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## The Impact of Agrarian Reform on Credit Markets in the Aquaculture Sector

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Philippine Institute for Development Studies

## The Impact of Agrarian Reform on Credit Markets in the Aquaculture Sector

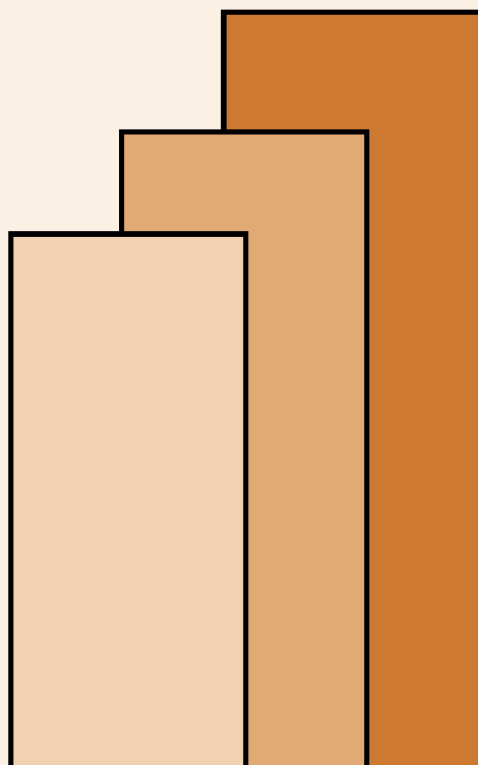
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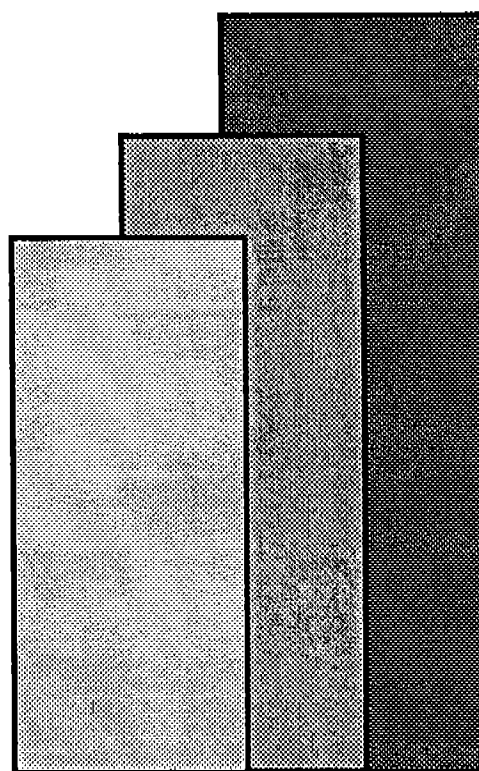
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# **THE IMPACT OF AGRARIAN REFORM ON CREDIT MARKETS IN THE AQUACULTURE SECTOR**

by

*Gilberto M. Llanto and Marife Magno*  
**Philippine Institute for Development Studies**

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**DYNAMICS OF RURAL DEVELOPMENT PROJECT, PHASE II**  
October 1993

## TABLE OF CONTENTS

PAGE No.

### LIST OF TABLES

I.	INTRODUCTION	1
II.	BACKGROUND ON THE PHILIPPINE AQUACULTURE INDUSTRY	3
	A. Aquaculture Production Trends	3
	B. Milkfish/Prawn Production Trends	3
	C. Trade and Comparative Advantage	4
	D. The Credit Market for Aquaculture	5
III.	ANALYTICAL FRAMEWORK	8
IV.	METHODOLOGY AND SAMPLING DESIGN	11
	A. Description of Survey Area	11
	B. Data Sources	11
	C. Selection of the Survey Area	12
	D. Selection of the Sample Respondents	13
	1. Fish Operator-Respondent	13
	2. Banking Institution-Respondent	15
	3. Borrower-Respondent	15
	E. Hypotheses and Analytical Methods	15
	F. Limitations of the Study	17
V.	FARMING PRACTICES, FINANCING ACTIVITIES AND PERCEPTION OF CARP BY SAMPLED FISHPOND	19
VI.	CREDIT RATIONING BEHAVIOR OF BANKS UNDER CARP	26
	A. Bank Level Information	26
	B. Account Level Information	29
VII.	ARE THERE ECONOMIES OF SCALE IN AQUACULTURE?	32
VIII.	CONCLUSIONS AND POLICY IMPLICATIONS	35
	REFERENCES	37

## LIST OF TABLES

Table No.	Title
1	Fisheries Production By Sector, Philippines, 1981-1991 (In thousand Metric Tons)
2	Brackishwater Fishponds in Operation, Philippines, 1980-1990 ( In Hectare)
3	Aquaculture Production by Selected Species, Philippines, 1981-1991 (In Thousand Metric Tons)
4	Milkfish and Prawn Production by Sector, Philippines, 1981-1991 (In thousand Metric Tons)
5	Quantity of Milkfish Production in Brackishwater Fishponds by Region, Philippines, 1981-1991
6	Quantity of Prawn Production in Brackishwater Fishponds by Region, Philippines, 1981-1991
7	World catch of Shrimps and Prawns by Major Producing Countries, 1985-1988
8	Major Shrimp, Prawn Aquaculture Producers, 1986-1989
9	World Exports of Shrimps and Prawns by Major Exporting Countries, 1980-1989
10	Export Value (\$/MT) of Shrimps and Prawns by Country
11	Cost and Returns of Philippine Prawn Production by Culture Method, (P/Ha./Cropping)
12	Exports of Milkfish by Kind, Country of Distribution, and Quantity, Philippines, 1990-1991
13	Cost and Returns of Philippine Milkfish Production (P/Ha./Cropping)
14	Extent of Borrowing of Fishpond Operators (In Percent)
15	Agricultural Production Loans Granted, By Commodity: 1980-1991 (In Million Pesos at Constant Prices of 1972)

- 16        Loans Granted to Fisheries by Institution, 1986-1991 (Amount in Million Pesos at Constant Prices of 1972)
- 17        Features of Major Credit Programs for the Aquaculture Sector
- 18        GFSME Prawn Financing Projects (In Million Pesos)
- 19        Loans Granted to Aquaculture Under Agricultural Guarantee Institutions (As of June 30, 1992)
- 20        Repayment of Performance and Default Conditions of Loan Granted to Aquaculture (As of December 1991)
- 21        Brackishwater Fishponds in Operation
- 22        Frequency and Percentage Distribution of Sample Respondents by Area, Pond Authorization, Culture Species, and Size of Farm (N = 241)
- 23        Frequency Distribution of Accounts (Selected Banks)
- 24        Distribution of Sample Fishpond Operators by Type of Species Cultured and by Fishpond Ownership, 1991
- 25        Size of Fishpond Area of Sample Fishpond Operators
- 26        Proportion of Total Fishpond Area Developed
- 27        Distribution of Sample Fishpond by Their Reasons for not Developing Total Fishpond Authorization, 1991
- 28        Distribution of Sample Milkfish and Prawns Operators as to Ownership of Equipment/Machineries
- 29        Distribution of Sample Fishpond Operators by Culture Method
- 30        Proportion of Inputs Cost to Total Operating Expenses by Fishpond Authorization and by Species Cultured, 1991
- 31        Average Input Cost per Cropping per Hectare
- 32        Average Cost per Cropping per Hectare of Inputs Used by Sample Milkfish and Prawn Fishpond Operators by Culture Method and Fishpond Authorization

- 33 Average Production of Sample Fishpond Operators
- 34 Average Profitability per Cropping per Hectare of Sample Fishpond Operators
- 35 Average Disposal of Harvest of Fishpond Operators by Fishpond Authorization and By Species Cultured
- 36 Average Prices Received by Sample Fishpond by Sample Fishpond Operators by Type of Species Cultured and BY Fishpond Authorization (1990-1991)
- 37 Major Constraints that Prevented Attainment of Maximum Production Level of Sample Fishpond Operators, 1991
- 38 Average Proportion of Capital Obtained by Sample Fishpond Operators from Various Sources of Species and by Fishpond Authorization, 1991
- 39 Distribution of Sample Fishpond Operators by Source of Own Capital, by Fishpond Authorization and by Species, 1991
- 40 Distribution of Sample Fishpond Operators by Loan Purpose and by Source of Credit (Banking Institutions)
- 41 Loans Borrowed by Fishpond Operators from Banking Institutions by Fishpond Authorization and by Species Cultured
- 42 Types of Collateral Offered by Sample Fishpond Operators by Fishpond Authorization
- 43 Distribution of Sample Fishpond Operators on Reasons for not Borrowing if Credit is available by Fishpond Authorization
- 44 Average Time and Amount Spent by Sample Fishpond Operators in Availing of Credit from banking Institutions
- 45 Borrowings of Sample Fishpond Operators from Informal Sources
- 46 Transaction Cost and Time Spent of Sample Fishpond Operators in Availing of Credit from Informal Sources
- 47 Distribution of Sample Fishpond Operators with Respect to effect of CARP
- 48 Distribution of Sample Fishpond Operators on the Negative Effect of CARP on Credit Availment from Banks



- 49 Reasons Why CARP Does Not Affect Credit Access from Banks
- 50 Reasons Why CARP Does Not Affect Credit Access from Informal Sources
- 51 Distribution of Sample Banks by Type and by Location
- 52 Profile of the Sample Banks by Type (As of 1991)
- 53 Extent of Credit Rationing Among Sample Banks by Type of Bank and Borrower
- 54 Reason for Loan Rejection by Type of Loan
- 55 Mean Loan-Collateral Ratio by Type of Collateral and by Type of Bank
- 56 Sufficiency of Collateral by Type of Bank
- 57 Reasons for the Unacceptability/Insufficiency of Farmlands as Collateral by Type and by bank
- 58 Other Requirements of Banks for Loan Approval by Type of Bank
- 59 Average Loan Size by Type of Loan and by Type of Bank (As of 1991)
- 60 Impact of CARP on Banks' Operation by Type of bank
- 61 Reasons for the Negative Impact of CARP in Banks' Operation by Type of Bank
- 62 Reasons for A No Effect Impact of CARP on Banks' Operations
- 63 Banks Suggested Financing Scheme for Fishpond Operators Under CARP by Type of Bank
- 64 Loans Granted by Type of Loan and by Bank, 1986-1991 (At Constant Prices, Base Year = 1972)
- 65 Rationed and Non-Rationed by Type of Borrower
- 66 Distribution of Sample Borrowers as to Income Level by Type of Borrower and by Type of Bank
- 67 Distribution of Sample Borrower by Type of Collateral Offered, by Type of Borrower and by Type of bank

68	Results of Quantity-Response Model
69	Distribution of Rationed and Non-Rationed Borrowers by Purpose of Loan and by Type of bank
70	The Estimated Cobb-Douglas Production Function, $Y =$ Total Production (In Kilos)
71	Mean of Capital, Land, Labor and Output

# THE IMPACT OF AGRARIAN REFORM ON CREDIT MARKETS IN THE AQUACULTURE SECTOR

by

*Gilberto M. Llanto and Marife T. Magno<sup>1</sup>*

## CHAPTER I INTRODUCTION

The Comprehensive Agrarian Reform Program (CARP) which limits farm size to five hectares will have a direct effect on production and cost structures. This will have profound implications for the aquaculture sector which seems to face an increasing cost structure and stiff worldwide competition from producers in Indonesia and Thailand who are able to exploit scale economies. It seems that in the Philippines aquaculture farms may have to be larger than the legally stipulated five hectares to remain competitive in world markets. There is evidence that smaller fishpond areas are less technically efficient and therefore, reducing farm sizes will have implications on the viability of operation and the fishpond operators' access to financing. While CARP for the aquaculture sector has been postponed for the next ten years, already anecdotal evidence indicates that the availability and accessibility of formal credit are emerging as outstanding constraints to the long-term viability of the industry.

