Suitability for reforestation • Middle to upper intertidal • Freshwater input • Presence of mature fruit bearing trees • Seedlings growing 	<ul style="list-style-type: none"> • Benefits from mangroves 	Criteria for analysis <ul style="list-style-type: none"> • Political feasibility • Funds generated • Ease of implementation • Sustainability • Likely impacts on other desirable goals
<ul style="list-style-type: none"> • Natural vegetation or assisted planting 		

Step 3: Suitability assessment of disused FLA areas for reversion to mangrove forest

The suitability analysis is important because it is possible that many of the environmental conditions that promote growth of mangrove forests are no longer present or have been severely altered (Stevenson n.d.). Thus, environmental parameters remaining in the area need to be ascertained to facilitate identification of areas suitable for mangrove reforestation and of site characteristics with bearing on the cost of reforestation. The information forms as basis for computation of the costs of reforestation in the next step of evaluation (Step 4).

The study team visited areas whose FLAs had been canceled and those areas that were officially identified abandoned and undeveloped to facilitate assessment of their suitability for reforestation using environmental parameters. The FLA areas were

¹⁰ Based on definition available in FAO 197

located using the survey plan duly authenticated by DENR available at the BFAR records on FLAs and information from local people.

Step 4: Determination of the costs and benefits of mangrove reforestation

FLA areas suitable for reforestation advance to Step 4, wherein the cost of reforestation is determined. The approach used was simply the “restoration or replacement cost,” which is straightforward: how much would it cost to restore the mangroves to their natural habitat? The cost would depend on the mode of reforestation (natural regeneration or active planting), the suitable species, and the site. For areas requiring natural regeneration, the relevant costs are monitoring costs and cost of restoring hydrology (if necessary).

The study used the restoration cost of degraded mangrove areas of the Zoological Society of London, an NGO based in London (AMT Guzman, personal communication). Since 2008, this NGO has been helping peoples’ organizations in selected sites in Region IV restore degraded mangrove areas, including one disused FLA area in Guimaras (the only reforestation activity in disused FLA area currently in the region). The costs are for the species *Avicennia* and *Sonneratia*, which are natural colonizers. These are the same species recommended for the disused FLA sites visited in this study.

To restore hydrology, the assessment showed that only breaking of dikes is needed to allow complete exchange of water. To compute the monitoring cost, the number of workers and the number of days needed to do the work were estimated considering the size of the area. Local labor cost was used. For FLA areas requiring outplanting, the relevant costs include nursery bagging, construction of nursery, outplanting, and monitoring cost. Moreover, the assessment also determined the scale of squatting problem in abandoned fishponds (i.e., how many of the sites have squatters and the extent of their settlement).

The total cost of restoration was estimated on a per hectare per year basis. Primary data were not collected to calculate the benefits of mangroves. Instead, calculation of such benefits relied on information from the literature. The values were discounted using 5%, 10%, and 15% discount rates. It was assumed that mangroves are grown trees by year 15.¹¹ Net benefits were computed under the assumption of no mangrove harvesting, in consonance with Republic Act 7161 of 1990, which bans all cutting of any mangrove species, and with harvesting. Comparing the net benefits with and without harvesting highlights the marginal change in the net benefit if harvesting is allowed.

Step 5: Analysis of potential policies to finance mangrove reforestation

When net benefits are positive, the evaluation advances to Step 5. This step asks “Who is going to pay for the restoration?” At this step, seven potential policies for payment of reforestation were reviewed. These were from recommendations made by previous studies, reports, and preliminary interviews with key informants in August 2010. Adapting Holl and Howarth (2000), the potential options were classified as to who is responsible for the restoration cost: the FLA lessee or no responsible party. If the

¹¹ According to mangrove experts.

responsibility is with the FLA lessee, then the next question is when the responsibility should be assigned: before the damage or after the damage (Table 10).

Table 10. Potential Financing Options Evaluated

<i>Lessee as responsible party</i>		<i>No responsible party</i>
<i>Responsibility is assigned before damage</i>	<i>Responsibility is assigned after damage</i>	
<ul style="list-style-type: none"> • Performance bond imposition • Lease and fees reflective of true economic rent 	<ul style="list-style-type: none"> • Green tax/fine imposition • Beneficial use tax imposition 	<ul style="list-style-type: none"> • Seek DENR grant • Seek private sector support • Seek funding source grant

The different financing options are as follows:

- **Performance bond** – The performance bond shall be imposed on all renewals (note: no more new applications are allowed) and transfers of FLAs, and should be enforced during the whole life of the contract. The purpose is to ensure that lessees perform their duties and responsibilities.
- **Lease and all other fees related to FLA are reflective of economic rent** - Rentals, surcharge for late payment, and all other related fees should reflect the opportunity cost of the resource. This means that the current low rentals and fees related to the FLA should be increased. A percentage of the funds can be channeled to the restoration of damaged mangrove areas and at the same time promotion of efficient use of the FLA area assigned.
- **Green fine** – The operation of FLA areas can cause environmental harm. The green fine shall be imposed on lessees who do not comply with existing fishery laws, rules and regulations, particularly on pollution. Thus, accountability is secured after the damage is done.
- **Beneficial use tax** - This is a payment for the beneficial use of public land; it should not be misunderstood as payment for the land. It functions similarly to increased lease and rentals.
- **DENR grant** – Restorations will be paid for by the general taxes at the national level that go into the budget of DENR. This option does not target the party responsible for the damage (i.e., lessees) but will be beneficial to the society as a whole.
- **Foreign funding support** – This means seeking funds from foreign donors.
- **Private sector support (volunteers, donations)** – The private sector (volunteers, corporations with corporate social responsibility programs, youth, other organizations), for a range of reasons, may contribute directly or indirectly to mangrove restoration.

The possible policies were assessed using a criteria set: feasibility, funds raised, ease of implementation, likely impact on other desirable objectives, and sustainability. Feasibility refers to the level of preference ranking of stakeholders (LGU managers, aquaculture managers, environmental managers, and mangrove and aquaculture experts) as reflected in their individual assessment ranking of the options and the possibility of acceptance of the lessees. A rank of 1 is deemed “very high”, rank 2 or 3 is “high”, rank

4 is “moderate”, rank 5 or 6 is “low,” and rank 7 is “very low.” Funds raised refers to the potential amount to be generated with the implementation of the policy. Ease of implementation refers to the extent of regulatory, legislative, and administrative requirements for the option to be implemented. It is also important that the option will not only provide funds for reforestation but can also address other desirable societal or aquaculture goals such as reduction in inequity, increase in production efficiency, and increase in compliance with environmental laws and regulations. The option must also meet the sustainability criterion, which means funds can be collected regularly.

Table 11 presents the criteria and the specific indicators under each criterion used in evaluating the options. Each criterion was evaluated using a simple three-point scale (high, moderate, low), where the definition differs for each criterion. To highlight similarities and differences of the options in terms of their feasibility, ease of implementation, attainment of other desired goals, and sustainability, one point was assigned whenever an option is likely to meet an indicator (even in the most lenient sense). In terms of funds generated, the higher the amount, the better. The option was given one point whenever the amount generated can cover the cost of reforestation. The information was based on data collected from key informants and secondary data.

Table 11. Criteria in Evaluating the Seven Financing Options

<i>Feasibility</i>	<i>Ease of implementation</i>	<i>Likely impact on other desirable goals</i>	<i>Sustainability</i>	<i>Funds Generated</i>
<ul style="list-style-type: none"> • Preferential ranking of experts • Preferential ranking of environment managers • Preferential ranking of aquaculture managers • Preferential ranking of LGU managers • Possibility of acceptance by lessees 	<ul style="list-style-type: none"> • Does not need legislation • Does not require proposal for submission • Does not need study to determine optimal rate or does not need to be supported by a study • Does not require additional inputs such as personnel and equipment • Low enforcement and monitoring cost 	<ul style="list-style-type: none"> • Reduction in inequity • Increase in production efficiency • Increase in compliance with environmental laws and regulation 	<ul style="list-style-type: none"> • Regular payments 	<ul style="list-style-type: none"> • Amount generated

4.2 Data Collection

The study employed multiple data collection methods at each stage (or step) of the evaluation.

4.2.1 Archival work and records examination

A letter was sent to BFAR Central Office, requesting access to the official list of all canceled FLAs in Region VI, the original folders of the FLA holders in the list, and

37 randomly selected folders of FLAs identified as still active. The examined folders contained voluminous information on the concerned FLA areas. The folders of FLAs already canceled contained the documents leading to their cancellation. For FLAs that are still active, their folders contained documents leading to the award of lease, their payment, and production records, among other things.

4.2.2 Groundtruthing and team meeting

The ocular inspection of disused FLA areas (groundtruthing) was essential in assessing the suitability of the areas with canceled FLAs or reverted for mangrove planting. The permission and assistance of the LGUs were sought. The LGUs provided the research team with local technical people and field guides during the field visits. Most of the FLA areas were located in sites where security and transportation were a challenge.

The original survey plans secured from BFAR Central Office's FRQD Records Section were very helpful in locating the FLA areas to be visited. Prior to the site visits, digital aerial maps available in the Internet were secured. The maps were complemented by knowledge of the area by the local people.

Groundtruthing was conducted from September to December 2010. On average, a visit to one FLA area took half a day; 3-4 hours were spent on actual ocular inspection of the area. Information gathered included past and current use of the area, extent of mangrove growth expressed as percentage of area covered, and nearby presence of freshwater input. If operating as fishpond, then the information gathered included state of dikes, sources of water and water control structures, species produced, volume of production, cost of labor, and other uses of the ponds.

After all FLA areas in the list were visited and other relevant information on the sites was collected, the team had a meeting to review each of the 27 sites (62 FLA areas) visited. Photos and videos taken of the sites were used to facilitate the discussion, which focused on suitability for reforestation, suitable species, and method of restoration.

4.2.3 Map making

The maps of FLA areas obtained from BFAR Central Office had technical descriptions (bearings and distances) either in tabular form or written along the sides of the polygons. The technical descriptions were transformed into shape files (data format used in GIS) using the NWF/DEM 1.3 data editing extension of ArcView software. The initial points of the tie line were based either on the coordinates written on the map or from cadastral records of boundary monuments from the Bureau of Lands and DENR VI. There were instances when the reported coordinates would fail to locate the actual site of the ponds. When this happened, ponds were plotted based on the adjoining FLAs or adjacent natural features such as rivers or coastline boundaries.

The FLA ponds were verified in the field using a Global Positioning System (GPS) receiver – Garmin Etrex Vista HCx. The ground coordinates taken with the GPS were also used to plot the boundaries of FLAs with no available maps from BFAR. The pond areas were then plotted on a map with a Google Earth® image used as background to show the actual natural features of the surrounding area.

4.2.4 Collection and assessment of relevant reports and raw data

Pertinent reports and raw data were secured from the websites or offices of DENR Region VI, DENR Coastal and Marine Management Office (CMMO), DA-BFAR Region VI, DA-BFAR National Office, Bureau of Agricultural Statistics, Agricultural Credit and Policy Council, local government units, and libraries.

4.2.5 Interviews

The local people (technical people sent by the LGU and local residents) who accompanied the team during the site visits were interviewed on the history of the FLA areas and the surrounding areas. Various types of key informants were also interviewed through letters, phone calls, and e-mails. The key informants include:

- Fourteen LGU managers: 1 former city administrator, 1 executive assistant to barangay affairs, 2 agriculture officers, 1 supervising agriculturist, 2 agriculture technicians, 6 aquaculturists, and 1 environment management specialist. The interview focused on their knowledge of the FLA program, role of the LGU in the FLA, impact on the local economy of the FLA areas, suitability of FLA areas for fishpond production, mangrove reforestation, and recommendation for FLA areas.
- Two Protected Areas, Wildlife and Coastal Zone Management Services (PAWCZMS) chiefs and 2 CMMO chiefs from DENR national, regional, and provincial offices. The topic was on the role of their offices on the reversion of FLA areas and the status of reverted FLAs in their areas of jurisdiction.
- Seven BFAR personnel: 2 division chiefs (national level), 1 regional director, 1 fishery regulation officer, 1 staff, 1 former BFAR legal officer, and 2 provincial fishery officers. The topic was on the status, issues, concerns, and other relevant information on the FLAs.
- Three aquaculture researchers and 2 NGO executive directors, who were interviewed on aquaculture history, existing and proposed policies for FLA, status and production, and other FLA relevant issues.
- Ten FLA lessees. The LGU managers helped in identifying and locating FLA lessees who were willing to participate in the study. They were interviewed on the utilization of their fishpond areas, production cost and revenue, and other relevant information.

4.2.6 Experts' opinion

Two mangrove experts were interviewed on mangrove reforestation. One of them was assisting the research team in determining the suitability of the visited FLA areas for mangrove reforestation. Whenever possible the mangrove expert joined the team during ocular inspection. When absent during ocular inspection, the expert made the assessment based on photo documentation and the indicators' checklist. The GIS expert of the team was tasked with locating and measuring the area, mapping, and sketching all the visited FLA areas. DENR experts on land survey and mapping were also consulted to clarify map-related issues.

4.2.7 Observation

When visiting a particular FLA, the researchers took note of the condition of fishponds along the way and those adjacent to the FLA area being visited. Whenever possible, local people were asked about the identity of the owner of the fishponds observed as not being actively used or with mangroves growing. The names were then checked against the BFAR list of lessees.

4.2.8 Sharing of results and validation meetings

The results of the study were presented to stakeholders for sharing purposes and to the key informants for validation purposes. Results were presented during meetings held in BFAR Central office, office of NGO for Fisheries Reform, DENR VI, Zoological Society of London, and offices of individual key informants and other stakeholders. During these meetings, more insights were generated and incorporated in the final report. The usefulness of the study results was highlighted.