This study focuses on the impact of CARP on the industry's access to formal finance. The specific objectives of the study are: (1) to document and assess banks' reaction to CARP; (2) to determine differences in banks' approach to lending to (i) prawn and milkfish growers and (ii) fishpond lease agreement (FLA) holders and non-FLA holders; (3) to describe and analyze the credit behavior and farming activities of milkfish and prawn operators as well as FLA and non-FLA operators; and (4) to determine whether scale economies exist in the aquaculture sector.

We present in Chapter II the current trends in Philippine aquaculture and a brief note on formal loans to the industry to serve as a general background for the paper. Chapter III discusses the analytical framework that organizes and motivates the study. Chapter IV presents the methodology and a regional profile of the sample area, Region VI (Western Visayas). In Chapter V the farming practices and financing activity of the sample milkfish and prawn operators are described. Chapter VI presents an analysis of the credit rationing behavior of

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<sup>1</sup> Research Fellow, Philippine Institute for Development Studies and Division Chief, Agricultural Credit Policy Council, respectively. The research assistance of Ms. Annabelle Fernandez is acknowledged.

sample banks. Chapter VII discusses economies of scale in aquaculture. A summary of the empirical findings and policy implications concludes the study in Chapter VIII.

## **CHAPTER II**

### **BACKGROUND ON THE PHILIPPINE AQUACULTURE INDUSTRY**

The potential of the aquaculture industry was recognized in the country only in the late 1970s when rising prices of fuel oil that heavily affected capture fisheries created the need to look for alternative sources of fish supply. The interest in the industry further rose as a result of the worsening resource depletion and "open-access" problems besetting capture fisheries and the increasing demand in domestic and world markets for aquaculture products, primarily prawns and milkfish. While at present aquaculture provides the lowest share (26.6 %) of the total supply of fish in the country, the industry's average annual growth rate of 7.4 percent for the last eleven years (1981-1991) is the highest among the other fisheries sectors (Table 1). The share of the municipal sector to total fish supply in the last five years has been declining while the commercial sector's share practically remained constant for the same period. Thus, the aquaculture sector presents excellent opportunities for meeting the rising demand for fish in the country.

#### **A. Aquaculture Production Trends**

Aquaculture production is carried out in water and land-based areas. Water-based production involves culture in fishcages and fishpens while land-based production consists of culture in both brackishwater and freshwater fishponds. As of 1990, fishpens and fishcages cover only 13,108 hectares, a large percentage (95%) of which is devoted to fishpond culture. Fishpond areas cover a total of 237,438 hectares of which 14,531 hectares are freshwater and 222,907 hectares brackishwater (Table 2). Fishpond areas are observed to be increasing at the rate of 2.4 percent from 1980 to 1990. Significant increases are noted particularly in 1984 and 1986 in response to the high export earnings realized from prawns. The low prices of prawns in the world market in the late 1980s, however, did not result in a decrease in the area devoted to brackishwater fishponds. A major reason is the difficulty in shifting land use to other more lucrative agricultural ventures. Further, fishpond operators also found it profitable to culture other aquatic species such as milkfish, tilapia and crabs.

Milkfish and prawn are the major species produced in aquaculture, on the average, accounting for 42.8 percent and 4.9 percent, respectively of total aquaculture production (Table 3). While production for both species has shown positive growth for the period 1981 to 1991, an impressive increase is observed in prawn culture as compared, in particular, to milkfish which showed a less than 1 percent growth rate.

#### **B. Milkfish/Prawn Production Trends**

Milkfish and prawns are produced from all sectors in fisheries, i.e., commercial, municipal and aquaculture. Production, however, is highly concentrated in the aquaculture

sector where an average of 97.7 percent of total milkfish production and 89.3 percent of the total prawn production is obtained (Table 4). As indicated earlier these species are mainly grown in brackishwater fishpond. Species cultured in freshwater fishponds are mainly Tilapia and CARP.

The largest producers of prawns are Western Visayas and Central Luzon (Table 5). These regions produced , on the average, 65.3 percent of total prawn production. However, the percentage share of Central Luzon to total production has been declining annually by 2.2 percent. On the other hand, the percentage share of Western Visayas to total prawn production grew by a minimal 0.8 percent per year. Although production in Western Visayas has a significant 40 percent annual growth rate, it has not been maintained as production started to decline in 1989. The peak year was 1987 when production grew by more than 100 percent. While we do not have information at this point on the reasons behind the declining trend in production, it may be surmised that low world market demand for prawns in addition to technical constraints in production have been important factors.

The top prawn-producing regions are likewise the major producers of milkfish. Western Visayas and Central Luzon account, on the average, for 62 percent of total milkfish production for the period 1981 to 1991 (Table 6). In Western Visayas, specifically, milkfish production has shown significant annual increases and an increasing proportionate share to total production. This trend is reversed with regard to prawn production in the region. On the other hand, Central Luzon showed a negative growth rate during the period. As with the Western Visayas region, the Ilocos Region which ranks third in milkfish production has likewise realized production increases during the period.

The Philippines is one of the ten top prawn/shrimp producing countries in the world (Table 7). However, the country's share in total world production of prawns/shrimps is minimal at only 3.1 percent on the average. Thailand and Indonesia produce twice more than what the country harvests. In terms of aquaculture production of prawn, the country, on the average, ranks fifth among the major prawn aquaculture producing countries. China has the highest production of prawns from aquaculture followed by Ecuador, Indonesia and Taiwan (Table 8). Although Thailand only ranks sixth in average prawn aquaculture production for the years 1986 to 1989, it displayed the most impressive increases in production considering an average annual growth rate of about 50 percent. Such growth is twice the growth rate in Indonesia and thrice that of the Philippines. If such trend continues, Thailand could easily become the top world producer of prawn.

### C. Trade and Comparative Advantage

A larger proportion of prawns/shrimps produced in the country is sold in foreign markets. This is in contrast to milkfish which is consumed mainly by the domestic market. The Philippines is among the top ten major exporter of prawns (Table 9). However, the country has the least share in the total quantity of exported prawns. India whose prawn production is

comparatively low has the highest share in the quantity of exported prawns. China, Indonesia, Denmark and Thailand occupy the succeeding ranks. Philippine prawns though is observed to be gaining stronger grounds in the export market despite a comparatively higher price. This is because of the preference of major prawn importing countries (e.g. USA, Japan) for Philippine prawn.

The relative popularity in the world market of Indian prawns is due to the lower price of their product relative to other major producers of prawn (Table 10). Prawns from Denmark, Vietnam and Greenland have lower prices but their lower production has reduced their importance among the top exporting countries. Export prices of Philippine prawn is noted to be comparatively high especially towards the later part of 1980. On the average, said price is 54.4 percent higher than the average price offered by India, 12.8 percent higher than that of Indonesia and 38.9 percent higher than that of Thailand. However, reducing the price of Philippine prawn in the export market comparable to those of other ASEAN countries may be difficult considering that operating cost alone (excluding interest rate, rent cost, depreciation) for exportable prawns range from \$2.60 to \$4.30 per kilogram (Table 11). When prawn prices in the export market declined to US\$3.60 from US\$4.10 per kilogram<sup>2</sup> in 1989 (Department of Agriculture, 1990) our prawn producers incurred heavy losses.

Philippine milkfish is exported mainly to the United States (Table 12). Comparable data across countries, however, are not available due to the relatively insignificant volume of milkfish traded in the world market. There is however a significant local demand for milkfish with its price observed to be competitive with those of other aquatic species. Cost-wise milkfish is relatively cheaper to produce than prawn. Operating costs under a modified extensive method amounts to only P0.67 per kilo for milkfish and P5.75 per kilo for prawns (Table 13).

#### **D. The Credit Market for Aquaculture**

The extent of borrowing from formal sources in the aquaculture sector differs among fishpond operators (Table 14). Cruz and Lizarando (1978) noted that in Quezon province a large number (91.4%) of brackishfishpond operators borrow. On the other hand, an average 14 percent of the fishpond operators in Regions 1, 3 and 6 borrow though a large (65%) proportion of self-financed operators expressed willingness to obtain a loan.

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<sup>2</sup>Exchange rate is P21.80 per dollar.

**Credit/Financing Support from the Banking Sector.** Loans granted by banks to the aquaculture sector are usually included in total fisheries accounts, hence, time series aquaculture loan data are not available. Based on the total fisheries production loans of banks, it is observed that loans to the fisheries industry represent, on the average 8.2 percent of the total loans granted by banks to agriculture from 1980 to 1991 (Table 15). This share is about 50 percent less than the share of livestock and poultry, 75 percent less than that of coconut and about 20 percent less than that of cereals and sugarcane. The small share of the fisheries sector represents a mismatch in investments since gross value added of fisheries is the highest among agricultural commodities. The mismatch appears to have been corrected in the late 1980s. While total production loans to agriculture declined in real terms for the period 1980 to 1991, loans to the fisheries sector increased in real terms at the rate of 4.6 percent per year.

The private commercial banks (PKBs) have been the major source of loans for the fisheries sector accounting for 82 percent of total fisheries loans (Table 16). Other private banks such as rural banks and private development banks have a sizeable share of loans to the sector. With the exception of savings and mortgage banks, all other privately-owned banks show increasing credit to fisheries, in real terms, from 1986 to 1991. Among specialized government banks, loans made by the Development Bank of the Philippines have been minimal and declining at the rate of 3.6 percent per year, in real terms. The Land Bank of the Philippines, on the other hand, has made a significant increase in loans to fisheries starting 1989 but this is because the Agricultural Credit Policy Council provided LandBank about P50 million as loanable funds for the sector.

**Credit Support from Non-Banking Sector.** The Private Development Corporation of the Philippines is the only non-bank institution that grants loan to the fisheries sector, in particular, to aquaculture. As of year end 1991, it has granted loans amounting to P6.12 million to 5 prawn operators. These loans have all been guaranteed by the Guarantee Fund for Small and Medium Enterprises (GFSME) (see Table 18).

**Credit/Financing Support from the Government.** The government supports the fisheries sector through (a) special credit programs and (b) credit guarantee. Government provides special loan funds which are channelled through government banks, which wholesale loans to private financial institutions. A list of the major credit programs that cater to fisheries and the aquaculture sector is presented in Table 17. Note, however, that there are still line agencies which are involved in direct lending, notwithstanding the present policy directing these line agencies to desist from extending direct credits.

Another principal intervention in the credit markets is the Comprehensive Agricultural Loan Fund (CALF) which was constituted as a guarantee fund from a pool of previous agricultural credit programs. Credit guarantee is a financial instrument aimed at minimizing the loan default risk faced by financial institutions in lending to some identified sectors. The major feature of this scheme is the risk-sharing mechanism between the guarantor and the bank. The risk shouldered by the guarantee institutions is up to a maximum of 85 percent of the guaranteed loan.



The Guarantee Fund for Small and Medium Enterprises (GFSME) has pioneered the provision of guarantee to aquaculture loans. As of June 30, 1992, a total of P124.10 million loans have been guaranteed by GFSME (Table 18). This has benefitted 69 borrowers, 70 percent of which came from Region 6. About 76 percent of the loan were originated by commercial banks primarily the Philippine Commercial and International Bank (PCIB). The two other guarantee institutions, namely the Philippine Crop Insurance Corporation and Quedancor also guaranteed loans for the fisheries sector by using funds obtained from the CALF.

Under the CALF program, a total of P119.92 million loans for the aquaculture sector have been guaranteed, about 39.2 percent of which covered prawn projects (Table 19). Among guarantee institutions, the PCIC-CALF has the largest exposure accounting for 48.4 percent of the total aquaculture loans guaranteed under the CALF.

**Repayment Performance and Default Conditions of Aquaculture Loans.** There is a mixed experience in the loan repayment performance of the aquaculture sector. While the Agricultural Loan Fund (ALF), the Aquaculture Development Project (ADP) and the Guarantee Fund for Small and Medium Enterprises (GFSME)-CALF credit facilities showed impressive repayment performances, other programs fared poorly (Table 20). The Agro-Industrial Technology Transfer Program (AITTP) and the Livelihood Enhancement for Agricultural Development (LEAD) showed a low recovery rate of 62 percent and 4.7 percent, respectively. Further, while the QGFB-CALF and the Small and Medium Enterprise Livelihood Program (SMELP) have good repayment performance, past due ratios are high at 100 percent and 42 percent, respectively. This occurs since past due loans under these programs are mostly refinanced or rolled over.

### CHAPTER III

#### ANALYTICAL FRAMEWORK

Risk, uncertainty and information problems characterize credit markets in the aquaculture sector. There are three types of risks: biological, environmental and socio-economic risks. Biological risk refers to the susceptibility of aquatic species to disease-inducing organisms; the uncertainty of the productive ability of certain species. Environmental risks act on the ecological system and include such activities as pollution, natural perils (storms, floods). Socio-economic factors are important considerations in aquaculture undertakings. Political instability, weak enforcement of property rights, labor unrest and policies and regulations that are biased against the industry affect critically the profitability of the sector. Uncertainty refers to the cloud of doubt regarding the implementation of CARP and the associated implication on ownership of aquaculture farms. Most fishponds in the country are medium size (10-50 hectares) and there are many farms bigger than the five hectare retention limit of CARP. The ten year postponement of CARP's implementation is no comfort to banks which doubt the acceptability of the affected farmlands as collateral.

In general rural credit markets operate in a milieu characterized by the following: (a) seasonal nature of agricultural production; (b) geographically-dispersed location of farmers; (c) the high susceptibility of the sector to natural calamities; (d) the large covariance of risks and (e) the basically subsistence nature of agriculture. The absence or undeveloped state of insurance markets exacerbate the situation for agricultural borrowers. The lack of adequate information on the viability of the project and the integrity of the borrower constrains the ability of banks to provide loans. Floro and Yotopoulos (1991) stress that these imperfections lead to credit rationing, credit layering and interlinkages which substitute for the missing network of complex legal/institutional and market infrastructure that make bank lending feasible.

Credit rationing would imply that loans would preferably be given to a "relatively homogeneous set of borrowers" who from the banks' view offer well-defined property rights, enforceable formal loan contracts and credit guarantees/security. Those agricultural borrowers, in the present study's case, the aquaculture fishfarmers who do not meet these bank requirements, are credit rationed and are mainly accommodated by the informal credit markets. The informal lenders have less information problems because of their personalistic relationship with the borrowers which enables them to have a more extensive and accurate evaluation of borrower risk. Further, informal lenders are able to put mechanisms to work (e.g. interlinked credit) that allow them to minimize credit risks brought about by the aforementioned factors in aquaculture.

The transactions in credit markets often demand the availability of collateral. The lender uses the collateral as a means to reduce loan default risk and to cover his lending losses by the liquidation of the collateral. This is not to say that the liquidation of collateral is costless because there are transaction costs attendant thereto and thus, the lender may not be fully reimbursed for the defaulted loan. Land is often preferred as a collateral depending on the

certainty of ownership and the ease of transfer of ownership from the borrower to the lender upon default; and of course, on the valuation of land that the market determines.

In this study we assume that fishfarmers can borrow from banks only when they make available some form of implicit or explicit collateral. The supply of the loan and its size are related to the certainty of ownership and value of the agricultural land which is offered as collateral. The ownership issue in aquaculture is a critical factor in lending. We note that insecurity of ownership discourages investments because the benefits which could be earned over the years become uncertain (Panatoyou, 1987) and that lack of ownership discourages pond investment and high stocking rates for a more profitable intensive culture (Bakar and Rahad, 1980). Thus, aside from the farm size issue, CARP has some implications on the ownership of fishfarms, their valuation and acceptability as loan collateral. At the same time the bank pays attention to the viability of the aquaculture project for which financing is being sought and checks on the relevant production, marketing and price parameters to determine whether a loan is feasible.

The collateral requirement acts as some sort of signalling device which enables the bank to have an estimate of the probability of loan default risk of a borrower. The type and quality of the collateral indicates information about the likely repayment by the borrower. If this collateral's integrity is impaired, the bank assumes a defensive position: it may reject the loan application entirely; ask for additional collateral or ration credit.

The bank assesses the general reputation of the loan applicant and the soundness of the project. The more information the bank has on the observable characteristics of the project ( $Pr_i$ ) and the borrower ( $B_i$ ), the more accurate will be the bank's estimate of the loan default probability.

Following Aigner and Sprengle (1968), if we have  $p$  as the subjective evaluation of the default probability for a given loan,  $q$  as the quantity of information gathered by the bank about the loan and  $L$  as the loan size, then we have an information function  $f(q, L)$  such that

$$p = f(q, L) \quad (1)$$

with the following specifications on  $f$ :

$$\begin{array}{ll} 0 \leq f \leq 1 & \\ f_q \leq 0 & f_{qq} \geq 0 \\ f_L \geq 0 & f_{LL} \geq, \leq 0 \end{array}$$

The function will depend on (a) the technological ability of the bank to produce and evaluate information and (b) the amount of previous contact between the bank and the loan applicant, embodied in the stock of prior information about and experience with the loan applicant.

In rural credit markets the severe asymmetry of information is rather well-known. The

uncertainty created by CARP worsens the situation because as earlier argued, it affects the information - giving and security property characteristics of land collaterals. The importance of  $p$  is seen in the bank's expected profit function (Lapar, 1988; Llanto and Dingcong, 1992) of the form;

$$E(\pi) = f(L, r, K, p, C/L) \quad (2)$$

where

$L$	=	size of the loan granted
$r$	=	interest rate of the loan
$K$	=	cost of lending (made up of opportunity cost of funds and transaction cost)
$p$	=	bank's subjective evaluation of the borrower's default probability
$C/L$	=	ratio of collateral to loan value, which measures the security of the loan.

In this formulation, CARP affects both  $p$  and  $C/L$ . To maximize expected profit, the bank makes a decision to lend a certain  $\mu = L/A$  where  $A$  is the loan amount requested by the borrower and  $L$  is the loan amount actually granted. The variable  $\mu$  is the bank's decision variable:

$$\mu = f(r, C/L, k, p) \quad (3)$$

The subjective evaluation  $p_i$  depends on the information about the project  $Pr_i$  and the borrower  $B_i$ . Thus

$$\mu = f(r, C/L, K, g(Pr_i, i = 1, \dots, n, B_i, i = 1, \dots, n)) \quad (4)$$

The credit rationing parameter is  $\mu$  which depends on the interest rate  $r$ , the ratio of collateral to the loan  $C/L$ , the cost of lending  $K$  and the estimated probability of default based in turn on the observable characteristics of the borrower and the project.

## CHAPTER IV METHODOLOGY AND SAMPLING DESIGN

### A. Description of Survey Area

Region VI (Western Visayas Region) our sample region, is strategically situated at the mid-section of the Philippine Archipelago. The Region can easily be reached from Manila through its administrative capital, Iloilo, by a 55-minute travel by plane or a 21-hour boat cruise.

The region covers an area of 2,022,300 hectares representing 6.7 percent of the country's total land area (Gonzaga, 1991). The 8th biggest region in the country, Region VI is composed of five provinces and eight cities. The provinces consist of Aklan, Antique, Iloilo (with Guimaras sub-province), and Negros Occidental while the cities are: Roxas, Iloilo, Bago, Cadiz, La Carlota, San Carlos and Silay. In most literature, however, the region is divided into two main geographic groups - (1) the Negros Island (the province of Negros Occidental) and (2) the Panay Island, which is constituted by the four other provinces and where the regional capital Iloilo City is found. These islands manifest similar physical features of comparatively coastal lowlands that spread inland and surrounded by wide stretches of rivers and ranges of moderately steep mountain and undulating to rolling hills. Such topographic features primarily account for the predominance of an agriculture-based economy.

The economic importance of the Region is manifested in terms of the following: First, the Region is the undisputed sugar bowl of the country producing the largest aggregate share (62%) of the total sugar output for the country's domestic need and export commitments (Department of Agriculture, 1992). Second, the Region is the second largest producer of rice with harvest averaging about 12.6 percent of the country's total rice produced. Third, livestock and poultry also exhibit prominence, with the Region contributing the second largest share (10.2 %) of the total number of carabaos in the country and 11.0 percent of the country's chicken inventory. Fourth, the Region ranks third in fisheries production with an aggregate share of 15.9 percent of the country's total. It has consistently harvested the largest bulk of the primary aquaculture products (milkfish and prawns) from 1987-1991. And fifth, Region VI is one of the few regions which enjoys economic advantages in both agriculture and mining sectors. The Region is rich in mineral resources. Copper in particular contributes a significant share in the Region's foreign exchange earnings at times exceeding those of prawns.

This host of economic advantages is supported by good infrastructure facilities. The most important of these are the ports of entry which provide good accessibility and mobility for the Region's goods and services. Air transport facilities are conveniently situated in each of the Region's four provinces. Because of these facilities, incoming and outgoing flights to and from the area are more frequent than most of the other areas outside Metro Manila. Water transport in the area is as manageable as its air transport. In every coastal town a municipal port is present to service the shipment of goods (generally, fishery products) to market centers, and to facilitate inter-island crossing. The region's, land transport is served by national and municipal

roads which are strategically constructed in the Region's major municipalities. As a result, the Region's commerce and trade have become more attractive than Manila or Cebu for investors in the south.

As of 1991, there are five National Power Corporation's (NPC) power plants providing electricity (NEDA, 1990). Three of these supply the needs of Panay and Guimaras Islands, while the remaining two plants provide the power requirements of the Negros Island. Despite these, the Region still suffers from power shortages and high power costs.

The last but equally relevant advantage is the Region's functional telecommunication system. Notwithstanding the fact that it is still underdeveloped, the communication network composed of telephone systems, radio and TV stations which are commonly lacking or insufficient in most southern regions. This communication network facilitates most importantly, the marketing of goods and services in the Region.

## **B. Data Sources**

Data were obtained from both primary and secondary sources. Primary data were collected from a field survey done from May 31 to July 28, 1992. Two surveys were conducted, to wit: the bank survey and the fishfarm operators survey. The bank survey was designed to obtain banks' reactions to the implementation of CARP. The fishfarm operator survey was used to gather data on the financing activities of the fishfarm operators and their perceptions of the impact of CARP on their operations.