5.0 FISHPOND LEASE AGREEMENT AREAS IN REGION VI

5.1 Profile of Fishpond Lease Agreement Areas in Region VI

Based on official records¹², 1,487 FLAs have been issued in the region covering an area of 14,253.1861 ha (Table 12). Among the six provinces in the region, Iloilo has the highest number of FLAs granted (512 FLAs, 5,226 ha), followed by Aklan (334 FLAs, 3,355.58 ha), and Negros Occidental (323 FLAs, 3,098.06 ha). It appears that this is the list of currently active FLAs.

Another official list published at the DA-BFAR official website¹³ shows 1,500 FLAs granted to individuals/groups in Region VI from 1973 to present, covering an area of 14,298.76 ha. The list still includes the 12 FLAs that are already in the official list of canceled FLAs available at the BFAR-FRQD office. This is the main reason for the discrepancy with the other list. However, this list provides important information, particularly on the date of expiry of the FLAs.

Table 12. Fishpond Lease Agreements Issued in Region VI

Province	FLA		Total Area (ha)	
	No.	%	Area	%
Aklan	334	22.46	3,355.5794	23.54
Antique	5	0.34	150.6466	1.05
Capiz	219	14.73	1,722.3859	12.08
Guimaras	94	6.32	700.0729	4.91
Iloilo	512	34.43	5,226.4490	36.67
Negros Occidental	323	21.72	3,098.0564	21.73
Region VI	1,487	100.00	14,253.1861	100.00

Source: Based on an updated list (21 July 2010) from the Fisheries Regulatory and Quarantine Division, Bureau of Fisheries and Aquatic Resource Central Office.

¹² Refer to information available from the BFAR Central Office Fisheries Regulatory and Quarantine Division, which is the repository of information on FLAs. The list is dated 12 July 2010.

¹³ http://www.bfar.da.gov.ph/services/CRS_regulatory_svcs/listingoffla.htm.

Based on the website published list, 670 FLAs are already expired.¹⁴ The 12 officially canceled FLAs are among the expired FLAs. The dates of expiry indicated ranged from 1998 to 2010 (Table 13). The average FLA area is 9.42 ha (Table 14); the mode is 5 ha. Before the 1988 CARL was amended in 1995 to exclude public fishponds, many FLA areas were already subdivided into 5-ha lots.

Table 13. Year of Expiration of FLAs in Region VI in the Active List

Province	Expired				To Expire				Total number of FLA and area (ha)
	1995 to 2000	2001 to 2005	2006 to 2010	Total number of FLA and area (ha)*	2011 to 2020	2021 to 2030	2031 to 2040	Total number of FLA and area (ha)	
Aklan	20	73	61	154 1778.78	104	76	0	180 1571.4309	334 3350.2108
Antique	2	2	1	5 150.6566	0	0	0	0	5 150.6466
Capiz	4	27	64	95 953.391	87	38	1	126 791.5599	221 1744.9509
Iloilo	58	92	74	224 2,161.57	111	182	6	299 3067.8244	523 5229.3935
Guimaras	2	18	20	40 364.8499	29	24	0	53 329.9286	93 694.7785
Negros Occidental	45	50	58	153 1,622.41	94	71	7	172 1,514.52	325 3136.9341
Region VI	131	262	278	671 (44.70%) 7,031.65 (49.15%)	425	391	14	830 (55.30%) 7,275.26 (50.85%)	1501 (100.00%) 14,306.91 (100.00%)

*Second figure represents FLA area in hectare; Source of raw data: FLA list downloaded from http://www.bfar.da.gov.ph/services/CRS_regulatory_svcs/listingoffla.htm on 25 July 2010

Table 14. Descriptive Statistics of Fishpond Lease Agreement Areas in Region VI *

	Aklan n=332	Antique n=4	Capiz n=217	Guimaras n=93	Iloilo n=520	Negros Occidental n=323	All N=1489
Mean	9.9557	28.3741	7.6838	7.4707	9.8441	9.6814	9.4204
Min	0.2786	19.1415	0.3300	0.2631	0.2389	0.0767	0.0767
Max	115	50	78.4522	45.3485	254.3571	70.8079	254.3571

*Using raw data from the FLA list published in the website without the 12 FLAs already canceled

Local key informants were asked to verify the current addresses of the lessees. Evidently, “absentee lessees” exist. Results showed that more than half of the 571 lessees in selected LGUs visited for the study were not from the areas where the FLA areas are located (Table 15).

In terms of employment, the FLA areas do not have much impact in the region. Based on the 10 FLA areas visited, there is only one caretaker for every 5-14 ha of

¹⁴If this list is claimed to be not updated, then a decade to within five years from current year is a long time not to update the list that is being made available to the public. A key informant verified that 419 (68%) of 619. FLAs that expired before 2010 were not renewed.

fishpond. In addition, one casual worker is assigned for every 3-7 ha of fishpond (Table 16).

Table 15. Domicile of FLA Holders in Selected Municipalities and Cities

<i>Province/ Municipality/ City</i>	<i>Native</i>	<i>Outside City or Municipality</i>	<i>Outside Province</i>	<i>Outside Region 6</i>	<i>Address not known</i>	<i>Total</i>
Capiz						
Ivisan	10	6	1	5	0	22
Roxas City	10	2	0	1	2	15
Pontevedra	32	20	7	3	0	62
Pres. Roxas	22	3	2	0	0	27
Iloilo						
Ajuy	35	16	2	0	4	57
Btac Viejo	8	4	0	0	0	12
Concepcion	9	7	1	1	0	18
Carles	30	38	6	24	1	99
Jaro, Iloilo City	23	0	0	1		24
Negros Occidental						
Escalante City	19	54	7	3	1	84
Cadiz City	5	21	0	0	0	26
Victorias City	0	1	0	0	1	2
EB Magalona	8	14	0	0	1	23
Silay City	11	11	0	0	0	22
Bacolod City	7	0	0	0	0	7
Bago City	0	6	0	2	2	10
Pontevedra	3	4	0	0	0	7
Total	232	207	26	40	12	517

Source of raw data: BFAR FLA list from BFAR website with supplementary interview with LGU managers (Aquaculture Technician, Agriculture Technician, Supervising Agriculturist/ Aquaculturist, Municipal/City Agriculturist) and barangay officials where FLA area is located. Data from BFAR Central Office (gathered on 27 January 2011), BFAR Negros Occidental Provincial Office (gathered on 18 February 2011), and BFAR Capiz Provincial Office (gathered on 4 March 2011) were used for FLA holders whose addresses cannot be determined by the local people.

Table 16. Employee-to-Pond (ha) Ratio in 10 FLA Areas Visited

<i>Province</i>	<i>No. of FLA</i>	<i>Total area of FLA (ha)</i>	<i>Caretaker to pond ratio</i>	<i>Casual labor* to pond ratio</i>
Capiz	1	11	1:11	1:3
Guimaras	1	17	1:9	1:3
Iloilo	4	126	1:14	1:7
Negros Occidental	4	13.83	1:5	1:2
	10	167.83	1:9	1:4

*Seasonal work like during harvest and major dike repair and maintenance

6.0 CANCELLATION OF FISHPOND LEASE AGREEMENT

The process of cancellation starts with the identification of the FLA for cancellation by BFAR; the final step is the issuance of the Order of Finality by the Department of Agriculture. The process is complicated and long.

6.1 Identifying Fishpond Lease Agreements for Cancellation

In practice, no active identification of areas with FLAs for cancellation has been happening. Based on interviews with key informants and a review of records of canceled FLAs, the identification process can be started in two ways. First, a complaint by an adverse party is filed at BFAR (national, regional, or provincial office). Among the 29 canceled FLAs reviewed, five had an adverse party, which included a local government (represented by the officials) and private individuals. The FLA area under consideration may be a disused one or used by others (other than the original lessee) for production purposes. The second way entails the use of information available at BFAR. Official records can show if lessees have failed to pay rentals for years or to submit the required production reports. In this case, the FLA lessees are issued a notice or letter requiring them to pay their back rentals or submit the semi-annual reports. If no response is received after repeated notices, the cancellation process starts.

6.2 Actual FLA Cancellation Process

The actual process of FLA cancellation has the following steps: ¹⁵

1. BFAR issues a memorandum to conduct an ocular inspection (carried out by the BFAR provincial office).
2. BFAR Regional Director receives the ocular inspection report with recommendation for termination/cancellation and endorses same to BFAR National Director.
3. Lessee is notified in writing of the results of the ocular inspection report and is required to explain why the FLA should not be canceled.
 - If the lessee responds and is able to explain satisfactorily the reasons for noncompliance with terms and conditions, BFAR may consider said reasons and defer recommendation for cancellation/termination.
 - If the lessee does not respond within the time allotted, BFAR will consider this as a waiver on the lessee's part to protect his/her interest in the area and shall recommend to DA the cancellation/termination of the lease.
4. BFAR informs the Regional Office concerned of the finality of the cancellation order, with instruction to coordinate with concerned agencies for the tripartite determination whether the area or portion thereof is still suitable for fishpond development or whether the area should be reverted to DENR jurisdiction per Sec. 49 of RA 8550.
 - If the Order is for reversion of the area, BFAR furnishes DENR a copy of the cancellation order and the survey plan of the area.
5. BFAR recommends to DA the cancellation/termination of the FLA.
6. DA issues the Notice of Cancellation or Order Canceling the FLA; the lessee is sent a copy of the Notice/Order.
7. DA issues the Order of Finality of the cancellation order and returns the records of the FLA to BFAR.

A review of the records of canceled FLAs shows that not all steps are rigidly followed. For one, Step 4, which involves "tripartite determination," is not observed.

¹⁵ Shared by the same BFAR personnel during the Visayas (28-30 July 2010) and Mindanao (3-4 March 2011) consultations on FLA cancellation and mangrove reversion.

6.3 Canceled FLAs in Region VI

Official records from BFAR-FRQD indicate that there are 63 canceled FLAs in Region VI, covering a total area of 1,330.919 ha (Table 17). Of these, only 21 FLAs (477.75 ha, 36%) had been reverted to DENR at the time of data collection. Three FLA areas (11.9428 ha) were identified as “abandoned” and eight (209.28 ha) as undeveloped. These areas are spread all over the region (Figure 3).

The province of Negros Occidental registered the highest number of canceled FLAs, with more than half (17 of 29) already reverted to DENR. Three abandoned FLA areas are also in Negros Occidental. Iloilo Province comes next with 14 canceled FLAs (the areas covered by two of these have been reverted to DENR) and 3 abandoned FLA areas. Capiz is third with 11 canceled FLAs whose covered areas had not been reverted to DENR and 3 undeveloped FLA areas.

In terms of total area, Iloilo has the largest at 272.47 ha for the 12 FLA areas not reverted to DENR, 345.24 ha for the 2 FLA areas reverted to DENR, and 62.32 ha for the 2 undeveloped areas. The 11 FLA areas in Capiz reverted to DENR cover 352.86 ha, while the three undeveloped areas cover 70 ha.

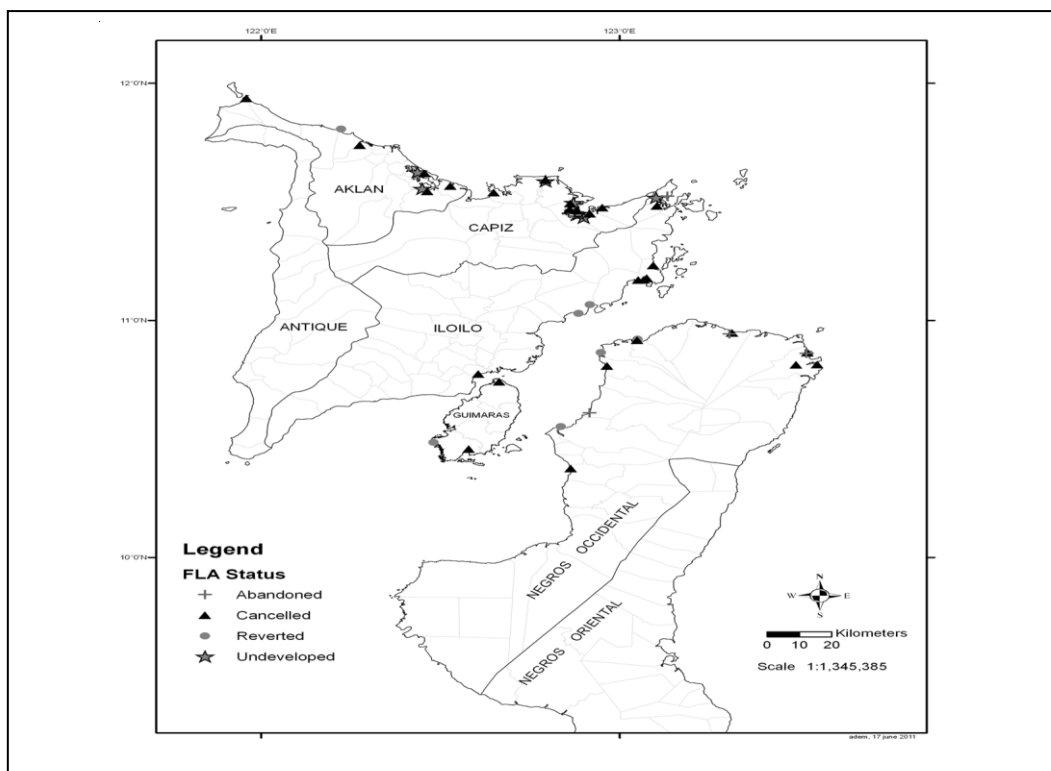


Figure 3. Distribution of Disused FLA Areas in Region VI

6.3.1 Area Granted and Length of Time FLA was Enforced

The average area covered by the 21 canceled FLAs reverted to DENR is 22.71 ha. This is about 2 ha larger than the area with canceled FLAs not reverted to DENR (20.31 ha) and about 4 times that of abandoned FLA areas (3.98 ha). The average of undeveloped FLA areas is largest at 26.26 ha. On average, the FLAs were canceled after about 14 years from the date of approval, with a range of about 7-17 years (the mode is more than 10 years).

Table 17. Area Granted and Length of Years of FLA Enforcement

	<i>Canceled FLAs with areas reverted to DENR</i>		<i>Canceled FLAs with areas not reverted to DENR</i>		<i>Abandoned</i>		<i>Undeveloped</i>		<i>ALL</i>	
	<i>no.</i>	<i>Area (ha)</i>	<i>no.</i>	<i>Area (ha)</i>	<i>no.</i>	<i>Area (ha)</i>	<i>no.</i>	<i>Area (ha)</i>	<i>no.</i>	<i>Area (ha)</i>
Aklan	1	24.0722	5	124.8061	0	0.00	2	39.8064	8	188.6847
Antique	0	0.00	0	0.00	0	0.00	1	37.1504	1	37.1504
Capiz	0	0.00	11	352.8551	0	0.00	3	70.00	14	422.8551
Guimaras	1	12.7636	2	21.72	0	0.00	0	0.00	3	34.4836
Iloilo	2	345.2433	12	272.4735	0	0.00	2	62.3267	16	680.0435
Negros Occ	17	95.6709	12	81.3077	3	11.9428	0	0.00	32	188.9214
Region VI	21	477.7500	42	853.1624	3	11.9428	8	209.2835	74	1,552.1387

Source of Raw Data: Record Section, FRQD, BFAR Central Office

Note: Canceled FLAs with areas not reverted to DENR - out of 42, 31 folders were accessed, 11 FLA folders were in the Department of Agriculture main office during data collection

6.4 Grounds for Cancellation of FLA in Region VI

In the region, the most popular reason for FLA cancellation is failure to pay rental fees. This is true regardless of whether or not the area was reverted (95%) or not (89%) to DENR after FLA cancellation (Table 18 and 19).

Table 18. Grounds for Cancellation of Canceled FLAs with Areas Not Reverted to DENR

<i>Grounds for Cancellation</i>	<i>Province in Region VI</i>					<i>Total N=38*</i>
	<i>Aklan n=4</i>	<i>Capiz n=10</i>	<i>Gui- maras n=2</i>	<i>Iloilo n=12</i>	<i>Negros Occ. n=10</i>	
Failure to pay accumulated arrears on rentals and surcharges due	4	10	2	10	7	33 (86.84)
Failure to submit the required reports on the development, operation, and production of the fishpond area	4	3	1	11	8	27 (71.05)
Failure to develop the area into productive fishpond/devoid of development or improvement	1	9	2	10	2	24 (63.16)
Area is undeveloped and abandoned/ totally abandoned by the lessee	3	1	-	2	3	9 (23.68)
Area is vegetated with mangroves	-	1	-	-	5	6 (15.78)
Area is not viable nor suitable for fishpond purposes	-	-	-	-	4	4 (10.53)
Failure to respond to the Notice of Cancellation	-	1	-	-	3	4 (10.53)
With request for termination of FLA	-	-	-	-	2	2 (5.26)
FLA has expired	-	-	-	-	2	2 (5.26)
The lessee is already permanently residing abroad	-	-	-	-	1	1 (2.63)
Falsification of documents	1	-	-	-	-	1 (2.63)
The area was declared as Tourism Zone under the administration and control of the Philippine Tourism Authority	1	-	-	-	-	1 (2.63)

Source of raw data: Copy of Memorandum and Cancellation Order available in individual FLA folders, Records Section, FRQD, BFAR Central Office and list of canceled FLAs from BFAR 6 Regional Office

*Out of 42 canceled FLAs, 38 have information. Aklan - out of 5 FLAs, only 4 have data, 1 folder is in the Department of Agriculture (DA) Main Office, Capiz- out of 11 FLAs, 10 have data Negros Occidental- out of 12 FLAs, only 10 have data, 2 folders are in DA; Figures in parenthesis are % of the total number.

Table 19. Grounds for Cancellation of Currently Canceled FLAs with Areas that were Reverted to DENR

<i>Grounds for Cancellation</i>	<i>Province in Region VI*</i>				<i>Total N=21</i>
	<i>Aklan n=1</i>	<i>Gui- maras n=1</i>	<i>Iloilo n=2</i>	<i>Negros Occ. n=17</i>	
Failure to pay accumulated arrears on rentals and surcharges due the area	1	1	2	16	20 (95.24)
Failure to submit the required reports on the development, operation, and production of the fishpond area	-	1	1	16	18 (85.71)
Area is devoid of improvements/abandoned	-	-	1	13	14 (66.67)
Area is not viable nor suitable for fishpond purposes	-	-	-	14	14 (66.67)
Failure to respond to the Notice of Cancellation	-	-	-	12	12 (57.71)
Area is undeveloped/abandoned and fully vegetated with mangroves	-	-	1	3	4 (19.04)
The lessee has requested the cancellation/termination or poses no objection to cancellation of FLA due to financial reason	-	-	2	1	3 (14.29)
Area has been totally abandoned	-	1	-	-	1 (4.76)
Area is subject of resolution of LGU and requested for FLA cancellation	-	-	-	1	1 (4.76)

Source of raw data: Copy of Memorandum of Cancellation available in individual FLA folders, Records Section, FRQD, BFAR Central Office; *Capiz and Antique have no canceled FLA reverted to DENR.

Figures in parenthesis are % of the total number.

Moreover, particular to FLAs whose areas were not yet reverted to DENR, the popular reasons for cancellation include failure to submit the yearly report and to develop the area. On the other hand, some areas were reported to be in the subtidal zones, which are not suitable for fishpond purposes and, thus, abandoned by lessees. Meanwhile, among the areas with canceled FLAs and reverted to DENR, two-thirds were described to be “devoid of improvements/abandoned” and “neither viable nor suitable for fishpond purposes.”

6.5 More FLAs Should Have Been Canceled

More FLAs should have been canceled or be in the process of cancellation for several reasons. First, many lessees fail to regularly pay their dues, hence, lease collection is lower than what should be. Table 20 shows the collection of FLA rentals in Region VI from 2006 to 2010. According to records, there are 1,487 FLAs covering 14,253.1861 ha in the region. At the rate of Php 1,000/ha, the expected total yearly collection is Php 14,253,186.10. The amounts collected through the years have been falling below the expected level, even with inclusion of surcharges and back rentals.

Table 20. FLA Rental Collection in Region VI

<i>Year</i>	<i>Amount in Pesos</i>	<i>(in USD)</i>
2006	11,833,315.95	(273,286.74)
2007	13,301,102.38	(307,184.81)
2008	10,096,406.92	(233,173.37)
2009	8,911,218.74	(205,801.82)
2010	9,754,522.30	(225,277.65)
Total	53,896,566.29	(1,244,724.39)

Source: Official communication from BFAR VI to the project leader, dated 6 January 2011;
PhP 43.3: USD 1

Second, the records of the 37 randomly picked active FLAs show noncompliance of two requirements: regular payments and submissions of reports. Table 21 shows that in addition to 11 FLA lessees failing to make regular payments of lease (between 2 and 10 years), 16 have failed to regularly submit production records (between 2 and 16 years).

Table 21. Failure to Submit Yearly Reports and Pay FLA Rentals for Two Consecutive Years among the 37 Active FLAs

<i>Province</i>	<i>No. of active FLAs</i>	<i>No. who failed to pay rentals and surcharges for 2 consecutive years</i>				<i>No. who failed to submit the yearly production report</i>				
		<i>2-3 years</i>	<i>4-5 years</i>	<i>6-8 years</i>	<i>9-10 years</i>	<i>2- 4 years</i>	<i>5 - 7 years</i>	<i>8 - 10 years</i>	<i>11-13 years</i>	<i>14-16 years</i>
Aklan	5	3	0	0	0	0	0	2	1	2
Antique	4	2	0	0	0	2	0	0	0	0
Capiz	6	0	0	0	0	0	0	0	0	0
Guimaras	6	0	0	4	1	0	1	4	0	1
Iloilo	9	0	0	0	0	0	1	0	0	0
Negros Occ	7	0	0	0	1	0	0	0	1	1
Region VI	37	5	0	4	2	2	2	6	2	4

Source of raw data: 37 randomly picked FLA folders in Region VI filed at the Records Section, BFAR Central Office, Quezon City.

Third, interviews with agriculture and fisheries technicians in 17 selected LGUs in the four provinces in the region showed that a number of FLA areas in their jurisdiction are still in the active list of BFAR although they are no longer being actively used for production purposes or have been already abandoned or are undeveloped. When showed a list of FLA areas with the names of lessees and address of fishponds, the technicians identified the areas that are no longer operating as fishponds for more than two years or have been abandoned. The results are presented in Table 22.

Fourth, the number of expired FLAs is sizeable (Section 5.1). Four in every 10 FLAs in the active list have already expired, some as long as more than a decade ago.

Table 22. List of Active and Not Operational/Abandoned FLA Areas according to Agriculture and Fisheries Personnel in Selected Municipalities and Cities

Province/Municipality/ City	Abandoned/ not operational		Still Active for fishpond purposes	Don't know/not sure	Total FLA areas
	No. of FLA	Total Area (ha)			
Capiz					
Ivisan	3	54.13	17	2	22
Roxas City	0	0.00	4	10	14
Pontevedra	1	5.00	35	26	62
Pres Roxas	0	0.00	22	5	27
Iloilo					
Ajuy	1	3.30	32	24	57
Btac Viejo	0	0.00	10	1	11
Concepcion	3	23.16	13	2	18
Carles	1	25.29	34	62	97
Jaro, Iloilo City	0	0.00	3	21	24
Negros Occidental					
Escalante City	0	0.00	61	23	84
Cadiz City	0	0.00	25	1	26
Victorias City	0	0.00	1	1	2
E. B. Magalona	5	24.77	11	7	23
Silay City	0	0.00	7	15	22
Bacolod City	4	17.88	0	2	6
Bago City	0	0.00	0	8	8
Pontevedra	0	0.00	7	0	7
Total	18	153.53	282	210	510

Using the FLA list from BFAR's website, the respective LGUs' Aquaculture Technicians, Agriculture Technicians, Supervising Agriculturists/Aquaculturists, Municipal/City Agriculturists or barangay officials were asked from October 2010 to January 2011 to determine if FLA fishponds in the list were active or not operational.

Fifth, subleasing is rampant. For instance, one interviewee was subleasing his 11-ha FLA area for PhP 100,000/year for 7 years from a municipal employee who is the wife of a local politician. The sublessee was candid in admitting that the fishpond is an FLA area granted to another person. This case is popularly known in the area.

In many instances, the lessee and the sublessee make it appear that they are "partners." That is, the FLA lessee partners with a person who finances the development of the fishpond. Although it is a form of subleasing, it is difficult to obtain evidence to prove it. In another area visited with a canceled FLA, the person in possession of the area was subleasing for three years from the original lessee. The person in operation was actually the second sublessee identified.

Further, many lessees fail to comply with the obligation to introduce improvements in the FLA area within 180 days from the date of issuance of the lease. For instance, two FLAs in Bago City, Negros Occidental were canceled and the areas were reverted to DENR after 17 years of no developments made by the lessees. In one area visited in Bacolod City, the lessee had just started to develop the FLA area awarded to him five years ago. The current development got dubbed as "mangrove forest massacre". The lessee is reported to have "ordered workmen to uproot using backhoes the mangrove trees to give way to a fishpond he is building in that place."¹⁶

¹⁶ From <http://www.ndb-online.com/sep2110/negros-events-news/Mangrove+Forest+Massacre+Continues+Without+Let-Up> on 21 September 2010. It was reported that the lessee 'insists that the Fishpond Lease Agreement (FLA), issued to him by the Bureau of Fisheries and Aquatic Resources (BFAR), supersedes the effectuality of any law.'

6.6 Possible Reasons for the Low Rate of Cancellation of FLA

Region VI has the highest number of canceled FLAs in the country. However, this number is actually lower than what it should be due to a number of reasons.

6.6.1 No approved guidelines on FLA cancellation

There are no approved guidelines on FLA cancellation. BFAR follows a practice (Section 6.2) based on FAO 197.¹⁷ Without the approved guidelines, the steps taken and the length of time involved differ for every case. For instance, from among the 29 canceled FLAs reviewed, the length of time involved in cancellation varied from 0.58 to 14 years (Table 23) .

Table 23. Estimated Length of Time Involved in Canceling FLAs

<i>Province</i>	<i>Average number of years</i>
Aklan (<i>n</i> =2)	1.29
Capiz (<i>n</i> =7)	5.57
Guimaras (<i>n</i> =2)	1.50
Iloilo (<i>n</i> =8)	2.86
Negros Occidental (<i>n</i> =10)	3.30
Min= 0.58 years ; Max= 14 years	

Source: Based on available documents in the individual FLA folders available at FRQD, BFAR Central Office. This is for the FLAs that were canceled and not reverted to DENR.
Note: Aklan - out of 5 FLAS, 2 have data; Capiz - out of 11, 7 have data; Iloilo - out of 12, 8 have data; Negros Occidental -out of 12, 10 have data

During the Visayas and Mindanao consultations on FLA reversion, the participants suggested some revisions to the cancellation process. The common element is the reduction in the length of time to complete the process. A recommended guideline drawn up during the Visayas consultation prescribed 212 days to finish the cancellation process.

6.6.2. Power of connections

BFAR recommends an FLA cancellation and the DA Secretary makes the final decision. Lessees can still appeal at the department level. The key informants indicated that the more “powerful and connected” the lessee is, the higher the probability that his/her FLA will not be canceled. At the time of study, 11 FLAs recorded as canceled at BFAR were learned to be still pending final decision at the department level.