## **C. Selection of the Survey Area**

Region VI was chosen as the sampling universe of the survey under the following criteria:

- Number of hectares of brackishwater ponds in operation. Between 1986-1988, Region 6 registered the highest area (25%) of brackishwater pond among the regions in the country (Table 21).
- Quantity and value of milkfish and prawn produced in brackishwater fishponds in the region. Under both categories Region VI produced the bulk of prawn and milkfish in brackishwater ponds in 1987-1991.
- Number of Fishpond Lease Agreement's (FLAs) issued in the region. As reported by the Bureau of Fisheries and Aquatic Resources (BFAR) Licensing Office, the region was issued the largest (29 %) hectarage of lands under FLA.

Considering time, manpower and financial constraints, only Iloilo, Negros Occidental,

Capiz and Aklan provinces were covered. Antique was left out of the sample because of the low incidence of fishpond operators engaging in prawn/milkfish aquaculture. The four survey areas include enough information to undertake stratification for cross-sectional analysis.

#### **D. Selection of Sample Respondents**

##### **Fish Operator-Respondent**

Stratified Random Sampling and Quota Sampling were used to draw the final respondents of the study. The former was first done to assess the characteristics of each of the sub-population (province-area) and to evaluate the extent of its heterogeneity. On the other hand, the latter permitted proportionate sampling procedure to come up with a representative sample.

Culture Type/Culture Specie, Pond Authorization and Pond Size were used as stratifying variables because these were hypothesized as the major factors that would have influential and crucial bearing on the analyses.

The first stratum, culture type, included only monoculture method of milkfish and prawn. Fishpond operators employing polyculture method were excluded in the sample since they only represent 10% of the total pond owners in the country. Furthermore, only culture of prawn and milkfish was included because culture of species other than these two, represents only a relatively insignificant group composing 13% of the total pond operators. Putting more weight on these two, the categories defined would sufficiently account for the majority of the samples.

A listing of the surveyed fishpond operators (Non-FLA and FLAs) in Region VI was provided by the Department of Agriculture (DA)-PMO ADB Fisheries Sector Program. This list served as the sampling frame list of the survey where stratification was also done.

Two pond authorization categories were defined, to wit: the Non-FLA (Privately-owned), this referred to titled fishpond areas owned by private individuals or corporations; and the FLA, which referred to ponds operated under a contract entered into by and between the Secretary of Agriculture and/or Natural Resources and the qualified applicant for the development and utilization of public lands for fishpond purposes.

The third stratum, pond size, included two exclusive groups, correspondingly, the small-medium pond and the large pond. The measure of the pond size was based on the specie being cultured.

A simple random sampling with a fixed percentage was not possible due to

uneven distribution of fishpond operations in the four areas along the stratifying variables. Consequently, the Simple Random Sampling (SRS) of  $n=30$  from each of the last stratum (pond size) was changed to a quota sampling design. This sampling scheme considered the actual distribution of the fishpond operators in the population. In the process, the effect of the skewed distribution was reflected by the chosen sample.

The actual steps undertaken in the sampling procedure are as follows:

1. Region VI was selected using purposive sampling.
2. BAS reports on brackishwater prawn and milkfish production and the BFAR list on issuance of FLAs were evaluated.
3. Four areas were selected using purposive sampling.
4. After the 4 areas were selected, a list of fishpond operators was generated for each of the area. The list which was provided by the FSP-PMO Aquaculture Division, stratified the fishpond operators (FO) as to address, size of pond, culture type, culture specie, pond authorization, province.
5. Within each province (for the 4 areas), the FOs were further stratified by municipalities. The frequency distribution of the FOs by municipalities was evaluated. The municipalities were ranked according to the number of FOs by pond authorization, pond size, culture specie, in descending order.
6. A final sampling frame list (for each of the area) was generated by integrating the FOs listed under the first five and six high ranking municipalities with respect to pond authorization. The number of samples to be drawn from each of the municipalities was determined by examining the percentage share of FOs in the first five and six high ranking municipalities in the actual population. The number of samples to be drawn from each area (province) was determined in the same manner. The sample was drawn using simple random sampling. A total of 255 sample respondents were selected. Only 241 respondent, however, were interviewed since some of the respondents were not willing to give information on their operations. The frequency distribution of fishpond operator-respondents is shown in Table 22.



## **Banking Institut**

The selection of the banking-institutions-respondent was done in a similar manner.

First, a list of all banks operating in the selected areas was taken from the Central Bank. As of December 1990, there were 258 banks in the region consisting of 110 commercial banks, 24 thrift banks, 116 rural banks and 8 specialized government banks.

To identify the sample banks, letters were sent to these banks inquiring on their credit portfolio for 1990-1991. As expected from a mail survey, less than 20 percent of them sent back the information sheet which reflected the number of loan accounts of the aquaculture sector (prawns and milkfish). From among them, 15 percent reported no credit portfolio for prawn or milkfish aquaculture loans since 1990. A list was then generated from the 85% with affirmative answers. Eighteen banks with the most number of aquaculture loans in the area were selected as samples. The sample distribution by bank type is shown in Table 23.

## **Borrower-Respondent**

From each of the sample banks, account level information was obtained from randomly selected borrower's account. The sample accounts selected from each of the sample banks were drawn using, again, the two sampling techniques used in drawing the other groups of respondents - the stratified and quota sampling. The stratifying variable used was the Borrower Type. This included the categories: Fishfarmer and Agricultural Borrowers. As in the case of the fishpond operators and the banking institutions, the use of the quota sampling scheme guaranteed the adequate representativeness of areas and banks which reported the most number of aquaculture loans granted in the sample. Table 23 shows the distribution of the 345 sample borrowers by bank and loan type.

## **E. Hypotheses and Analytical Methods**

Agrarian reform has significant impacts on the credit markets in the aquaculture sector. One impact is the way banks view the acceptability and sufficiency of aquaculture farms as a collateral which determines to a large extent the availability of bank credit. Another impact is the possible effects of CARP on the viability of the aquaculture production. Two major issues are thus raised. First, the extent to which agrarian reform in the aquaculture sector will affect production and profitability in that sector which will be of major interest to the banks; and second, the extent to which agrarian reform will influence the banks' lending decisions and fishpond operators' demand for different financing scheme.

We submit the following hypotheses:

- (1) Under agrarian reform banks tend to put a lower collateral value on fishponds;
- (2) With agrarian reform banks tend to become highly selective in the type of fishpond projects to finance;
- (3) Under agrarian reform regime banks would tend to credit ration fishpond operators which offer aquaculture lands as collateral;
- (4) Agrarian reform will constrain aquaculture production which could create further constraints the fishpond operator's access to bank credit.

Descriptive and regression analysis are used to test these hypotheses using data gathered from both the banks and fishpond operators. We estimate credit rationing using borrower account data and a Cobb-Douglas Production function using fishpond operators' data.

### Credit Rationing Model

The credit rationing model uses a qualitative-response model which is actually a test for the incidence of rationing ( See Lapar, 1988). Credit rationing by banks occurs after the loan has been processed and approved and the manager decides on the maximum amount of loan to be granted to the borrower.

The model is of the form:

$$\mu = f(b_i X_i)$$

where  $\mu$  takes the value of 0 when the ratio of the amount of loan granted (L) is less than the amount of loan applied for (A), that is,  $L/A < 1$ . If  $L/A = 1$  then  $\mu$  takes the value of 1. The explanatory variables are:

- |    |   |  |
|----|---|--|
| X1 | = | a dummy variable on the type of borrower   |
|    | = | 1 if fishpond operator and 0, otherwise  |
| X2 | = | a dummy variable on the type of bank   |
|    | = | 1 if a private bank (e.g., Commercial Banks, Private Development Banks, Rural Banks) and 0, otherwise, i.e., a government bank (e.g., LandBank, Development Bank of the Philippines) |
| X3 | = | market value of borrower's assets  |
| X4 | = | size of agricultural land mortgaged  |
| X5 | = | size of fishpond area mortgaged  |

- X6 = size of residential and commercial lots mortgaged
- X7 = bank interest rate
- X8 = appraised value of chattel collaterals

In this model, the probability that a borrower will be rationed depends on  $X_i$ , a vector which includes such variables as type of borrower, type of bank, market value of borrower's assets, size of fishpond area, size of residential and commercial lots, interest rate and value of chattel. A logit regression model was used to estimate this model.

### Cobb-Douglas Production Model

The Cobb-Douglas Production function is the most common functional form in production economics. This function has also been used in the input-output studies on aquaculture particularly milkfish (Chong, 1982; Lizarando, 1984). In the study, we used it to infer possible effects of CARP on the viability of aquaculture production.

The algebraic form of the Cobb-Douglas production function is:

$$Y = A\pi X_i^{b_i}$$

where  $Y$  is gross output,  $X_i$  is the  $i$ -th input,  $A$  and  $b_i$  are the parameters. The parameter  $b_i$  the elasticity of output for the  $i$ th coefficient and the sum of the  $b_i$ 's is the scale elasticity of the production function. If  $\sum b_i < 1$  then there exist decreasing returns to scale; if  $\sum b_i = 1$ , then there exist constant returns to scale and if  $\sum b_i > 1$  then there exist increasing returns to scale.

### **F. Limitations of the Study**

Time, budget and manpower constraints limited the coverage of the study to the Western Visayas region. While the profit maximizing functions of banks tend not to be greatly affected by locational diversities, geographic and topographic differences among regions may bring about significant differences in the production activities of fishpond operators and their behavior with regard to financing.

The unwillingness of some banks to be interviewed and to allow access to bank records further limited the sample size which created constraints in the statistical estimations that are undertaken. The problem of respondents' unwillingness to be interviewed is greater among fishpond operators specifically the large operators.

Except for the data obtained from the borrowers credit files, most of the information

gathered are based on the bank managers' or fishfarmers' ability to recall information. Data are, thus, subject to a number of measurement errors. Further there is a tendency especially among some fishfarmers to overstate or understate production or any information related to their financial positions.

The regression models used in the analysis may also be subject to error. The exclusion of other explanatory variables in the equations will result in biased estimators.

## CHAPTER V

### FARMING PRACTICES, FINANCING ACTIVITIES AND PERCEPTION OF CARP BY SAMPLED FISHPOND OPERATORS

This chapter describes the production and financing activities of the sample fishpond operators in Region VI. The views of the fishpond operators with regard to the effect of CARP on their access to both formal and informal credit are presented.

#### **Fishpond Areas**

Fishpond areas in Region VI are either leased or owned by the operators. Leased areas are lands rented from the government at P50/hectare/year for a maximum of 25 years<sup>3</sup>. A fishpond lease agreement (FLA) is a contract between the government and the lessee which allows the latter to use the piece of land for aquaculture activities. According to the Bureau of Fisheries and Aquatic Resources (BFAR) 1989 survey, 24.1 percent of fishpond areas in Region VI alone were leased and the rest are privately-owned. The land rented from government are basically mangrove areas. With the recent moves to conserve mangroves and prevent their conversion to fishponds, the issuance of FLAs on public lands has been limited to existing FLA areas. At present, the shift is towards the conversion of ricelands and sugarlands into fishpond areas. This has been particularly observed in the province of Negros during the mid-80s when the export potential of the prawn industry was at its height<sup>4</sup>.

Sixty percent of the sample fishpond areas are privately -owned lands where either prawns or milkfish are propagated (Table 24). The practice of monoculture is basically prevalent in the region although polyculture is a common practice in Aklan and Capiz. Average land sizes range from less than a hectare to 500 hectares with comparatively larger fishpond areas being privately-owned farms (Table 25). Prawn culture is also noted to be less land intensive than milkfish culture among privately-owned farms<sup>5</sup>. The largest prawn farm is only one-fifth the size of the largest milkfish farm in the area. Based on area distribution, the fishpond operators in the region are generally medium-scale producers with average fishpond

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<sup>3</sup>In the past the tidal mangrove areas were generally considered wastelands with no significant economic and ecological value. Hence, government-owned mangrove areas were made available to potential fishfarmers at a nominal rate. Recently, because their economic importance is now recognized, there are moves to increase the rental for these areas. The proposed initial fee is P2,250/ha/year (Schartz, 1990).

<sup>4</sup> One can also speculate that the shift is motivated by the 10 year deferment of CARP in aquaculture areas.

<sup>5</sup> Land intensive culture is not significant among FLA operators since their capacity to expand ponds is dependent on government regulations.

areas of about 25 hectares for milkfish and 20 hectares for prawn.

However, unlike traditional crop cultivation, land size alone will not give a complete picture of the scale of operations in fishpond culture. The level of intensification<sup>6</sup> adopted has a major implication on the scale of the enterprise. For instance, a 5 hectare prawn farm that employs an intensive culture method is relatively of a larger-scale operation compared to a 20 hectare prawn farm using a traditional or extensive culture method. Fishpond operators with larger fishpond areas tend to use lower technology packages as compared to those operators with smaller areas.

Fishpond operators generally do not utilize the total fishpond area for productive purposes. On the average, only about 91 percent of milkfish area and 85 percent of prawn area have been developed (Table 26). Some farms (about 10 percent of the sample) have developed only half of their total fishpond area. Insufficiency of funds was the major reason cited for the fishpond operators' inability to develop their fishpond areas (Table 27). A second reason was the unsuitability of the area which stems from factors such as peace and order situation, inaccessible location, high salinity and lack of tidal water.

### **Farming Practices**

The basic equipment usually owned by the operators include harvesting nets, tests kits, motorized bancas, water pumps, generators and aerators or paddlewheels. Investments in these type of machinery/equipment are at the barest minimum even among large farms (Table 28). Some farms even survive with only harvesting nets and tests kits.

The sample fishpond operators exhibited diverse farming practices ranging from small traditional subsistence practices to large highly-capitalized farming techniques using expensive inputs. Most milkfish growers employ the traditional and extensive culture method while prawn growers use generally semi-intensive techniques (Table 29). The more intensive culture method adopted by prawn growers is due to the more complicated production processes required for prawn growing and the need to meet the quality standards in the export market. In privately-owned fishponds, operators tend to be more aggressive in adopting higher technology packages than operators who are FLA holders. Only a few FLA holders adopt an intensive method compared to those operators who own the fishpond.

While fishpond operators have different input mixes, the most common inputs used in addition to fingerlings/fries and labor are feeds, fertilizers and lime. Traditional operators limit usage of inputs to a minimum. Only a few pieces of fries or fingerlings are seeded for every hectare of fishpond area and fish food is mainly obtained from a natural source (e.g., "lablab") whose growth is promoted through fertilization. In some cases fertilization is not necessary

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<sup>6</sup> Intensification refers to the extent of utilization of supplemental feeds and fertilizers, as well as the level of development of the fishpond.

especially in fishponds where natural food is abundant. Commercial feeds are used as supplementary food and trade-offs between fertilizer and feeds are common although the extent of their substitutability has not yet been determined.

Prawns requires a higher level of technology package than milkfish. For instance, while a traditional milkfish operator can simply depend on natural food for milkfish, a traditional prawn operator still has to provide a significant amount of feeds for prawn growth. Because prawns are more sensitive to environmental factors and the pond's physical conditions than milkfish, operators make relatively bigger investments for pond preparation, maintenance availability of feeds and fertilization.

Operators who adopt the extensive culture method have an average stocking rate of about 10,000 pieces per hectare of milkfish fry or 27,641 pieces of prawn fingerlings per hectare. Feeds and fertilizer are used and labor utilization is higher than the traditional practice.

There is direct relationship between the stocking rate and level of utilization of feeds for both milkfish and prawn production. As the level of intensification becomes more sophisticated, a higher quantity of feeds is required. The amount of fertilizer inputs on the other hand, is dependent on the relative productivity of the natural food that exist in the fishpond area. Fishpond operators maximize such productivity before they adopt more intensified operations. The use of pesticides and lime have no discernable pattern among traditional, extensive or intensive culture method primarily because usage of such inputs largely depends on the physical condition of the fishpond and the salinity level of water.

#### Input Cost, Level of Production and Profitability

Fingerlings/fries, feeds and fertilizer account for the bulk of expenditures incurred in aquaculture production. Repair and maintenance costs as well as salaries and wages are the next major expenses. Expenses on loan amortization are only less than one percent of total operating expenses.

On the average, feed cost is 25 percent of total expenditures (Table 30). The proportion is specifically higher for prawn growers whose expenditure on feeds accounted for 41 percent of their total expenses. For milkfish growers, fries represent a bigger expense than feeds or fertilizers. Unlike prawn growers, milkfish farmers are highly dependent on natural food which explains the importance they place on fertilizer rather than on feeds. The proportion of expenditure for fertilizer is similar regardless of the ownership of the fishpond.

In peso terms, the average input cost per cropping per hectare is higher in prawns production than in milkfish production (Table 31). Average input cost for milkfish and prawns production is P20,103 and P68,681 per hectare, respectively. Under both species, privately-owned fishpond operators have higher expenses than FLA holders. Further, increasing cost is noted as fishpond operators apply more intensive culture (Table 32). Between the traditional culture method and extensive method, average costs differences per hectare per cropping is

P1,000 for milkfish and prawns.

The higher cost incurred by more intensive culture, however, results in significantly higher productivity of fish farms (Table 33). This implies increasing returns to scale that was validated by the results of our estimation of the Cobb Douglas production function.<sup>7</sup> Prawn growers, show significant yield differences of 68.7 percent between traditional and extensive; more than 200 percent between extensive and 48 percent between semi-intensive and intensive culture. Further, privately-owned fishpond show higher productivity than leased areas. This is partly a result of the higher usage of production inputs and better pond management and maintenance. Yield differences between culture methods in milkfish production are likewise significant with higher intensive culture producing higher levels of production. On the other hand, a highly intensive culture method, however, does not seem suitable for milkfish production. It seems that the intensive method results into lower profits for milkfish cultivation compared to the semi-intensive method. The incremental output realized from using a highly intensive culture method in milkfish production seems not sufficient to cover the additional costs incurred. Hence, only a handful of fishpond growers in Region VI use an intensive culture for milkfish. On the other hand, privately-owned milkfish farms have a higher level of production than FLAs.

Compared to palay or corn farming, fish farming seems to generate a higher profitability per hectare of cultivated land. On the average, profits per hectare per cropping for milkfish range from P10,000 to P133,646 (Table 34). Profits for privately-owned farms are comparatively higher than those from leased farms.

Prawn culture showed higher profits than milkfish culture. While average production and input costs for prawn do not differ much from milkfish, the export potential allows prawns to obtain a significantly higher price than milkfish. Table 35 would show that 50 percent of harvested prawn are exported. In contrast, 60 percent of milkfish are sold in the local market. On the average, a relative price ratio of 4.4 is common implying that prawn price is about 4 times higher than milkfish price (Table 36). Thus, while average production cost of prawns is 50 percent higher than for milkfish, average profit for the prawn grower is still 40 percent higher. Between FLAs and non-FLA operators, higher profits are observed for the latter.

While profits in fishfarming seem to present a glowing picture of the milkfish and prawn industry, productivity levels are still considered low. Potential average yield of milkfish in the country is about 3 tons per cropping (Chong 1982 ) and 8 tons per cropping for prawns (Auburn University, 1992). Some operators are able to approximate this yield potential but the majority of fishpond operators have below par production levels. There are varied reasons for this but a large number of operators have identified limited operating capital as a major constraint (Table 37). It seems that the lack of credit to finance the operating capital requirements is a binding constraint to the attainment of maximum yield especially as average yield in the Region for both

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<sup>7</sup> Discussed in Chapter VII.



milkfish and prawn is 50 percent lower than the potential yield. Weather problems and low price of produce are the other important problems mentioned. Both these problems reflect the vulnerability of production to natural calamities and the prevailing market situation.

### **Financing and Credit Activities**

Fishfarm operators financed their capital requirements from their own funds and from borrowings. On the average, 71.6 percent of the total capital required is sourced from their own funds (Table 38). This proportion applies to both FLA and non-FLA as well as to milkfish and prawn operators. The profits generated from operating the fishfarm are in most cases plowed back to the business although there are cases when profits obtained from other business undertakings are the ones used to augment the capital requirements of fishfarming (Table 39). Loans are obtained by the fishpond operators from formal and informal lenders primarily for working capital requirement (Table 40). Pond development and expansion are also a major reason for seeking financing especially among prawn growers.

Informal lenders mostly input dealers are the major source of credit of the fishpond operators in general. Fishfarmers enjoy credit and deferred payment facilities from these lenders. Private fishfarm operators, however, have better access to bank credit compared to FLA operators as indicated by the larger proportion of financing obtained from banks. The private fishfarm operators also borrow from the input dealers but they have lower informal borrowing compared to FLA operators. Private ownership of the fishpond makes these non-FLA operators more attractive to banks than FLA operators. It may also be that since these private operators use more intensive culture, their working capital needs can not be sufficiently satisfied by informal lenders, hence, their dependence on bank credit.

For the last five years, the average loan amount granted to the sample fishpond operators is P1.5 million at an annual interest rate of 19 percent and a maturity of 5 years (Table 41). In general, fishpond loans are given longer maturities than crop loans since most of these loans were contracted both for short-term working capital and long-term pond development and rehabilitation. There is not much difference in the maturity term of the loan between milkfish and prawn operators. However, between FLAs and non-FLA operators, the former are given a longer maturity period.

Such differences may arise depending on the source of funds used by the bank to finance the loan. Loans to FLA operators are funded from special credit programs (e.g., ADB Aquaculture Loan Program, Fisheries Sector Program) and banks have to conform with the maturity period stipulated by the credit programs. With regard to interest rates, both FLA and non-FLA operators are charged similar rates. This results from the financial reforms which eliminated subsidized interest rates in agriculture. Prawn operators are charged a rate that is 3 percentage points higher than the rate given to milkfish operators because of the higher investment risks in prawn culture.

Banks require acceptable and sufficient collateral. At the minimum, real estate mortgages

are required. Table 42 shows that the loans of the fishpond operators have been collateralized by non-agricultural real estates and fishpond areas. While some loans have been collateralized by FLAs, banks do not consider the lease agreements as sufficient collateral<sup>8</sup> hence, additional collaterals are required. The high collateral requirement of the banks, however, does not seem to discourage fishpond operators from obtaining a loan from banks. What discourages them to apply for a bank loan is the high rate of interest charged (the prevailing interest rate at the time of the survey is between 24% to 28% per annum) and "red tape" in the processing of loan application (Table 43). The latter, in particular, translates into delays and higher transaction costs for the fishpond operators. The average borrowing cost (including opportunity cost) for the fishpond operator is P1.48 for every thousand pesos loaned (Table 44). The borrowing cost of FLA operators is 4 times higher than that of non-FLA holders. This condition arises because loans sourced from government special credit programs funds seem to require a longer processing time.