6.6.3. The untouchables

Many FLA lessees are politicians (current and past), businessmen, or rich people. Considered “untouchable,” they are “risky” to deal with, even if they clearly violate the terms of contract. Often, their FLA areas are fenced. Local people also reported that these FLAs are guarded by armed caretakers.

¹⁷ The information was shared by BFAR personnel during the Seminar-Workshop on FLA Cancellation and Mangrove Reversion, 28-30 July 2010. The same topic was raised during the Mindanao Consultation on the Reversion of AUU to Mangrove Forest, 3-4 March 2011.

6.6.4. Poor monitoring and recording

FLA areas in the region are not regularly monitored. According to a key informant, ocular inspections of fishponds are done only when there is a need for inspection, such as during renewal of lease and transfer of rights or when the BFAR Central Office sends a memorandum to inspect a particular FLA fishpond. Communications, usually reminders for rentals, between the Regional Office and the lessees are through registered mail. Moreover, records of each FLA area are done manually and documents are kept in folders. There is no computerized database to hasten monitoring or report generation.

6.6.5. Limited resources

Human resources for work related to FLA are limited. At the national level, BFAR has only three staff members assigned to FLA related work. Moreover, FLA is just one of the many programs and concerns they have to attend to. Similarly, the regional office, where the responsibility of identifying FLAs for cancellation rests, has only two personnel dedicated to 1,487 FLA areas covering 14,253.17 ha in six provinces. With limited travel budget, they are constrained to a maximum of four field visits in a month. BFAR relies on Provincial Fisheries Officers (PFOs) for field support, but the PFOs also look after other fisheries programs. The PFOs are backed usually by two staff members hired on contractual basis.

7.0 REVERSION OF JURISDICTION OVER DISUSED FISHPOND LEASE AGREEMENT AREAS TO THE DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

7.1 Legal Instruments on Reversion of Disused FLA Areas

DENR is mainly responsible for restoring disused FLA areas into mangrove forests. The DA-DENR Joint Memorandum Order No. 3, Series of 1991, provides that "all abandoned/idle/unutilized fishponds covered by (FLAs) are to be canceled by DA's Bureau of Fisheries and Aquatic Resources (BFAR) and recommend to DENR for reversion to timberland or rehabilitation." Section 49 of the 1998 Fisheries Code states that, "DENR, in coordination with the Department (of Agriculture), LGUs and other concerned agencies and FAMRCs shall determine which abandoned, underdeveloped or underutilized fishponds covered by FLAs can be reverted to their original mangrove state and after having made such determination shall take all steps necessary to restore such areas in their original mangrove state." Section 24 of the 2000 FAO 197 also states that "Fishpond areas covered by an existing FLA which have been determined jointly by DA, DENR and LGUs concerned as abandoned, undeveloped or underutilized portions after five (5) years from the issuance of the FLA can be reverted to their original mangrove state and that necessary steps should be made to restore such areas to their original mangrove state." Further, the Joint Administration Order 2008 (Section 14) states that "another TWG shall be created to be chaired by DENR with members from DA/BFAR, LGUs concerned and FARMCs to identify FLA areas which have been abandoned for five (5) years from the start of approval of the lease contract. These areas, upon proper notice to respective lease holders, shall automatically revert to the mass of public domain for eventual reforestation under DENR Administration. This

inter-agency technical working group shall prepare guidelines for the reversion of identified abandoned, underutilized and undeveloped FLA areas that can be reverted to their original mangrove state.”

7.2 After the Order of FLA Cancellation

Once an FLA is canceled, jurisdiction over its area covered does not automatically return to DENR from DA-BFAR. The law requires that only those that are AUU are to be reverted ‘automatically’ to DENR. Based on copies of cancellation orders available in the individual FLA folders for 26 out of 42 canceled FLAs with areas not reverted to DENR, 11 were declared open and available to any interested applicant without prejudice to the findings of BFAR if the area is still suitable for fishpond purposes upon determination by BFAR (Table 24). Eight were just “canceled”, two were ordered “canceled and to be returned to DENR,” and one was canceled but final termination is to be decided after the tripartite inspection.

The official summary list of the status of the 42 canceled FLAs with areas not reverted to DENR indicates that 17 were for “verification if still suitable for fishpond purposes” and eight were identified as “vegetated with mangroves.” Others were identified as “awarded to new lessee”, “vacant and open to new application”, or “subject of application” (Table 25).

Table 24. Text in the Order of Cancellation of the FLAs Based on the Memorandum for Cancellation

<i>Cancellation Order</i>	<i>Aklan n= 2</i>	<i>Capiz n=6</i>	<i>Guimaras n=2</i>	<i>Iloilo n=7</i>	<i>Negros Occ n=9</i>	<i>Region VI N=26</i>
Declared open and available to any qualified and interested applicant	2	5	1	2	1	11
Canceled for violation of the terms and conditions of the lease	-	1	1	1	5	8
Canceled, BFAR is directed to cause the conduct of a tripartite ocular inspection and verification of the fishpond area to determine whether the area is still suitable for fishpond purposes	-	-	-	4	-	4
Canceled and reverted to DENR*	-	-	-	-	2	2
Canceled and terminated, BFARs recommendation to officially terminate FLA is granted only after a tripartite ocular inspection by DENR, BFAR and LGU	-	-	-	-	1	1

Source: FLA Folders, Record Section, FRQD, BFAR

Note: Out of 42 canceled FLAs, only 26 have complete copies of cancellation orders in their folders. Aklan- 2 FLA folders are in DA, 1 FLA folder (former lessee in the list) is not traceable; Iloilo- 3 FLA folders are in DA, 1 FLA cancellation order is not complete, 1 FLA folder has no cancellation order; Capiz- 3 FLA folders are in DA, 1 FLA cancellation order is not complete, 1 FLA has no cancellation order; Negros- 3 FLA folders are in DA, * however, 2 FLAs are not in the official list of reverted FLAs.

It is noted that three canceled FLAs areas were identified to be with the Philippine Tourism Authority, the Development Bank of the Philippines (FLAs were once used as collateral for bank loans), and with a local government unit. Two of these areas were found no longer suitable for mangrove reforestation during the field visit.

7.3 More Areas with Canceled FLAs should have been Reverted

Based on Section 7.2 and Tables 22 and 23 (in Section 6), the number of reverted FLA areas (currently 21) is fewer than what it should be. In Table 17, three FLA areas were identified as “abandoned” and eight were “undeveloped.” In Table 18, the areas covered by at least 24 canceled FLAs should have been reverted to DENR due to being “devoid of any development or improvement.” Table 25 shows that eight FLA areas were already identified as vegetated with mangroves and three as having no developments introduced.

Table 25. “Status” Remark on the Areas with Canceled FLAs but Not Reverted to DENR

Remarks	<i>Aklan</i> n= 5	<i>Capiz</i> n=11	<i>Guimaras</i> n=2	<i>Iloilo</i> n=12	<i>Negros Occ</i> n=12	<i>Region VI</i> N=42
For verification if still suitable for fishpond purposes; tripartite verification	2	9**	-	5*	1**	17
Vegetated with mangroves	-	-	2***	-	6	8
No development introduced	-	-	-	2	1	3
Awarded to new lessee	2	-	-	-	-	2
Vacant and open to other applicant	-	-	-	-	2	2
Subject of application	-	1	-	-	-	1
No longer suitable for fishpond purposes; part of Cabugao Bay	-	1	-	-	-	1
Assigned with DBP; no development introduced	-	-	-	1	-	1
Placed under PTA jurisdiction pursuant to PD 564	1	-	-	-	-	1
Proposed for expansion for LGU facilities	-	-	-	-	1	1

Note: PTA- Philippine Tourism Authority; DBP – Development Bank of the Philippines

*1 has a note - “no cancellation order”; **has a note “for reversion to DENR”; ***1 has a note - “assigned with DBP”; 1 has a note - “reverted to DENR”

Moreover, there were questionable FLA areas in terms of status. First, the jurisdiction over the FLA areas identified as abandoned and undeveloped was not reverted to DENR, according to information available in the original FLA folders. In the summary list, remarks for the abandoned FLA areas include “recommended for cancellation” while the remark for undeveloped FLA areas is “for verification if still suitable for fishpond purposes.” Based on FAO 197 Section 13, “all areas not fully producing within five (5) years from the date of approval of the lease shall automatically revert to the public domain for reforestation.” Section 24 states that “underutilized portions after five (5) years from the issuance of the FLA can be reverted to their original mangrove state and that necessary steps should be made to restore such areas to their original mangrove state.”

Given the above, the minimum number of reverted FLA areas should have been 56. These include the 21 FLAs already identified as canceled and whose areas have been reverted to DENR and the 35 (at the minimum) that are qualified for reversion. The 35 include 24 of the 42 canceled FLAs whose areas have not been reverted to DENR, three identified as abandoned, and eight as undeveloped.

7.4 Issues and Problems of FLA Area Reversion

There are institutional, political, and economic issues related to reversion of disused FLA areas. Below are possible explanations for the lower number of reversion to DENR of areas of canceled FLAs than what should be.

7.4.1 Absence of approved guidelines on disused FLA areas reversion

Just as there are no approved rules and guidelines for FLA cancellation, there are also no approved rules and guidelines on the process of FLA area reversion to mangrove forest. Section 14 of the Joint DA-DENR-DILG Administrative Order No. 1, Series of 2008 (31 January 2008), provides for the creation of an inter-agency technical working group to be chaired by DENR and with members from DA-BFAR, LGUs concerned, and FARMCs to identify FLA areas that have been abandoned for five years from the date of approval of the lease contract. These areas, upon proper notice, shall automatically revert to public domain for eventual reforestation under the administration of DENR. This inter-agency technical working group is also tasked to develop and prepare guidelines for the reversion of identified abandoned, underutilized, and undeveloped areas covered by FLAs that can be reverted to their original mangrove state. Unfortunately, no tripartite collaboration has been created so far.

During the two consultations on the AUU FLA areas' reversion to mangrove forests in the Visayas (July 2010) and Mindanao (March 2011), attempts were made to come up with rules and timeline on the reversion process. In the Mindanao consultation, the recommended reversion process takes only 25 days from the time the DA Secretary signs the cancellation order and turns over the jurisdiction over an FLA area to DENR then to concerned regional offices and the specific units responsible such as the FMS/PAWS-CMMS. Earlier, the NGOs for Fisheries Reform came up with a "Draft Joint DA-DENR-DILG Rules on Reversion of Abandoned, Underdeveloped or Underutilized Fishponds" dated 23 June 2010.

7.4.2 No approved definition of "abandoned" and "underutilized" fishponds

There is a lack of approved definitions for "abandoned" FLA areas and "underutilized" fishponds. A definition of "undeveloped" fishpond is found in Section 1.12 of FAO 197 and Section 46 of RA 8550. During the March 2011 Mindanao consultation on the reversion of AUU to mangroves, definitions of AUU were drafted (Table 26). Similarly, the NGOs for Fisheries Reform developed a definition of AUU.

Table 26. Suggested Definitions of Abandoned, Undeveloped, and Underutilized Fishpond

	<i>Mindanao Consultation on AUU reversion to mangrove (3-4 March 2011)</i>	<i>NGOs for Fisheries Reform (23 June 2010)</i>
Abandoned	No existence of possession/occupation and any operational activities by the lessee or of any of his/her lawful representative.	Absence of any management scheme by the holder of the Fishpond Lease Agreement (FLA).
Undeveloped	(Adopted from Section 1.12 of FAO No. 197) Areas not enclosed by dikes; or enclosed by dikes without functional water control structures but the water level required for production on a commercial scale cannot be maintained either by high tides or by pumping; or a larger area enclosed only with a simple perimeter dike that has not been subdivided, which may or may not be vegetated with mangrove species and is not producing on a commercial scale.	An FLA area where there is a failure of its holder to meet for three consecutive years at least 75% of the targets set in the approved development and management plan due to causes within the control of the FLA holder.
Underutilized	Area not fully producing within 5 years from the date of approval of the lease contract.	An FLA area where there is a failure of the FLA holder to meet for three consecutive years at least 75% of the production target set in the approved annual.

7.4.3. Absence of collaboration between DA-BFAR and DENR

No formal collaboration and coordination exist between the two main agencies of the government in charge of the FLA (BFAR) and the mangroves (DENR) despite the presence of orders to do so. This is true on all levels: national, regional, and local. Moreover, in the cancellation orders for FLAs signed by the DA Undersecretary for Fisheries and Livestock, DENR is not in the list furnished with a copy (copies are provided to the lessee, Director of BFAR Regional office, Director of BFAR main office, and Chief Legal Division of DA).

Key informants mentioned that at the regional level, the DENR regional office communicated with BFAR in 2002 to set up a meeting to discuss collaboration as prescribed by the FAO 197. A follow up communication on the matter was made in 2004, but no meeting has happened until now.

7.4.4 Advantages of retaining the FLA areas with BFAR

To the key informants, there are good reasons to recommend to the DA Secretary the cancellation only of the FLAs – that is, the FLA areas remain open for applications or continue to stay under BFAR’s jurisdiction. The popular view is that there are sectors in BFAR wanting to retain FLA areas under BFAR jurisdiction even if these are qualified to be returned to DENR. The key informants believe BFAR “holds on to FLA” because “the more FLAs, the more power” and “FLAs are a money making machine.” Money refers to the legal fees and rentals and also to “under the table” payments.

Meanwhile, DENR is not seen as credible in keeping FLA areas under its management or reverting them to their original mangrove state. One key informant suggested that it is better to just leave the FLA in canceled status without reverting the

area to DENR, which will “just convert it to other uses.” The tenurial instruments available at DENR are considered “threats.” The key informant believes that if an FLA area is suitable for mangrove forest, it will regenerate naturally.