The informal sources of credit are mainly the input dealers, exporters and wholesalers. The most common credit arrangement with input dealers is deferred payment where the fish operator pays the cost of inputs upon harvest (usually after 3 months). Credit of this form is generally extended by big corporations (e.g., San Miguel). Exporters and wholesalers are also major sources of informal loans. These lenders provide the production inputs and require a marketing tie-up with the fish operator. Other informal loan sources include the registered money lenders such as pawnshops, cooperatives and non-bank financial intermediaries (NBFIs). A sample of the terms and conditions of the loans contracted from informal sources are presented in Table 45. Borrowings in cash and in kind averaged about P800,000 in the last five years. The amount borrowed by FLA holders and milkfish operators are relatively lower than the loans granted to non-FLA holders and prawn operators. The loan terms imposed by informal lenders seem relatively less stringent than those by banks. Collaterals are not generally required by informal lenders.

However, operators who borrow from pawnshops and NBFIs have to support their loans by collaterals. The collaterals required are comparatively of lower value compared to those demanded by the banks. Further, only a handful of the loans granted by the informal lenders are with interest (mostly those granted by the registered moneylenders) and the level of annual interest rate is 10 percentage lower than the interest rates given by banks. Borrowing from informal sources is also less costly than obtaining a bank loan. Average transaction cost including opportunity cost of time is only 81 centavos per thousand pesos, about 50 percent lower than the transaction cost of borrowing from banks (Table 46). Whether the operator borrows for milkfish or prawn purposes, the transaction cost does not significantly differ. However, the transaction cost of non-FLA holders is 50 percent higher than that of non-FLA holders. This may be attributed to the more expensive transport facility used by non-FLA and the higher estimate of their cost of time.

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<sup>8</sup> Please refer to Chapter VI on bank credit rationing behavior.

### **Fishpond Operators Perception on CARP**

The fishpond operators like bankers also have varied reactions with regard to CARP's effect on credit access. A number of operators (42 percent) in particular, of FLA holders and milkfish growers perceived that CARP has reduced access to bank credit (Table 47). This effect is indicated primarily by the unacceptability of fishfarms as collaterals (Table 48). Unlike the previous land reform program which affected only rice and corn lands, the CARP's more comprehensive coverage includes fishfarms among the "unacceptable" type of bank collaterals. Banks have either stopped lending to aquaculture farms or limited the maximum loan value to 5 hectares based on the land ownership limit imposed by CARP.

There are important implications of the above reactions. First, CARP would seem to limit the potential for expansion or more integration of fishfarming. In Negros Occidental, for instance, before the CARP there were proposals for 100 to 200-hectare integrated prawn farms (i.e., hatcheries, feed mills grow-out ponds, processing plants) but these were shelved when CARP was implemented because local bankers who would partly finance the ventures were not willing to risk loans for aquaculture development (Lacson, 1987). Second, while a higher stocking rate would increase production per hectare of land, an optimal stocking rate exists which varies according to the size of the pond and by type of species depending on salinity conditions, age of pond and the size of fish that the operator may want to produce. Production potential is to a large extent determined by operators' access to credit. However, reduction of fishfarm areas will affect not only fishfarm size but access to bank credit.

On the other hand, 57 percent of the fishpond operators expressed that CARP has not affected their access to bank credit. Basically, these operators have not yet felt the impact of CARP because they have not attempted to obtain a loan from the bank since the CARP was passed into law (Table 49). Other operators believed that CARP would have no effect since banks do not lend on the basis of size of fishfarms alone. They believed that banks give primary concern to cash flows and other personal guarantees of the borrower. This view appears to be consistent with those expressed by some banks.

On the other hand, CARP would not significantly disrupt access to informal loans since transactions in the informal markets do not depend on the availability of land collaterals (Table 50). Interlinking arrangements (e.g., patronage, marketing tie-up) are basic considerations for the informal transactions in aquaculture credit markets.

## CHAPTER VI

### CREDIT RATIONING BEHAVIOR OF BANKS UNDER CARP

This chapter discusses the lending behavior of banks towards fishpond operators upon consideration of CARP. Specifically, issues on CARP's impact on the acceptability and sufficiency of aquaculture farms as collateral for a loan is discussed. It also presents the banks' perception of CARP's effect on the viability of the industry.

#### A. Bank Level information

**The Sample Banks.** The bank survey involved 18 sample banks from Iloilo, Capiz, Aklan and Negros Occidental. This number represents 7.0 percent of the total number of banking institutions in the Region in 1990. The number of banks selected per province is distributed unequally since the banks were chosen based on their loan exposure to aquaculture. There were 7 banks in Iloilo, 2 in Capiz, 3 in Aklan and 6 in Negros Occidental (Table 51). The banks interviewed were mainly commercial banks. The other banks consist of 5 rural banks, 3 Land Bank Field Offices, 2 branches of the Development Bank of the Philippines and one private development bank.

Most of the sample banks have been operating in the locality for about 15 years (Table 52). The branches of the Development Bank of the Philippines have been in the locality the longest. The Land Bank Field Offices, on the other hand, are relatively new having been in operation for barely two years. Among the sample banks, the private banks (i.e., PKBs, PDBs and RBs) have the most number of deposit accounts while government banks (i.e., LBP and DBP) had the least. On the average, private banks have about 10,000 depositor accounts per bank as compared to DBP's 2,157 accounts (LBP-FO have no deposit-generating function). This condition reflects the efforts that private banks devote to deposit mobilization compared to that of government banks. The reverse however, occurs with regard to borrower accounts. PKBs have the least number of borrower accounts amounting to only 185 accounts. In contrast, Land Bank and DBP have 835 accounts. Rural banks and the lone private development bank have a larger number of borrower accounts than LandBank and DBP due to the concentration of their operations in the rural areas and their very limited funds transfer capabilities.

The number of aquaculture loans as of 1991 is noted to be minimal for all banks. On the average, this represents only 5 percent of the total number of borrower accounts. A large portion of the portfolio of the sample banks had been allocated to non-agricultural or agricultural- non-fisheries accounts. PKBs, PDBs, and DBP have about 83 percent of their loan portfolio in non-agricultural projects. On the other hand, the bulk (85.3 %) of loans granted by RBs and LBP Field Offices were for agricultural non-fisheries projects.

**Banks' Exposure to Aquaculture.** For banks' lending to fishpond operators, it is observed that there is no significant difference in loans to bangus or prawn culture. Most of the banks which granted loans to bangus operators also extended financing to prawn operators. The

three banks who had no exposure to prawns were generally constrained by the following factors: (1) the limited funds for prawn projects; (2) the non-existence of prawn farms in the area; and (3) prawn farms in the area are owned by large farmers who are not among the bank's targeted clientele. It appears from the reasons cited that constraints to prawn financing does not solely revolve on issues regarding CARP or viability of operations but whether or not there are financeable prawn or bangus projects in their areas of operation. It seems that banks still accommodate fishpond operators despite the pressures and uncertainties brought about by CARP.

**Credit Rationing Behavior.** The incidence of credit rationing is observed to be greatest for aquaculture loans compared to the non-aquaculture loans (Table 53). For instance, the number of rejected applicants among fishpond borrowers is the highest (80.6%) for all banks except for the lone private development bank, where the extent of credit rationing is highest for other agricultural borrowers. Non-agricultural loans have the highest mean percentage approval for all banks. Selection biases for the aquaculture sector may be implied from these results. While the rejection rate for fishpond loans may be high for the year in review, it is possible that the banks have displayed similar biases even prior to the CARP.

The extent of rejection is further observed to differ among banks with the LBP-Field Office having the most number of rejected applicants. This is followed by PKBs and RBs in that order. The low level of acceptance especially among the rural banks maybe due to their limited funds which is not sufficient to finance highly capital intensive projects. Meanwhile, the PKBs may have the finances but are overly-cautious with regard to investments in fishpond projects.

Loans for aquaculture purposes have been rejected by banks mainly because the borrowers failed to satisfy the banks' minimum requirement on borrowers' reputation, project viability and project riskiness (Table 54). The latter two conditions have not been a major factor for rejecting loans to non-agricultural sector and to some extent with non-aquaculture projects. It appears that the occurrence of business failures tends to be higher for aquaculture.

**Collateral Requirement and Sufficiency.** All the sample banks are observed to accept both agricultural and non-agricultural real estate collateral. The loan value of both types of collateral is likewise not significantly different at 60.9 percent and 60 percent for non-agricultural and agricultural collateral, respectively (Table 55). The banks seem to have lesser confidence in agricultural lands which they consider to be insufficient collateral (Table 56). While 65 percent of the sample banks would not require additional collateral for loans supported by non-agricultural properties, 75 percent of them would need one for loans supported by agricultural lands. The additional collateral acceptable to the banks includes among others building, equipment and vehicles, as well as deposits and bonds.

The PKBs and one lone DBP interviewed mentioned that agrarian reform lowers the attractiveness of farmlands as collateral. One may argue that there are banks requiring additional collateral even for loans supported by non-agricultural real estate collateral. Such condition however is a standard requirement of the bank rather than a policy effect. Fixed assets financed by banks are in general mortgaged to the banks until the loan is fully paid.

Further, banks require additional collateral as additional loan security. As one bank has succinctly stated "banks are not real estate institutions interested in speculating with real estate prices but rather are financial institutions whose main concern is debt payments on time". Having more assets mortgaged thus, would increase the probability of loan repayment.

The banks refused to accept as collateral those instruments that have been generated out of government programs e.g., fishpond lease agreements, credit guarantees, emancipation patents, certificate of land transfer. Holders of these instruments who use these instruments as security or collateral will thus find it difficult to get loan approval. The common reasons for loan disapproval are: (1) impediments due to legal restrictions; (2) lack of resale value of the "instrument"; (3) properties remain public property and therefore have no value as a collateral (Table 57).

**Other Loan Requirements.** In addition to collateral requirements, banks also imposed other important conditions prior to approval. First is the equity-loan-ratio which determines the extent of own investment the borrower has put into the project to be financed. This ratio differs by type of bank but requiring equity from borrowers is standard for all types of loan. The lone private development bank has the highest equity requirement of 70 percent (Table 58). This is followed by PKBs (51%) then rural banks (35%). Government banks have the lowest equity requirement of about 23 percent. The high ratio imposed by PKBs and the lone PDB implies that these banks tend to finance projects in which borrowers would invest more of their resources. Risk of non-repayment will be minimized since the borrower would have contributed a significant portion of his own money into the business. On the other hand, the lower equity required by government banks implies that they stand ready to finance projects at their development stage and they are more ready to take lending risks.

Most banks also have a minimum and maximum loan size requirement per borrower. The latter is generally determined by the bank's single borrower limit. The former depends upon the type of bank and the type of loan to be financed. Aquaculture projects are observed to have the lowest minimum loan size requirement, in particular, those on milkfish culture (Table 59). The minimum loan size required by PKBs is over a million pesos for aquaculture projects and over P2.0 million for agriculture and non-agriculture projects. The loans granted by PKBs per borrower is the highest among all banks. Private development banks and the rural banks have the lowest minimum size requirement.

**Banks' Views on CARP.** The bank managers have a high level of awareness of the CARP. Ten of these managers mainly from privately-owned banks expressed negative views on CARP (Table 60). The manager from a government bank also expressed the same sentiments. Four banks mainly PKBs, on the other hand, find CARP to have no significant effect on their operations. Positive views were expressed by the LBP-Field Offices.

The negative perception of CARP results from the loss of collateral value of agricultural lands as collateral (Table 61). This implies that borrowers who possess only agricultural lands for collateral tend to be credit rationed. Rationing may come in various forms: First, by

limiting the acceptance of agricultural lands as collateral; Second, by lowering the loan value of the agricultural properties and third, by limiting loan value commensurate to the maximum retention of hectares under CARP.