The fear that the disused area will be converted by DENR to other uses is not without basis. A key informant from DENR affirms this, pointing to “political influences” as reason for this conversion. A case in point is the application for FLA on an FLA area that was reverted already to DENR. One applicant was able to secure certification that DENR poses no objection to fishpond development. Although in this instance, the actions of both agencies are questionable (BFAR for entertaining new applicants despite the previous ruling of reverting it to DENR and DENR for issuing a certificate), it highlights that, indeed, the status of an FLA area even when already reverted to DENR can be changed.

7.4.5 Non-action of DENR

A key informant from DENR disclosed that the department has done “nothing” with regard to reversion of AUU FLA areas.¹⁸ Another key informant described the entire reversion process as “zero governance”.

Still another DENR key informant said there are no records of reverted FLA areas available at DENR Central Office. This was echoed by a key informant at the regional level. However, this is only partly true. In August 2008, the BFAR Director sent a memo to DENR stating that BFAR is providing DENR a “list of areas covered by Fishpond Lease Agreements which have been canceled for cause and reverted to the jurisdiction of that Department, including copies of the Orders canceling the same and the survey plans thereof.” A memo dated 1 September 2008 from the DENR Undersecretary for Staff Bureaus stated that the memo of the BFAR Director was referred to the Director of the Forest Management Bureau (FMB), who was directed to “look into the matter and take appropriate actions thereon in accordance with existing laws, rules and regulations.” The Undersecretary also sent an acknowledgment receipt to the BFAR Director where the reference to the Director of the FMB was also stated.

Within DENR, it is not clear which unit has the responsibility over reverted FLA areas. The confusion possibly stems from the fact that at the national level, there are two units involved in mangroves: the Coastal and Marine Management Office (CMMO) and the FMB. Mangroves are forests found in coastal areas. This unique characteristic of mangroves is the source of confusion. As noted by a key informant, DENR is “forestry” dominated. When CMMO was established in 2002, mangrove management was delegated to this office. In discussions on mangrove reversion, CMMO is at the frontline and not FMB.

Meanwhile, given that the directive to act on the list of FLA areas already reverted to DENR was back in 2008 and that nothing has been done to these FLA areas, indeed it is fair to say that DENR has done nothing on the disused FLA areas reverted to it.

During the Mindanao consultation on AUU FLA areas’ reversion to mangrove forests, where representatives from five regions attended, different interpretations of terms and of policies and laws surfaced. It was also pointed out that the national office and the regional offices do not have the same interpretation of laws, rules, and guidelines.

¹⁸ It should be noted the DENR-CMMO (main office) was the partner of NFR and other stakeholder groups in organizing consultations on AUU reversion to mangroves in Luzon and Mindanao.

Moreover, one key informant pointed to a weakness of DENR in that it does not have an “outcome based monitoring;” instead, it has adopted the “output based monitoring” approach. As such, the concern is on the planting and not on the survival of mangroves. Moreover, rehabilitating or reforesting the reverted areas requires large budgets, which DENR does not have.

8. SUITABILITY OF DISUSED FISHPOND LEASE AGREEMENT AREAS FOR REFORESTATION

8.1 Need for Assessment

Not all disused FLA areas qualify for reversion to their original mangrove state. It is possible that the area is already vegetated with mangrove or severely altered because of backfilling or excavation. According to Lewis (2001), successful ecological restoration requires that before planting of mangroves, normal hydrology must be restored by construction of tidal creeks and intertidal wetland platforms frequently inundated by tidal waters. Yao (2000) reported that the Bohol experience on reversion of abandoned FLA areas to mangrove was difficult because of legal technicalities. About one-third of the FLA areas had been abandoned or remained undeveloped because of lack of capital and technology. Some of the abandoned FLA areas were mortgaged and had been foreclosed by banks.¹⁹

8.2 Current Condition of Visited Disused FLA Areas

Table 27 shows the current condition of the 62 disused FLA areas (covering 1,239 ha) that were visited in four provinces in Region VI. Three FLA areas (1 in Iloilo and 2 in Capiz) were not located. Altogether, about 82% of the visited FLA areas were inundated, about 10% were vegetated with mangroves, about 5% were still being used as fishponds despite the cancellation order, a small portion (1.29%) is part of a river, and nearly 1% have squatters or have become a filled area (thus, severely altered).

Some FLA areas were submerged in more than 1.5 m of water most of the time or exposed to rapid currents or storm surges. These areas, considered as “graveyards” for mangroves, are located in the foreshore area or low intertidal zones. Included here are disused FLA areas that were not really suitable for fishpond purposes in the first place. Originally, they were part of a water body (sea, bay, or river). Lessees had attempted to construct dikes using filling materials from land properties adjacent to the area. When this proved to be costly or due to lack of diking materials, the areas were abandoned. In a number of FLA areas, the remains of the dikes were still visible. Community protests have been filed against lessees who tried to reclaim water bodies. That is, these FLA areas were not originally mangrove areas.

Common also were FLA areas identified to be part of a river (particularly in Capiz). In one disused FLA area, had the original plan of the lessee been implemented, a portion of the pond would have been connected to the opposite river bank, thereby

¹⁹ One significant feature of the FLA in the past is that it was used as loan collateral. After the Philippine independence in 1945, FLAs were accepted as collateral in securing loans from the Rehabilitation and Finance Corporation (now called Development Bank of the Philippines) to facilitate fishpond development (Hishamunda et al. 2009). This practice was stopped in 1987.

closing the river. The lessee had to abandon the plan due to lack of diking materials and strong protest of the community, particularly the fishers who use the river as fishing ground.

Meanwhile, some FLA areas were originally mangrove areas. After they were abandoned, the areas became naturally vegetated with mangroves. However, others are now underwater because of sea level rise. In one FLA area, the old concrete dikes could be seen about 100 meters from the shoreline during low tide. Local residents recalled that the shoreline 20 years ago was beyond these old dikes.

Disused FLA areas were also found in inundated areas (sea and bay) in the middle intertidal zone. These areas, which face the sea, river, or bay, are optimal for reversion to mangrove forest.

Meanwhile, most portions, if not all, of areas with canceled FLAs were still being used as fishponds by the lessees or by sublessees. Both situations are violations to BFAR's guidelines on FLAs. These areas were not fully developed; some ponds or areas were not used for production. In one disused FLA area, several ponds were converted to rice paddies. In another area, the ponds were converted to salt beds during summer.

Table 27. Current Condition of Disused FLA Areas in Region VI

<i>Province and number of FLA areas visited</i>	<i>Total area of visited FLA areas (ha)</i>	<i>Area used for fishpond purposes (ha)</i>	<i>Area vegetated with mangroves (ha)</i>	<i>Inundated area (sea, bay) (ha)</i>	<i>Area is part of river (ha)</i>	<i>Underdeveloped fishpond area (ha)</i>	<i>Hill, filled area, housing area (ha)</i>
Negros Occ. (32)	188.92	49.21	48.28	67.16	2.07	13.88	7.99
Iloilo (15)	640.24**	0.00	59.70	580.53	0.00	0.00	0.00
Guimaras (3)	34.49	0.00	4.00	24.15	6.34	0.00	0.00
Capiz (12)	376.28***	11.00	9.29	348.43	7.56	0.00	0.00
All (62)	1,239.93 (100.00%)	60.21 (4.46%)	121.27 (9.78%)	1,020.27 (82.28%)	15.97 (1.29%)	13.88 (1.12%)	7.99 (0.64%)

*4 ha were converted into a salt bed during summer; **excluding 1 FLA area (39.8105 ha) that was not visited as its exact location was not found; *** excluding 2 FLAs areas (46.5746 ha) that were not located. Note: areas in hectares are estimates.

Other observations are:

- A portion of one FLA area was illegally converted to a fishpond by 15 local residents. Prior to this, the area was vegetated with mature mangroves.
- Another FLA area was severely altered because of backfilling. It was no longer suitable for any reforestation efforts. The identified lessee continues to be in control of the area. A caretaker wards off possible encroachers.
- One disused FLA area that is naturally vegetated with mangroves has about 33 houses constructed along the remnants of the concrete dikes of the fishpond. The *Punong Barangay* (village chief) allowed the construction of the houses for reason that these households serve as guardians of the mangroves against illegal cutting. The houses serve as the “fence” of the mangrove area.

8.3 Suitable Disused FLA Areas for Reforestation

Table 28 shows the assessment summary of the 62 FLA areas in the region that were visited. These include the canceled FLAs with areas that were reverted, those not yet reverted to DENR jurisdiction, and the ones that were identified as “abandoned” and “undeveloped.”

Not all disused FLA areas qualify for reforestation. Only 23% (284.26 ha) of the total area (1,239.93 ha) of disused FLA areas visited was found suitable. These were areas in the middle intertidal area, with nearby freshwater source, and adjacent to areas with mature mangroves. However, given that there were disused FLA areas adjacent to areas with officially declared canceled FLAs, the estimated total area (284.26 ha) represents the minimum area suitable for reforestation. It is highly likely that when all FLA fishponds have been inventoried, more areas would be identified as qualified for reversion and suitable for reforestation.

Table 28. Summary Assessment of the Suitability for Reforestation of Disused FLA Areas

<i>Province and number of FLA areas visited</i>	<i>Total area (ha)</i>	<i>Area for reforestation considering all areas that can be reforested based on environmental parameters (ha)</i>	<i>Area for reforestation by natural regeneration or active planting (ha)</i>	<i>Area for reforestation by natural regeneration only (ha)</i>	<i>Area for reforestation by active planting only (ha)</i>
Negros Occ (32)	188.92	84.09	41.01	43.08 ^a	0.00
Iloilo (16)	640.24**	133.70	0.00	0.00	133.7
Guimaras (3)	34.49	6.37 ^b	0.00	0.00	6.37 ^b
Capiz (14)	376.28***	60.10	60.10	0.00	0.00
All (62)	1,239.93 (100.00%)	284.26 (22.93%)	101.11	43.08	140.07

*excluding 1 FLA area (39.805 ha) not visited because the exact location was not found; ** excluding 2 FLA areas (46.5746 ha) not located; ^a needs hydrological restoration; ^b taken care of by the Zoological Society of London; Note: areas in hectares are estimates.

8.4 Natural Regeneration or Active Planting

Mangrove experts recommended actual planting in areas that cannot self-correct. On the other hand, active planting may be done in areas where natural regeneration is deemed difficult and/or when the regeneration potential is nil. The same recommendations are found in Melana et al. (2000), Gilman and Ellison (2007), Primavera (2000), and Lewis (2005). Of the total area suitable for reforestation, 43 ha were found suitable for natural regeneration and 140 ha, for active planting. Another 101.11 ha can either be actively planted or naturally vegetated.

8.5 Appropriate Mangrove Species

Table 29 presents the mangrove species suggested for planting in the disused FLA areas by province. The species identified reflect the characteristics of the FLA areas in terms of salinity, type of soil, and location (riverine, high and middle intertidal).

Table 29. Recommended Mangrove Species for Planting

<i>Province</i>	<i>Species Recommended</i>
Capiz	low salinity species like <i>Avicennia officinalis</i> (api-api)
Guimaras	no site for reforestation
Iloilo (Btac. Viejo)	<i>Avicennia marina</i> (api-api) <i>Sonneratia alba</i> (pagatpat) <i>Rhizophora mucronata</i> (bakhaw babae)
Negros Occidental (various areas)	<i>Avicennia marina</i> (api-api). <i>Rhizophora apiculata</i> (bakhaw lalaki) <i>Sonneratia Alba</i> (pagatpat) <i>Rhizophora mucronata</i> (bakhaw babae) <i>Avicennia rumphiana</i> (bungalon) <i>Xylocarpus granatum</i> (tabigi) <i>Avicennia alba</i> (bungalon) <i>Rhizophora stylosa</i> (bakhaw bato) <i>Bruguiera cylindrical</i> (pototan)

9.0 COST AND BENEFIT OF REVERSION OF FISHPOND LEASE AGREEMENT AREAS TO MANGROVE FORESTS

Once a disused FLA area is deemed suitable for reforestation, the next step is to calculate the cost and benefits of reforestation. If the benefits outweigh the cost, then it would be worthwhile to undertake the mangrove reforestation project.

9.1 Profile of Disused FLA Areas Suitable for Restoration

Table 30 shows the location, total area (ha) suitable for planting, recommended species, method of restoration, and the likely purpose of reforestation for each of the nine disused FLA areas found suitable for reforestation. The total area suitable for reforestation covered 277.76 ha; this excludes the 6.5 ha in Guimaras where reforestation efforts are ongoing under the Community-based Mangrove Reforestation Project of the Zoological Society of London. The location of the disused FLA area determines the suitable species for planting while the environmental condition decides the method of restoration and the likely purpose of reforestation.