The four banks who indicated that CARP had no effect on their operations presents some explanations (Table 62). The private commercial banks, in particular, do not consider CARP to have a major impact on the credit markets for aquaculture since their clients have other collateral to offer. Secondly, the borrower rather than his collateral is the primary factor in loan repayment. And third, the viability of aquaculture projects is a function of other factors such as technology. The two rural banks who likewise expressed the same sentiments believe that CARP has a minimal impact on the acceptability of fishfarm or farmlands as collateral since their clients also have other small landholdings.

Bank managers were also asked what financing schemes would be appropriate for aquaculture. The majority of the privately-owned banks expressed the need for a preferential credit scheme for the sector either through the following: (1) a rediscounting facility; (2) a specialized loan fund; and (3) subsidized credit via lower interest rates (Table 63). It is not clear from their replies whether these schemes are CARP-induced or are long standing demands of the banking industry.

**Loans Granted to Fishpond Operators.** Volume-wise, loans to the aquaculture sector have been increasing in real terms at the rate of 29.2 percent since 1986 to 1991 (Table 64). The value of such loans has also increased by 13.3 percent annually in real terms during the same period. The increase in the number of fishpond operators that has been granted loans in the last five years is indeed high considering that it matched the increase in the number of non-agricultural borrowers and surpassed the increase in the number of agricultural borrowers by eight times. However, the comparatively lower increase in the value of fishpond loans relative to that of agriculture and non-agricultural loans suggests some degree of conservatism in the amount of loans given to fishpond operators because of perceptions about CARP and the relative riskiness of aquaculture ventures. This finding further implies that banks shy away from financing expansionary or developmental activities of aquaculture due to its high capital requirements. Banks' own funds appears to have been used mainly for working capital requirements. If ever developmental projects are financed these are generally funded from special credit programs for instance, the Central Bank-ADB Program, the SSS-Kasapi Program.

## **B. Account Level Information**

**The Sample Borrowers' Accounts.** The sample consists of 325 fishpond and other agricultural borrowers categorized as follows: 20 fishpond FLA borrowers; 193 Fishpond non-FLA borrowers and 166 other agricultural borrowers (Table 65). A large proportion of the sample fishpond borrowers comes from the private commercial bank and DBP. Agricultural borrowers, on the other hand, are mainly from Land Bank-Field Offices and the rural banks.

**Profile of the Sample Borrowers.** Most of the borrowers belong to the middle income bracket with an average annual income of P100,000 to 300,000 (Table 66). A significant number of these borrowers belong to the high income group with average annual income of over P3.0 million. The monied class is mainly composed of fishpond non-FLA borrowers who are generally clients of private commercial banks and the branches of the Development Bank of the Philippines.

**Collateral Offered.** All of the sample borrowers have mortgaged some properties as collateral for their loan. About 82 percent have offered land as collateral while the rest, mostly borrowers of LandBank-Filed Office have offered chattel mortgages (Table 67). Residential lots appear to be the main collateral offered. This is observed among all types of borrowers. For instance, 16 percent of the FLA holders have used residential and commercial lots to support their loans. Like fishpond areas, the use of croplands as a collateral is also found to be equally lower than the non-agricultural lands. This bias against farmlands is highly evident among the bigger banks (e.g., PKBs and DBP) than the smaller banks (e.g., RBs and PDBs). Only LandBank Field Offices have not been very particular on land collateral.

**Credit Rationing.** Credit rationing<sup>9</sup> can also be measured in terms of the amount of loan granted vis-a-vis the amount of loan applied for. This is referred to as quantity rationing. Results of the estimated logit model using borrowers' account data show that there is a higher incidence of quantity rationing among fishpond borrowers than agricultural borrowers (Table 68). The probability of a fishpond borrower being rationed is 11.4 percent compared to 7.27 percent for the other agricultural borrowers. In particular, the FLA holders are noted to be the least preferred clients of banks. Of the FLA borrowers who were granted a loan, 35 percent received loans lower than what they applied for (see Table 65). This proportion is 4 and 4.5 times higher than the extent of quantity rationing among non-FLA and agricultural borrowers. This condition occurs even when the collateral offered by most (61 %) of these FLA holders are non-agricultural lots as compared to the non-FLA borrowers whose loans are mainly (54.4%) supported by croplands and fishpond areas (see Table 67). This reaction is typical of the credit behavior of banks with regards agricultural borrowers. Land ownership is a pre-condition imposed by banks as this reflects on the marketability and ease of transfer of ownership rights. Therefore conditions that create uncertainties on ownership on agricultural land or any real estate properties for that matter lower their collateral value.

The credit rationed borrowers are mainly those who borrow for the purposes of pond improvement or development (Table 69). This apprehension of banks over expansion programs has far-reaching implications on the growth of the industry which maybe a result of uncertainties due to CARP or uncertainties on the potential of the aquaculture industry, in particular, prawns. Rural Banks and the Development Bank of the Philippines are the major banks with the highest number of rationed fishpond borrowers. These banks have become highly selective of fishpond

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<sup>9</sup> Strict credit rationing occurs when loan applications are outrightly rejected. We failed to get this type of information because the banks did not keep a record of rejected applications.



borrowers notwithstanding the fact that these banks have the highest number of loans granted to the aquaculture sector in the past. On the other hand, the other banks have rationed more agricultural borrowers than fishpond operators. It can not, however, be determined whether this signifies preference for fishpond operators since the possibility of an outright rejection of fishpond operators can not also be ruled out.

The outright rejection of fishpond operators may likewise explain the insignificance of the size of land offered as collateral on the credit rationing behavior of banks. At the onset, certain types of borrowers are already rejected and therefore, second stage rationing (i.e., quantity rationing) does not apply.

The level of interest rate is a significant factor for quantity rationing. A higher interest rate lowers the incidence of quantity rationing. This is because the higher interest rate would allow the bank to have a wider spread to capture the effect of a higher risk of aquaculture ventures.

The value of the borrower's assets and the value of his collateral are likewise significant factors. The positive relationship between value of assets and credit rationing indicates that the higher the value of assets the higher is the incidence of rationing. This result appears to be inconsistent with the contention that borrowers with higher networth are less likely to be rationed.

## CHAPTER VII

### ARE THERE ECONOMIES OF SCALE AQUACULTURE?

This chapter presents the empirical results of the Cobb-Douglas production function for the aquaculture sector. The production function is used to determine the presence of scale economies in aquaculture.

#### The Cobb- Douglas Production Function

The statistical formulation of the equation is:

$$\begin{aligned}\ln Y = & \ln A + b_1 \ln \text{Land} + b_2 \ln \text{Labor} + b_3 \ln \text{Fingerlings} \\ & + b_4 \ln \text{Feeds} + b_5 \ln \text{Fertilizer} + b_6 \ln \text{Pesticide} \\ & + b_7 \ln \text{Lime} + \text{error term}\end{aligned}$$

The variables are defined as follows:

#### Y (OUTPUT)

Output is measured in terms of yield, gross revenue and total production of the fishpond for one cropping period. Total production in kilograms of milkfish or prawns yielded the best regression fit.

#### LAND

Land is defined as the total productive area from which milkfish or prawns was harvested for one cropping period for the year 1991. This variable is measured in hectares.

#### LABOR

Labor is measured in man-days. It reflects both family and hired labor used in pond preparation, feeding and fertilizing and harvesting.

#### FRY/FINGERLING

The number of fry/fingerlings indicates the stocking rate. The variable which is measured in number of pieces per hectare is also indicative of the level of technology (or culture method) adopted by the operator. The stocking rate for each culture method differs between milkfish and prawns. The BFAR classifies the culture method by the stocking rate:

Culture Method	Stocking Rate (pieces per hectare)	
	No. of Prawn Fingerlings	No. of Milkfish Fry
Traditional	< 10,000	< 1,000
Extensive	10,000-50,000	1,000-3,500
Semi-Intensive	50,000-200,000	> 3,500
Intensive	1 > 200,000	

### **FEEDS, FERTILIZERS, PESTICIDE, LIME**

These inputs are measured as the amount of money in pesos spent for the production of milkfish or prawns for one hectare and one cropping season. Feeds include both commercial and trash fish. Fertilizers include both inorganic and organic types. While all of the above inputs have been included in prawn production function estimation, feeds and lime were excluded in the milkfish production function since only a few milkfish operators use said inputs.

### **Empirical Results**

Empirical results of estimating Cobb-Douglas production function is given in Table 70. The regression models for both milkfish and prawn production functions are significant at the .01 level. The high  $R^2$  of both production function of more than 80 percent implies a good statistical fit.

The sum of elasticities in both milkfish and prawn culture signifies an increasing returns to scale. This implies that a more than proportional increase in output can be realized from an additional application of all inputs. Thus, there is still much room for the expansion of production capacities and output. Among the inputs that have a highly significant effect on production are the stocking rate and the size of fishpond area. For instance, a 1 percent increase in stocking rate will result in a 0.6 percent increase in prawn production and 0.7 percent increase in milkfish production. Similarly, a 1 percent increase in fishpond area will yield a 0.8 percent and 1 percent increase in milkfish and prawn production, respectively. These findings imply that diseconomies of scale tend to set in if inappropriate limits are placed on land areas or if the operators are constrained by shortage of capital to have an optimum stocking rate. For instance, Chong (1982) estimated that economies of scale in milkfish production can be obtained by increasing farm size up to 50 hectares. Diseconomies of scale occur with farms larger than 50 hectares. Based on the results of our estimation of the Cobb-Douglas production function, the efficient area for aquaculture production is 13 and 18 hectares for prawns and milkfish,

respectively. These land areas were obtained by equating the value of the marginal product (VMP) of land with the price of land including the development costs.

One may argue that a higher intensification level may offset the size limitation imposed by CARP. This means that the use of higher level technology may produce the desired yields despite the reduction in farm size. This may be difficult for prawn production considering the high capital investments incurred in pond development. Development costs alone for prawn production range from P350,000 per hectare for ponds using traditional culture to P1 million per hectare for those fishfarms using intensive culture. These values represent twice to five times the value of land in Region VI. A higher level of technology appears to be more beneficial for prawns than milkfish. It is observed that for milkfish production, optimal production can be achieved via extensive culture or a modified extensive culture (this has been cited by some of respondents who were interviewed).

Thus, the alternative strategy of resorting to higher intensification level may be feasible under the following conditions: First, financial capital is available. A higher stocking rate will require increase usage of supplemental food, more fertilization and improvements in the fishpond. Second, there is a sufficient supply of quality fries and fingerlings. Third, the carrying capacity of fishponds in the area would allow for an intensive culture. The carrying capacity is also affected by environmental factors. In the study of Auburn University (1992), it was noted that the carrying capacities of fishponds in Region VI have decrease because the drainage system have been affected by pollutants coming from factories and sugar centrals as well as the crowding of fishfarms in some areas. And fourth, empirical evidence that a more intensive culture is production efficient. This last condition may be true for prawns as earlier observed but the case for milkfish has not been established. Based on the earlier profitability analysis for milkfish production in Region VI, optimal production can already be achieved via extensive culture compared to a requirement for a semi-intensive culture for prawns. Traditional culture of milkfish in fact has been employed by prawn operators for following. No fertilization or feeding is done and the milkfish thrive primarily on the organic residue left from previous prawn culture. This practice proves to be effective as means a of cleaning the pond.

## CHAPTER VIII

### CONCLUSIONS AND POLICY IMPLICATIONS

This study was undertaken to determine the possible effects of CARP on the credit markets for the aquaculture sector, in particular, on the monoculture production of milkfish and prawn. We also examined economies of scale in aquaculture production.