Table 30. Profile of the Specific Disused FLA Sites* Suitable for Reforestation

<i>Site: barangay, city/mun/province</i>	<i>Location</i>	<i>Total area suitable for reforestation (ha)</i>	<i>Species**</i>	<i>Method of restoration*</i>	<i>Likely purpose of rehabilitation</i>
Washington Escalante City, Negros Occ.	seafront	16.42	<i>Avicennia marina</i>	Active planting or natural regeneration	Coastal protection
Buenavista Escalante City, Negros Occ.	mouth of Danao River	4.09	<i>Sonneratia alba</i> (present in the area)	Natural regeneration	Coastal protection
Jonob-jonob Escalante City, Negros Occ.	along Danao river	29.38	<i>Avicennia marina</i> <i>Sonneratia alba</i> (present in the area)	Natural regeneration	Restoration of structure and functional performance
Tinampaan Cadiz City, Negros Occ.	Along Tinampaan river and near the national road	23.43	<i>Rhizophora mucronata</i> <i>Avicennia rumphiana</i> <i>Avicennia alba</i> <i>Sonneratia alba</i>	Active planting or natural regeneration	Restoration of structure and functional performance
Lantad, Silay City, Negros Occ.	Sea front ; middle intertidal; undeveloped	2.34	<i>Avicennia marina</i> <i>Rhizophora apiculata</i> <i>Sonneratia alba</i> (present in the area)	natural regeneration only	Restoration of structure and functional performance
Punta Playa, Bago City, Negros Occ.	Seafront; middle intertidal, near Sibud Creek	2.39	<i>Rhizophora apiculata</i> <i>Rhizophora mucronata</i> <i>Rhizophora stylosa</i> <i>Bruguiera cylindrica</i> <i>Xylocarpus granatum</i>	Natural regeneration	Restoration of structure and functional performance
Latasan, E.B. Magalona, Negros Occ.	Seafront; facing Guimaras Strait	4.89	<i>Avicennia marina</i> <i>Rhizophora apiculata</i> <i>Rhizophora mucronata</i> (present in the area)	Natural restoration only	Restoration of structure and functional performance
Barangay 3 Pontevedra, Negros Occ.	Seafront; facing Guimaras Strait	1.16	<i>Sonneratia alba</i> <i>Avicennia marina</i> (present in the area)	Active planting or natural regeneration	Coastal protection
Pantalan President Roxas Capiz	Facing Tinagong Dagat; near mouth of river	49.00	low salinity species like <i>Sonneratia alba</i> (present in the area)	Active planting or natural regeneration	Restoration of structure and functional performance
Bantigue Pontevedra, Capiz	Facing Tinagong Dagat; near mouth of a river	11.0	low salinity species like <i>Sonneratia alba</i> (present in the area)	Active planting or natural regeneration	Coastal protection
San Fernando, Barotac Viejo Iloilo	Seafront; Part of Cañas Bay	133.69	<i>Avicennia marina</i> <i>Sonneratia alba</i> <i>Rhizophora mucronata</i>	Active regeneration	Coastal protection

*A site is made up of one FLA area or a group of FLA areas near each other; **determined by the mangrove expert in the team

The sites face the seas or along the river, thus all of them can be actively planted with mangroves. However, as mentioned in Section 8.1.3, those that can still self-correct should be left to do so but such areas should be protected from human encroachment. The sites need restoration either for coastal protection or for mangrove reestablishment so that they could perform functions at similar levels with the adjacent, relatively healthy mangrove area.

It was noted that most reforestation sites are found in Negros Occidental. On the other hand, although there are only two sites in Capiz and one site in Iloilo, these sites are bigger in terms of land area.

9.2 Cost of Reversion of Disused FLA Areas

The cost of reversion of disused FLA areas is determined by the method of reforestation adopted. Expectedly, higher costs will be incurred for active planting than when reforestation is through natural regeneration.

9.2.1 Cost of reforesting disused FLA sites through natural regeneration

Natural regeneration includes the social cost of protecting the area from human encroachment (maintenance cost) and the breaking of dikes to allow water to flow freely. The recommended length of time of protection is 5 years from planting of mangroves; the recommended ratio of caretaker to a hectare is 1:1. Women have been identified to be best in doing maintenance work. It is to be noted that in many reforestation projects, maintenance is not given much attention. Most often, maintenance is undertaken for one year at most and the caretaker:hectare ratio is not clear.

Table 31 shows the four sites (all in Negros Occidental) recommended for natural regeneration and the cost of doing so. In all these sites, portions of dikes need to be breached to allow the water to flow. This can be done manually and so will entail labor cost. Maintenance cost was estimated based on local wage rate (PhP 22.50/hour or PhP 180/day in the rural areas) at the recommended manpower:hectare ratio (1:1) for 5 years to ensure survival and growth of the mangroves.²⁰ The total cost per ha in year 1 was estimated at PhP 47,625.86 (USD 1,099.90); the succeeding annual total cost per ha was estimated to be about PhP 47,520 (USD 1,097.46).

9.2.2 Cost of reforesting disused FLA areas through active planting

The costs from nursery to outplanting of recommended species like *Avicennia*, *Sonneratia* and other middle/landward species used the estimate costs employed by the Community-based Mangrove Reforestation Project conducted by the Zoological Society of London (ZSL).²¹ Table 32 shows the cost of reversion through active planting of mangroves in six sites.

²⁰ As recommended by the mangrove expert in the team.

²¹ The ZSL, a UK-based NGO, has been in Panay Island Area since 2008 helping people's organization in mangrove plantation through their Community Mangrove Reforestation Program (CMRP). One of the reforestation sites is a disused FLA area covered by the study. Given the area of operation and the recency of the reforestation efforts, adopting ZSL's cost of reforestation is ideal.

Table 31. Cost of Reversion of Disused FLA Areas through Natural Regeneration

<i>Site</i>	<i>Total area (ha)</i>	<i>Dikes breaching (PhP, USD)</i>	<i>Protection and replanting cost/year (PhP, USD)</i>	<i>Total cost in Year 1 (PhP, USD)</i>
Buenavista, Escalante, Negros Occidental	4.08	900.00 (20.78)	193,881.60 (4,477.64)	194,781.60 (4,498.42)
Jonob Jonob, Escalante, Negros Occidental	29.38	1,500.00 (34.64)	1,396,028.30 (32,240.84)	1,397,528.30 (32,275.48)
Lantad, Silay, Negros Occidental	2.34	720.00 (16.63)	111,386.88 (2,572.45)	112,106.88 (2,589.07)
Punta Playa, Bago, Negros Occidental	2.39	720.00 (16.63)	113,430.24 (2619.64)	114,150.24 (2,636.26)
Latasan, EB Magalona, Negros Occidental	4.89	720.00 (16.63)	232,230.24 (5363.28)	232,950.24 (5,379.91)
Total	43.08	4,560.00 (105.31)	2,046,957.26 (47,273.84)	2,051,517.26 (47,379.15)
Cost/ha per year			47,520.00 (1,097.46)	47,625.86 (1,099.79)

Figures in parentheses are in USD.

Table 32. Cost of Reversion of Disused FLA Areas through Active Planting

<i>Site</i>	<i>Total area (ha)</i>	<i>Breaking of dikes (PhP)</i>	<i>Nursery bagging (PhP)</i>	<i>Nursery shed (PhP)</i>	<i>Outplanting (PhP)</i>	<i>Annual maintenance and protection (PhP)</i>	<i>Total cost (PhP, USD)</i>
Washington, Escalante, Negros Occ	16.42	-	766,266.67	7,000.00	206,892.00	780,278.40	1,760,437.07 (40,656.75)
Tinampaan, Cadiz, Negros Occ	23.43	900.00	1,093,199.33	7,000.00	295,163.82	1,113,251.04	2,509,514.19 (57,956.45)
Pontevedra, Negros Occ	1.16	3,000.00	54,226.67	6,000.00	14,641.20	55,218.24	133,086.11 (3,073.58)
Pantalan, Pres. Roxas, Capiz	49.00	-	2,286,666.67	8,000.00	617,400.00	2,328,480.00	5,240,546.67 (21,028.79)
Bantigue, Pontevedra, Capiz	11.00	600.00	513,333.33	7,000.00	138,600.00	522,720.00	1,182,253.33 (27,303.77)
San Fernando, Barotac Viejo, Iloilo	133.69	-	6,238,852.67	8,000.00	1,684,490.22	6,352,934.54	14,284,277.43 (329,890.93)
Total Cost	234.70	4,500.00	10,952,545.33	43,000.00	2,957,187.24	11,152,882.22	25,110,114.80 (579,910.27)
Cost per ha						47,520 (1,097.46)	106,989.32 (2,470.88)

Figures in parentheses are in USD; nursery bagging - PhP 21,000/4,500 pieces; nursery shed - PhP 6,000-8,000; outplanting - PhP 12,600/ha

9.3 Benefit-Cost Analysis of Reversion of Disused FLA Areas to Mangrove Forests

The costs and benefits of mangroves for a span of 15 years were compared. The values were discounted at three discount rates: 5%, 10%, and 15%. To calculate the benefits, the study used the estimation of Sathirathai and Barbiers (2001) of the net present value (NPV) of benefits of a hectare of mangrove to a local community in Thailand. Values were adjusted following the formula of Saplaco (2000). Three adjustments were made: national income adjustment using gross domestic product (GDP) in purchasing power parity (PPP) terms to account for country differences in standard of living; inflation adjustment in consideration of price increases from the time the study was conducted (2001) to present (2010); and currency adjustment to express the values in local currency (PhP).

The analysis was done for two scenarios. One scenario uses direct use values. This means harvesting of mangrove products such as wood for fuel, medicines, and others is allowed. The other scenario reflects indirect use values only. This means that harvesting of mangrove products is not allowed. This is more reflective of the situation where mangrove cutting is banned.

Based on Tables 33 and 34, the benefits outweigh the costs of reforestation at different discount rates over the 15-year duration. The net benefits are higher when reforestation is via natural vegetation and if sustainable harvesting is allowed. The results indicate that it is best to revert disused FLA areas into mangrove forest. On the other hand, the finding that the increase in net benefits is marginal when harvesting is allowed supports the decision of not allowing mangrove cutting.

Table 33. Net Present Values (NPV) at Different Discount Rates for Two Scenarios (in USD) with Reforestation through Natural Regeneration

<i>Discount rate</i>	<i>NPV benefit without harvesting*</i>	<i>NPV benefit with harvesting**</i>	<i>NPV cost</i>	<i>B-C ratio with harvesting</i>	<i>B-C ratio without harvesting</i>
5	33,806.98-34,243.82	34,609.60 -35,046.44	5,636.54	6.00-6.08	6.14-6.22
10	20,414.64-20,678.44	20,899.31-21,163.11	4,510.79	4.53-4.58	4.63-4.69
15	18,544.18-18,783.78	18,984.47-19,224.10	4,603.34	4.03-4.08	4.12-4.18

*Using values from Sathirathai and Barbiers (2001), indirect use value only. **Using values from Sathirathai and Barbiers (2001), direct and indirect use values. Values were adjusted following the formula of Saplaco (2000).

Table 34. Net Present Values (NPV) at Different Discount Rates for Two Scenarios (in USD) with Reforestation through Active Planting

<i>Discount rate</i>	<i>NPV benefit without harvesting*</i>	<i>NPV benefit with harvesting**</i>	<i>NPV cost</i>	<i>B-C ratio with harvesting</i>	<i>B-C ratio without harvesting</i>
5	33,806.98-34,243.82	34,607.19-35,046.49	6,957.20	4.86-4.92	4.97-5.04
10	20,414.64-20,678.44	20,897.86-18,983.09	5,831.45	3.50-3.55	3.58-3.63
15	18,544.18-18,783.78	21,163.13-19,224.07	5,924.00	3.13-3.17	3.20 -3.25

*Using values from Sathirathai and Barbiers (2001), indirect use value only. **Using values from Sathirathai and Barbiers (2001), direct and indirect use values. Values were adjusted following the formula of Saplaco (2000).

10. EVALUATION OF FINANCING OPTIONS FOR MANGROVE REFORESTATION

This section presents the evaluation of seven financing options using five criteria. The seven financing options are classified into two groups: options with the lessees as responsible party (performance bond, lease and fees reflective of true economic rent, green tax/fine imposition, and beneficial use tax) and the options with no responsible party (DENR grants, voluntary support from the private sector, and funds from foreign agencies). The criteria are feasibility, funds generated, implementation complexity, attainment of other desirable goals, and sustainability.

10.1 Feasibility

Table 35 shows the evaluation results of the seven financing options in terms of feasibility. The various stakeholders evaluated the options differently. The mangrove and aquaculture experts preferred the options where the responsibility of paying for reforestation rests with lessees (performance bond, higher lease, green tax). Likewise, the environment managers preferred green tax/fine and higher lease and had a low preference for DENR grants. In contrast, the aquaculture managers highly preferred DENR grants together with performance bond, higher lease, and private sector support. The LGU managers highly preferred the beneficial use tax as this will redound to other benefits for the LGU, the green tax/fine, and foreign funding grant. It is noted that the experts and the LGU managers have also very low preference for DENR grants, which may reflect their dismay of DENR's ongoing reforestation projects. Based on previous efforts to raise the lease, the possibility of lessees accepting any option that will require them to pay is nil.

Table 35. Evaluation of the Seven Options in terms of Feasibility Criterion

<i>Option</i>	<i>Preferential ranking of mangrove and aquaculture experts</i>	<i>Preferential ranking of environment managers</i>	<i>Preferential ranking of aquaculture managers</i>	<i>Preferential ranking of LGU managers</i>	<i>Possibility of acceptance by lessees</i>	<i>Indicator summary</i>
Performance bond	High	Low	Very high	Low	No	2 Low
Lease reflective of economic rent	Very high	High	High	Low	No	3 Moderate
Green tax/fine	High	Very high	Low	High	No	3 Moderate
Beneficial use tax	Moderate	Low	Low	Very high	No	2 Low
DENR grant	Very low	Low	High	Very low	Yes	2 Low
Foreign funding grant	Low	Moderate	Very low	High	Yes	3 Moderate
Private sector support	Moderate	High	Moderate	Moderate	Yes	5 High

One point is given to the option ranked moderate to very high, none otherwise. ^b The higher the score, the better. Range: 1 to 5: 1 to 2 – low feasibility, 3 – moderate feasibility, 4 to 5 - high feasibility.

In general, the only option with a consistently high feasibility is private sector support. Meanwhile, the options where the responsibility of paying for reforestation lies with lessees received moderate to low preference in terms of feasibility.

10.2 Ease of Implementation

Ease of implementation refers to the extent of regulatory, legislative, and administrative requirements for the option to be implemented. Table 36 shows that the options where the responsibility for paying the reforestation is not with lessees are easier to implement than the options where the responsibility rests with them. Imposing a green fine was found to be highly complex to implement, while imposing a performance bond and raising the lease were found to be moderately complex.

Table 36. Evaluation of the Seven Options in terms of Ease of Implementation Criterion

	<i>Does not need legislation</i>	<i>Does not require proposal for submission</i>	<i>Does not need study to determine optimal rate/amount</i>	<i>Does not require additional inputs</i>	<i>Entails low enforcement and monitoring cost</i>	<i>Indicator summary</i>
Performance bond	No	Yes	No	Yes	Yes	3, moderate
Lease reflective of economic rent	Yes	Yes	No	No	No	2, low
Green tax/fine	No	Yes	No	No	No	1, very low
Beneficial use tax	Yes	Yes	Yes	Yes	No	4, high
DENR grant	Yes	No	Yes	Yes	Yes	4, high
Foreign funding grant	Yes	No	Yes	Yes	Yes	4, high
Private sector support	Yes	Maybe	Yes	Yes	Yes	5, very high

One point is given to every “yes” answer. The higher the score, the better. Range: 1 to 5: 1 to 2 – low ease, 3 – moderately easy, 4 to 5 - highly easy.

Two options -- performance bond and green fine imposition -- require national legislation in order to be implemented. On the other hand, the Fisheries Code of 1998 (Sections 9, 14 and 16) stipulates imposition of rental, application fee, and cash bond deposit.

The optimal levels of green fine and performance bond need to be determined through scientific studies. Section 14 of the 1998 Fisheries Code states that BFAR has the responsibility to conduct studies on resource rent of public lands for fishpond development. Moreover, if these new policies are to be imposed, they may require additional people and budget to ensure implementation. On the other hand, in order to determine who are to be charged with green fine, there is a need for information on each FLA area. Such information can only be collected by actual area visits.

Meanwhile, in imposing the beneficial use tax, the revenue powers of the local governments can be invoked (1991 LGC, Sections 129-130, Section 186, Section 205d). A local ordinance is needed before implementation. The assessment for real property (1991 LGC, Sections 218a, 220) and tax rate can be followed. Similarly, there is a need to visit the FLA areas to facilitate calculation of fair market value.

Section 13.d of FAO 197 stipulates that “annual rentals shall be set at levels that reflect resources rent accruing from the utilization of resources.” To implement this, political will and additional resources (e.g., budget and personnel) are necessary,

especially during the enforcement and monitoring phase. A credible empirical study to support the raise of rents from PhP 1,000/ha per year is necessary.

The other options only require special skills in drafting, packaging, and submitting grant proposals. This is especially true in seeking funding grant from DENR, foreign funding agencies, and the private sector. Proposals may be optional in the case of voluntary private sector support.

Except for performance bond, which is a one-time payment during renewal of the FLA, the other options requiring lessees to pay for reforestation would entail high enforcement and monitoring cost to ensure regular payments. The rest of the options do not entail monitoring and enforcement cost.

10.3 Likely Impact on Other Desirable Goals

Table 37 shows the evaluation of the seven financing options in terms of likely impact on other desirable objectives of the aquaculture industry or of society as a whole. The FLA policy or the aquaculture industry as a whole is beset with many problems. It would be ideal if the financing option can also address some of the problems of the sector and not just financing of mangrove rehabilitation.

Table 37. Evaluation of the Seven Options in terms of Likely Impact on Other Desirable Goals Criterion

<i>Option</i>	<i>Reduction in inequity</i>	<i>Increase in production efficiency</i>	<i>Increase in compliance with environmental laws and regulation</i>	<i>Indicator summary*</i>
Performance bond	Yes	Yes	Yes	3, High
Lease reflective of economic rent	Yes	Yes	Yes	3, High
Green fine	Yes	Yes	Yes	3, High
Beneficial use tax	Yes	Yes	Yes	3, High
DENR grant	No	No	Yes	1, Low
Foreign funding grant	No	No	Yes	1, Low
Private sector support	Yes	No	Yes	2, Moderate

One point is given to every “yes” answer; *The higher the score, the better. Range: 1 to 3: 1 – low impact, 2 – moderate impact, 3 - high impact; high means good.

The options requiring lessees to pay for mangrove reforestation will attract lessees who are serious in fishpond production. In this case, positive impacts will likely be felt such as reduced inequity (fewer number of lessees who treat having an FLA as an end in itself), increased production efficiency (to ensure enough revenues to pay the fees and have profit), and increased compliance with environmental laws (to avoid fines).

All options are seen as a push for compliance with environmental laws. The options to seek grants may have no impact on increasing fishpond or aquaculture production in general. Seeking private sector support may have a positive impact on inequity since, in some sense, it would provide the rich a venue to help the poor.

10.4 Funds Generated

Table 38 shows the qualitative remarks on the likely amount to be generated from each of the options. Ideally, the cost of the bond or taxes should cover the “worst case scenario” or that level that would not provide incentive for lessees to default. For

these options to work, they have to generate a sufficiently high amount of revenues to ensure a reasonable attempt to rehabilitate or reforest a disused FLA area into a mangrove forest.

The country has seen many reforestation efforts in the past. There had been six major externally funded mangrove rehabilitation projects in the country from 1957 to 2006 (Primavera and Esteban 2008). Funds came from the Overseas Economic Cooperation Fund (OECF), World Bank, Asian Development Bank, and Japan Bank of International Cooperation. The latest project on Community-based Resource Management Program (CBRMP) was funded by World Bank for USD 38 million. On the other hand, one funding source not yet explored in the country for projects that will benefit the environment such as mangrove reforestation is the Global Environment Facility.

The DENR grant is taxpayers' money. This means that restoration efforts funded through DENR are taxpayer-supported restoration. The amount may not be as high relative to what the other options can generate. Presently, DENR funds reforestations projects but not beyond PhP 200,000 (USD 4,618.94) per reforestation site. Similarly, although there are reforestation projects initiated by or with the help of the private sector, the amounts generated are not as high relative to what can be generated by the other options. Most of the time, the donation is good for a specific reforestation project and for the labor component only.

Table 38. Evaluation of the Seven Options in terms of likely amount of funds to be generated criterion.

<i>Option</i>	<i>Estimated amount to be generated and some comments (PhP, USD)</i>	<i>Indicator Summary</i>
Performance bond	88,590,600.00 ^a (USD 2,045,972.29)	High
Lease reflective of economic rent*	96,277,421.46 annually ^b (USD 2,223,497.03)	High
Green tax/fine	Expected to be high given the rampant violation, particularly for not observing a greenbelt, generating pollution, and other violations of fishery laws	High
Beneficial use tax	11,402,548.88 annually ^c (USD 263,338.31)	High
DENR grant	200,000 (USD 4,618.94)	Low
Foreign funding grant	e.g., WB: PhP 38 million under the CBRMP	High
Private sector support	Usually one time sponsorship of tree planting by corporations. Also include volunteer service on actual outplanting of mangroves.	Low

^a 7,031.65 ha of 671 expired FLAs x PhP 12,600/ha = direct outplanting cost

^b 14,253.1861 ha x FSP recommendation of USD 156/ha per year (1991). Currently, this is equivalent to PhP 6,700/ha per year, which is also the lowest rental rate for private fishponds existing in the region.

^c (PhP 40,000/ha assessed value*.02)* 14,253.1861 ha of total area

10.5 Sustainability

Funding sustainability is ensured when funds regularly come. This is necessary to ensure continuous reforestation, maintenance, and protection of mangrove areas. The seven options differ in terms of this criterion. There are those that are one-time payment (performance bond), payment when needed (green fine), granted when qualified (DENR grant, foreign funding, and private sector support), and regular payments (lease and beneficial use tax).

Table 39. Evaluation of the Seven Options in terms of Sustainability Criterion

<i>Option</i>	<i>Possibility of regular payments</i>
Performance bond	Low
Lease reflective of economic rent	High
Green tax/fine	Low
Beneficial use tax	High
DENR grant	Low
Foreign funding grant	Low
Private sector support	Moderate

10.6 Evaluation Summary

The optimal option is one with the following characteristics: high feasibility, easily implemented, high positive impacts on other desirable objectives, and able to generate a high amount of funds on a sustainable basis. Table 40 shows that no option meets this condition – that is, there is no optimal option. Rather, there are tradeoffs among the options. Generally, high amounts generated and with likely positive impact on other objectives come at the cost of difficult (but not impossible) implementation.

Among the options requiring lessees to pay for reforestation, the options on the lease reflective of economic rent and beneficial tax are promising. The funds from seeking grant from funding agencies may not be as high as those generated from bonds and taxes, yet the former would be relatively easier to implement.

Table 40. Summary Matrix of the Evaluation of the Seven Options

	<i>Feasibility</i>	<i>Ease of implementation</i>	<i>Likely impact on other desirable objectives</i>	<i>Amount generated</i>	<i>Sustainability</i>
Performance bond imposition	Low	Moderate	High	High	Low
Lease reflective of economic rent	Moderate	Low	High	High	High
Green tax imposition	Moderate	Very Low	High	High	Low
Beneficial use tax	Low	High	High	High	High
DENR grant	Low	High	Low	Low	Low
Foreign funding grant	Moderate	High	Low	High	Low
Private sector support	High	Very High	Moderate	Low	Moderate

11. CONCLUSIONS AND RECOMMENDATIONS

11.1 Conclusions

The current state of the mangrove resources in the Philippines calls for urgent intervention to prevent further deforestation and degradation. One intervention is to bring the mangroves back to their natural habitat -- the middle intertidal coastal areas. This can be done by the reversion of disused FLA areas to mangrove forests. Despite the policies issued on this, efforts toward this direction have been very slow.

The present study focused on evaluating the policy of reverting disused FLA areas to mangrove forests using the case of Region VI (Western Visayas). This region was chosen because it has the most number of FLAs issued in the country, the most number of canceled FLAs, the most number of canceled FLAs with areas reverted to DENR for reversion to original mangrove state, and the largest area released for fishpond development. The region also contributes significantly to total aquaculture production, particularly milkfish production. The recent extreme weather disturbances experienced in the region have heightened the need for mangrove protection and reforestation.

Reversion of disused FLA areas to mangrove forest is urgent not only due to environmental reasons but also as a response to a number of unintended economic and institutional consequences and concerns on FLA issuance. Right from the beginning, the FLA program has been inequitable because only a few (the lessees and their workers) directly benefit from it. The program extends to lessees a high incentive package (PhP 1,000/ha per year, 25 year lease, maximum of 50 ha for individuals and 250 ha for corporations, associations, or cooperatives), which has resulted in inefficiencies (low productivity, low impact on local employment, and rental not reflecting correct resource rent). Reverting the disused FLA areas to their original mangrove state will directly benefit more individuals from the services offered by mangrove resources.

The study used a two-stage, five-step process in evaluating the FLA policy. The first stage assessed the processes of FLA cancellation and the reversion of jurisdiction over a disused FLA area from DA-BFAR to DENR. The second stage involved the actual reversion of the disused FLA areas to a mangrove forest. For the second stage, the study used the data from officially declared canceled FLAs and FLA areas officially identified as abandoned and undeveloped in the region. The disused fishponds were assessed in terms of suitability for reforestation. For those found suitable, the costs and benefits of reforestation were calculated. The evaluation ended with an analysis of seven potential policy options for financing reforestation using five criteria: feasibility, ease of implementation, likely impact on other desirable goals, funds generated, and sustainability.

The study used multiple data collection methods, including archival work, onsite ocular inspection of abandoned FLA areas or those with canceled FLAs, interviews, experts' opinion, intensive review of literature, and collection and assessment of pertinent records/data from government agencies. It covered 62 FLA areas representing 84% of the official number (74) of canceled FLAs in Region VI and FLA areas officially identified as abandoned and undeveloped. These abandoned FLA areas and those with canceled FLAs are in 27 sites in 19 cities and municipalities in the region's four provinces: Negros Occidental, Iloilo, Guimaras, and Capiz.

The whole FLA policy was found to be problematic. The processes of cancellation of FLAs and reversion of jurisdiction over disused FLA areas from BFAR to DENR are fraught with problems (institutional, economic, and political), leading to a fewer number of canceled FLAs and reverted FLA areas than what should be. Thus, if the reversion process (reverting disused FLA areas to mangrove forest) is to work, some critical changes have to be made. Such changes will have to start in the way the FLAs are enforced and canceled and the way the jurisdiction over the areas is transferred from BFAR to DENR. A number of basic things need to be done such as formulation and approval of guidelines on the FLA cancellation and reversion of area jurisdiction.

Disused FLA areas do not automatically qualify for reforestation. A suitability assessment should be made before any decision is done on the actual reversion to the original mangrove state. In the case of disused FLA areas assessed, only 23% (284 ha) were suitable for reforestation. Many were located in the lower intertidal zone or foreshore area, thus not suitable for mangrove rehabilitation. Some areas were not originally mangrove areas. Further, if the disused FLA area is not suitable for reforestation, its best use has to be determined and pursued.

Also, reforestation does not always mean active reforestation. Given suitable environmental conditions, an area may vegetate naturally. Of the total area (284 ha) suitable for reforestation, 43 ha were found suitable for natural regeneration and 140 ha for active planting. Another 101.11 ha can either naturally vegetate or be actively planted.

Financing reforestation of disused FLA areas turned out to be a secondary challenge. As depicted above, the primary challenges are found in the processes of identification and cancellation of FLAs, and the reversion of area jurisdiction from BFAR to DENR. When the disused FLA area is suitable for reforestation, then financing becomes a concern. The suitable mode of reforestation influences the cost. Active planting entails higher cost than natural regeneration. Aside from protecting the area from encroachment (required in natural regeneration) and maintaining it, costs are incurred for nursery establishment and outplanting when active planting is necessary.

The evaluation of the financing options showed that tradeoffs are necessary. The options where the responsibility for paying for reforestation rests on lessees (performance bond, green tax, fees reflective of economic rent, and beneficial tax) will generate high amounts and have positive impacts on other desirable goals in aquaculture but are relatively difficult to implement. On the other hand, the options where the responsibility to pay for reforestation cannot be identified (DENR grant, foreign fund, private sector support) are relatively easier to implement but may generate lower amounts and may not be sustainable.

11.2 Recommendations

For a better implementation of FLAs, a lower incentive package (higher rentals, shorter lease period, and smaller maximum area than at present) is needed. It can reduce inefficiencies and inequity that characterize the present situation. It will also attract lessees who are serious in fishpond production and contribute to the goal of food production and security.

Since issuance of new FLAs is no longer allowed, a better screening process for renewal and transfer of lease is important. Approved guidelines on renewal and transfer of lease must be observed. Also, the high number of expired FLAs deserves attention. The decision on what to do with these expired FLAs should be evaluated in terms of efficiency, equity, food security, and environmental impact.

Toward returning the mangroves to their habitat (i.e., the middle intertidal region), a survey of all FLA areas in the region is needed, which later could be scaled up to the national level. The main objective is to identify the FLAs for cancellation and for their areas covered to be eventually reverted to DENR. Once the FLA areas are returned to DENR, suitability assessment for reforestation should right away follow. Mangrove reforestation should be carried out in disused FLA areas found suitable for this purpose.

In support of the reversion of disused FLA areas to mangrove forests, a few basic things must be put in place aside from having more human resources to implement the policy, as follows:

- 1) *Approved guidelines on FLA cancellation and the guidelines on the reversion of area jurisdiction from BFAR to DENR.* Once the FLA is canceled, the reversion of jurisdiction to DENR should be automatic (i.e., should not be open anymore for application).
- 2) *A database of all FLA areas, including all types of fishponds and mangrove areas in the region.* There should be electronic record keeping of FLAs and regular monitoring of the FLA areas.
- 3) *A review (with the view to harmonize) of related laws, policies, rules, and regulations on fishponds related to FLAs.*
- 4) *Coordination among DENR, BFAR, and concerned LGUs (as specified in JAO 2008).* The National Task Force on AUU reversion to mangrove forest with membership from these agencies should be already created and should start to work.

LGUs may be given a bigger role in FLA implementation, especially since they have better access to local information (such as whether an area is actively used for fishpond purposes or not) than DENR or BFAR. Moreover, they can assume a bigger role in mangrove reforestation, particularly in the reversion of disused FLA areas in their jurisdiction.

The national government should be serious in embarking on a nationwide mangrove reforestation. These can be actively pursued under the National Greening Program launched recently by the national government with various agencies of the government, including DENR and DA as implementers.

A Mangrove Reforestation Fund can be set up for this purpose; fund may be drawn from different sources such as the lessees (by increasing rental and other fees, imposition of green fine, beneficial use tax) and funding agencies. Credible empirical studies to determine correct rentals, fines, or taxes are needed.

REFERENCES

- BAS (Bureau of Agricultural Statistics). (n.d.). Fisheries Statistics of the Philippines 2007-2009.
- BAS. (n.d.). Fisheries Statistics of the Philippines 2005-2007.
- BAS. (n.d.). Fisheries Statistics of the Philippines 2004-2006.
- BAS. (n.d.). Fisheries Statistics of the Philippines 2001- 2003.
- BAS. (n.d.). Fisheries Statistics of the Philippines 1997-2001.
- BFAR (Bureau of Fisheries and Aquatic Resources). Fisheries Administrative Order 1937. Downloaded from <http://www.bfar.da.gov.ph/legislation/fao/fao14.htm> on 4 August 2010.
- BFAR. Fisheries Administrative Order No. 14-2, s. 1945. Downloaded from <http://www.bfar.da.gov.ph/legislation/fao/fao14.htm> on 4 August 2010.
- BFAR. Fisheries Administrative Order No. 14-4, s. 1950. Downloaded from <http://www.bfar.da.gov.ph/legislation/fao/fao14.htm> on 4 August 2010.
- BFAR. Fisheries Administrative Order No. 14-8, s. 1955. Downloaded from <http://www.bfar.da.gov.ph/legislation/fao/fao14.htm> on 4 August 2010.
- BFAR. Fisheries Administrative Order No. 14-10, s. 1956. Downloaded from <http://www.bfar.da.gov.ph/legislation/fao/fao14.htm> on August 4, 2010.
- BFAR. Fisheries Administrative Order No. 1979. Downloaded from <http://www.bfar.da.gov.ph/legislation/fao/fao14.htm> on 4 August 2010.
- BFAR. Fisheries Administrative Order No. 125-1, s. 1991. Downloaded from <http://www.bfar.da.gov.ph/legislation/fao/fao14.htm> on 4 August 2010.
- Burgos, Nestor Jr. P. 2007. "Environmentalists: Turn idle fishponds into mangrove forests." Downloaded from <http://www.inquirer.net/specialfeatures/theenvironmentreport/view.php?db=1&article=20070921-89950>.
- Burgos, Nestor Jr. P. 2010. "Gov't releases P600M for typhoon Frank rehabilitation." Inquirer Visayas. Downloaded from <http://newsinfo.inquirer.net/breakingnews/regions/view/20100530-272924/Govt-releases-P600M-for-typhoon-Frank-rehabilitation> on 5 October 2010.
- COA (Commission on Audit). 2010 Annual Audit Reports NGAs: Department of Agriculture, Bureau of Fisheries and Aquatic Resources, Downloaded from <http://www.coa.gov.ph/Audit/AAR.htm> on 12 January 2011.
- COA. . 2009 Annual Audit Reports NGAs, Department of Agriculture, Bureau of Fisheries and Aquatic Resources. Downloaded from <http://www.coa.gov.ph/Audit/AAR.htm> on 12 January 2011.
- COA. 2008 Annual Audit Reports NGAs: Department of Agriculture, Bureau of Fisheries and Aquatic Resources. Downloaded from <http://www.coa.gov.ph/Audit/AAR.htm> on 12 January 2011.
- DENR (Department of Environment and Natural Resources). 1992. Manual of Operations for Devolved Forest Management Functions. Quezon City: DENR.

- DENR Administrative Order No. 15 series of 1990. Downloaded from http://www.denr.gov.ph/policy/1990/FOR_DAO_1990-15.pdf on 23 February 2011.
- DENR. 2008. Annual Report (December 2008). DENR VI Coastal and Marine Management Division.
- Escobar, J. E., Jr. and Eusebio Jacinto, Jr. 2006. Aquaculture for Rural Development in the Philippines: Privatization vs. Community Property Rights? Tambuyog Development Center, Quezon City, Philippines. Downloaded from http://www.indiana.edu/~iascp/bali/papers/Escobar_Jaime_Aquaculture.pdf on 24 November 2010.
- Genio, E. L. Jr., Roderick M. Rejesus, Robert S. Pomeroy, Alan White, and Becky Smith. 2007. Factors affecting fisherfolk's support for coastal resource management: The case of local government initiated mangrove protection activities. *Ocean & Coastal Management*, 50 (2007): 808–82. Downloaded from mangroveactionproject.org/files/news on 16 March 2010.
- Gilman, E. and Joanna Ellison. 2007. Efficacy of alternative low-cost approaches to mangrove restoration, American Samoa. *Estuaries and Coasts*, 30(4): 641-651. Downloaded from <http://sites.google.com/site/publicationsericgilman/> in July 2010.
- Go, Marianne. 2008. "Crop damage reaches P3.3 B". *The Philippine Star*. Downloaded from <http://www.philstar.com/Article.aspx?articleId=69235> on 5 October 2010.
- Hishamunda, N., P.B. Bueno, N. Ridler, and W.G. Yap. 2009. Analysis of aquaculture development in Southeast Asia: a policy perspective. *FAO Fisheries and Aquaculture Technical Paper*. No. 509. Rome, FAO, 69p.
- Holl, K.D. and R.B. Howarth. 2000. Paying for restoration. *Restoration Ecology*, 8 (3):00 260-267.
- IUCN paper. (n.d.). Ecological and socioeconomic values of mangrove ecosystems in tsunami affected areas: Rapid ecological-economic-livelihood assessment of Ban Naca and Ban Bangman in Ranong Province, Thailand.
- Kraft, Norman William S. 1997. Regulatory measures in the issuance of Fishpond Lease Agreements (FLAs). Staff Paper. Agricultural Credit and Policy Council. Manila,
- Lewis, R. R. III. 2005. Ecological engineering for successful management and restoration of mangrove forests. *Ecological Engineering*, 24: 403–41. Downloaded from www.mangroverestoration.com/Ecol_Eng_Mangrove_Rest_Lewis_2005.pdf
- Lewis, R. R. III. 2001. "Mangrove restoration - Costs and benefits of successful ecological restoration". In *Proceedings of the Mangrove Valuation Workshop*, Universiti Sains Malaysia, Penang, 4-8 April, 2001. Beijer International Institute of Ecological Economics, Stockholm, Sweden.
- Llanto, G. M. and Marife T. Magno. 1994. The impact of agrarian reform on credit markets in the aquaculture sector. Discussion Paper Series No. 94-09. Philippine Institute for Development Studies Downloaded from www3.pids.gov.ph/ris/dps/pidsdps9409.pd on 3 December 2010.

- Melana, D.M., J. Atchue III, C.R. Yao, R. Edwards, R.R. Melana, and H.T. Gonzales. 2000a. Mangrove Management Handbook. Department of Environment and Natural Resources, Manila, Philippines through the Coastal Resource Management Project, Cebu City, Philippines, 96p.
- Mines and Geosciences Bureau Region 6 (MGB-6). 2006. 191 barangays in WV prone to potential geologic hazards. Downloaded from <http://www.mgb.gov.ph/news/2006-1219wvgeohazard.htm> on 16 June 2011.
- Perez, Asis G. 2006. Mangrove Tenure Assessment Report for Zamboanga Sibugay. The Philippine Environmental Governance 2 Project with Support from USAID. Downloaded from ecogovproject.denr.gov.ph/docs/EcoGov_2-TechRep on 24 January 2010.
- Primavera, Jurgenne, Maricar Samson, and Joseph Bulawan Binas. 2009. Abandoned/unutilized ponds can revert to mangrove forests (abstract). Downloaded from <http://www.msi.upd.edu.ph/pams/ocs/index.php/pams10/pams10/paper/viewPaper/44> on 12 January 2010
- Primavera, J.H. and J.M.A. Esteban. 2008. A review of mangrove rehabilitation in the Philippines: successes, failures and future prospects. *Wetlands Ecological Management* 16:345-358.
- Primavera, Jurgenne. 2005. Mangroves, fishponds, and the quest for sustainability. *Science*, 310 (5745):57-59. Downloaded from <http://www.sciencemag.org/cgi/content/full/310/5745/57> on 24 January 2010.
- Primavera, Jurgenne. 2000. Development and conservation of Philippine mangroves: Institutional issues. Special Issue – The Values of Wetlands: Landscape and Institutional Perspectives. *Ecological Economics*, 35 (2000):91-106.
- Primavera, Jurgenne. 1995. Mangroves and brackish water pond culture in the Philippines. *Hydrobiologia*. Y.S. Wong and N.F. Y. Tam (eds). Asia-Pacific Symposium on Mangrove Ecosystems. 295:303-309.
- Samson, M. S. and R. Rollon. 2008. Growth performance of planted mangroves in the Philippines: Revisiting forest management strategies. *Ambio*. 3(4):234-240. Royal Swedish Academy of Sciences.
- Saplaco, R. 2000. VALUASIA: Benefits transfer for Southeast Asia. Unpublished undergraduate thesis. College of Economics and Management, University of the Philippines Los Banos, Laguna, Philippines.
- Sathirathai, Suthawan and Edgar B. Barbiers. 2001. Valuing mangrove conservation in Southern Thailand. *Contemporary Economic Policy*, 19 (2):102-122.
- Stevenson, N.J. (n.d.). Disused shrimp ponds: Options for redevelopment of mangrove. *Coastal Management*, 25 (4):423-425.
- White, A.T. and R.O.D De Leon. 2004. Mangrove resource decline in the Philippines: Government and community look for new solutions, p. 84-89. *In* DA-BFAR. *In* Turbulent Seas: The Status of Philippine Marine Fisheries. CRMP, Cebu City, Philippines. 378 p.

- White, A.T. and A. Cruz-Trinidad. 1998. The Values of Philippine Coastal Resources: Why Protection and Management are Critical. Coastal Resource Management Project, Cebu City, Philippines. 96 p.
- Yao, Calixto E. 2000. Saving the mangroves of Bohol. Over Seas: the online magazine for sustainable seas. 3(11). Downloaded from http://www.oneocean.org/overseas/200011/saving_the_mangroves_of_bohol.html on 25 January 2010.
- Yap, Wilfredo G. 2010. Contribution of FLA areas to Philippine fish production. A paper presented at a Seminar-Workshop on Fishpond Lease Agreement (FLA) Cancellation and Reversion to Mangrove Forests. 28-30 July 2010, Iloilo City, Philippines.
- Yap, Wilfredo G. 2007. Assessment of FLA Holdings in Four Pilot Regions. Appendix to the Report "Strategy for Sustainable Aquaculture Development for Poverty Reduction (ADTA: PHI 4708), Philippines" by WorldFish Center and Pacific Rim Innovation and Management Exponents, Inc. Philippines (PRIMEX).
- Yap, Wilfredo G. 1999. Rural Aquaculture in the Philippines. RAP Publication 1999/20. Bangkok, Thailand: Food and Agriculture Organization of the United Nations. Downloaded from <http://www.fao.org/docrep/003/x6943e/x6943e08.htm#bm08.2> on 25 January 2011.



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