Using data from a survey of banks and fishpond operators in Region VI, we hypothesized that: (1) Under agrarian reform banks tend to put a lower collateral value on fishponds; (2) With agrarian reform banks tend to become highly selective in the type of fishpond projects to finance; (3) Under agrarian reform banks would tend to credit ration fishpond operators which offer aquaculture lands as collateral; and (4) Agrarian reform will constrain aquaculture production which could further create constraints to the fishpond operator's access to bank credit.

The results of descriptive and statistical analyses have indicated that CARP has some adverse effects on the access to formal credit of the aquaculture sector. Specifically, CARP's impact on the aquaculture sector has been felt in two ways: first, on the collateral value of agricultural lands; and second, on the profitability of aquaculture operations. There are indications that aquaculture lands including privately-owned fishfarms have now been considered by banks as the undesirable collateral. Aquaculture loans recently approved by banks, in particular, the commercial and private development banks, are in most cases supported by real estate lands (e.g., residential, commercial). Although rural banks and Land Bank Field offices, which cater to the small aquaculture operators, accept aquaculture lands as collateral the loan value has been limited to 5 hectares. This behavior of banks may be insignificant to operators with other collaterals to offer but would be substantial for small operators with no other collaterals to offer.

Banks are observed to have adjusted their loan portfolios in response to the new uncertainties created by CARP. Fishpond operators are however, able to avail themselves of credit financing from input dealers. The main drawback is that informal credit can not seem to sustain the capital intensity of aquaculture production.

There is an apparent difference in the credit rationing behavior of banks towards aquaculture borrowers compared to other agricultural borrowers or non-agricultural borrowers. While there may have been more aquaculture borrowers rationed in the last two years, this results not solely from CARP but also from the industry's viability. Aquaculture production is considerably riskier than other agriculture production activities since it is subject not only to agricultural risks but also economic, political and social risks. For the prawn sector specifically, the currently low export price of prawns has dampened growth of the industry, cautioning banks to lessen their loan exposure to prawn production. While the milkfish industry is not subject to international price fluctuations, the industry's potential has been considered limited since the

local demand for milkfish is limited especially with the increasing demand for other fish species (e.g., Tilapia).

While demand conditions have temporal effects on the viability of the aquaculture industry, the effect of CARP tend to have far-reaching implications. Aquaculture operations require high investment costs and estimation results using the Cobb-Douglas production function showed an efficient area of 13 and 18 hectares for aquaculture production of prawn and milkfish, respectively.

These effects of CARP have important implications on the growth of the industry and the inability of the industry to be competitive. We submit that policy decisions such as CARP should be supported by a "compensation" package that would not alter production efficiencies in the sector. Size limitations can be offset by a higher level of intensification but this is a function of the following: (1) better access and availability of financing; (2) reasonable rates of interest; (3) sufficient supply of fries and fingerlings; and (4) environmental constraints that may affect the carrying capacity of fishponds. Alternatively, the possibility of encouraging contiguous agrarian reform areas to exploit economies of scale in production must be explored. For this to happen, public policy must address the appropriate incentive mechanisms and organizational structure.

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Table 1  
FISHERIES PRODUCTION BY SECTOR, PHILIPPINES, 1981 – 1991  
(In thousand metric tons)

Year	Total Quantity	% to Total	Aquaculture		Municipal		Commercial	
			Quantity	% to Total	Quantity	% to Total	Quantity	% to Total
1981	1773	100	340	19.18	939	52.96	495	27.92
1982	1897	100	392	20.66	978	51.56	526	27.73
1983	2110	100	445	21.09	1146	54.31	519	24.60
1984	2080	100	478	22.98	1089	52.36	513	24.66
1985	2052	100	495	24.12	1045	50.93	512	24.95
1986	2089	100	471	22.55	1072	51.32	546	26.14
1987	2213	100	561	25.35	1061	47.94	591	26.71
1988	2270	100	600	26.43	1070	47.14	600	26.43
1989	2371	100	629	26.53	1105	46.60	637	26.87
1990	2503	100	671	26.81	1132	45.23	700	27.97
1991	2599	100	692	26.63	1147	44.13	760	29.24
Total	23957	100	5774	24.10	11784	49.19	6399	26.71
Average	2177.91	100.00	524.91	23.85	1071.27	49.50	581.73	26.66
Comp. Ave. Growth Rate	3.90		7.36	3.34	2.02	(1.81)	4.38	0.46

Source: Selected Fishery Statistics 1982 – 1991, BAS  
1981 Fishery Statistics

Table 2  
BRACKISHWATER FISHPONDS IN OPERATION  
PHILIPPINES, 1980–1990  
(in Has.)

YEAR	Total Hectarage of Brackishwater Fishponds in Operation
1980	176,230.55
1981	195,831.89
1982	195,831.89
1983	196,269.16
1984	206,525.35
1985	205,000.51
1986	210,319.10
1987	210,457.71
1988	210,680.81
1989	215,421.13
1990	222,907.00
AVERAGE	204,134.10
COMP. AVE. GROWTH RATE	2.38

Source: Fisheries Statistics of the Philippines, BFAR

**Table 3**  
**AQUACULTURE PRODUCTION BY SELECTED SPECIES, PHILIPPINES, 1981–1991**  
(In thousand metric tons)

Year	Aquaculture							
	Milkfish		Prawn		Others <sup>a/</sup>		Total	
	Quantity	% to Total	Quantity	% to Total	Quantity	% to Total	Quantity	% to Total Fishery Prod'n
1981	225	66.18	2	0.59	113	33.24	340	19.18
1982	240	61.22	2	0.51	150	38.27	392	20.66
1983	239	53.71	9	2.02	197	44.27	445	21.09
1984	238	49.79	26	5.44	214	44.77	478	22.98
1985	194	39.19	27	5.45	274	55.35	495	24.12
1986	180	38.22	28	5.94	263	55.84	471	22.55
1987	198	35.29	32	5.70	331	59.00	561	25.35
1988	188	31.33	42	7.00	370	61.67	600	26.43
1989	193	30.68	44	7.00	392	62.32	629	26.53
1990	211	31.45	48	7.15	412	61.40	671	26.81
1991	234	33.82	47	6.79	411	59.39	692	26.63
Total	2340	40.53	307	5.32	3127	54.16	5774	24.10
Average	212.73	42.81	27.91	4.87	284.27	52.32	524.91	23.85
Comp. Ave. Annual Growth Rate	0.39	(6.49)	37.12	27.72	13.78	5.98	7.36	3.34

<sup>a/</sup>

e.g. Tilapia, Lapu–lapu, Carpa, Apahap

Source: Selected Fishery Statistics 1982–1991, BAS  
1981 Fishery Statistics

Table 4  
MILKFISH AND PRAWN PRODUCTION BY SECTOR, PHILIPPINES, 1981-1991  
(In thousand metric tons)

	M I L K F I S H								P R A W N							
	Commercial		Municipal		Aquaculture		TOTAL	% Share to fish Prod'n	Commercial		Municipal		Aquaculture		TOTAL	% Share to Prod'n
	Qty	% Share	Qty	% Share	Qty	% Share			Qty	% Share	Qty	% Share	Qty	% Share		
1981	0.00	0.00	11.30	4.78	225.03	95.22	236.33	100.00	0.08	3.70	0.38	17.59	1.70	78.70	2.18	100.00
1982	0.00	0.00	12.41	4.92	239.74	95.08	252.15	100.00	0.21	7.00	0.98	32.67	1.81	60.33	3.00	100.00
1983	0.00	0.00	6.70	2.73	238.56	97.27	245.26	100.00	0.33	3.07	1.14	10.59	9.29	86.34	10.76	100.00
1984	0.00	0.00	3.84	1.51	237.68	98.49	241.32	100.00	0.40	1.46	0.67	2.44	26.36	96.10	27.43	100.00
1985	0.05	0.03	1.87	0.96	193.65	99.02	195.57	100.00	0.22	0.80	0.84	3.04	26.54	96.16	27.60	100.00
1986	0.00	0.00	5.41	2.93	179.50	97.07	184.91	100.00	0.13	0.44	1.24	4.22	27.98	95.33	29.35	100.00
1987	0.00	0.00	1.72	0.86	197.53	99.14	199.25	100.00	1.22	3.51	1.15	3.31	32.38	93.18	34.75	100.00
1988	0.00	0.00	4.10	2.14	187.88	97.86	191.98	100.00	2.82	6.20	1.13	2.48	41.55	91.32	45.50	100.00
1989	0.06	0.03	2.75	1.41	192.90	98.56	195.71	100.00	2.08	4.38	1.48	3.14	43.54	92.48	47.08	100.00
1990	0.01	0.00	2.87	1.34	210.88	98.65	213.76	100.00	0.41	0.83	1.43	2.89	47.59	96.28	49.43	100.00
1991	0.06	0.03	2.95	1.24	234.12	98.73	237.13	100.00	0.07	0.15	1.46	3.09	45.74	96.76	47.27	100.00
Total	0.18	0.01	55.72	2.33	2337.47	97.66	2393.37	100.00	7.95	2.45	11.90	3.67	304.48	93.88	324.33	100.00
Average	0.02	0.01	5.07	2.26	212.50	97.74	217.58		0.72	2.87	1.08	7.77	27.68	89.36	29.48	1.29
Comp. Ave. Annual Growth Rate	3.09	(0.17)	(12.57)	(12.60)	0.40	0.36	0.03	(3.72)	(1.33)	(27.53)	14.41	(15.97)	38.99	2.09	36.15	31.04

Source: Selected Fishery Statistics, 1982-1991, Bureau of Agricultural Statistics (BAS)  
1981 Fishery Statistics, BAS

Table 5  
QUANTITY OF MILKFISH PRODUCTION IN BRACKISHWATER FISHPONDS BY REGION  
PHILIPPINES, 1981-1991

REGION	(1981)		(1982)		(1983)		(1984)		(1985)		(1986)		(1987)		(1988)		(1989)		(1990)		(1991)		AVERAGE		COMP. AVE. GROWTH RATE	
	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY %		QTY %	
																							QTY	% SHARE	QTY	% SHARE
Metro Manila	670	0.40	676	0.37	674	0.43	620	0.40	620	0.40	629	0.40	621	0.35	555	0.32	503	0.28	504	0.28	506	0.24	598	0.35	(2.71)	(4.98)
Ilocos	15,522	9.20	16,131	9.03	16,211	10.39	14,878	9.43	15,187	9.78	15,000	10.02	17,032	9.47	16,744	9.52	18,995	9.58	17,804	9.28	23,561	11.03	16,889	9.88	4.28	1.83
Cagayan Valley	527	0.31	548	0.31	116	0.07	304	0.20	492	0.32	658	0.42	703	0.39	691	0.39	680	0.38	754	0.39	904	0.42	560	0.33	5.54	3.08
Central Luzon	50,754	30.08	56,048	31.37	49,452	31.70	43,222	27.76	46,420	29.88	44,051	27.77	51,633	28.72	48,118	27.35	49,477	27.31	52,759	27.50	47,398	22.18	49,030	28.33	(0.68)	(3.00)
Southern Tagalog	18,367	10.89	18,387	10.28	16,594	10.64	8,567	5.50	11,177	7.19	10,159	6.40	10,167	5.65	8,312	5.29	8,082	5.00	9,509	4.88	11,945	5.59	12,111	7.04	(4.21)	(6.45)
Bicol	3,078	3.01	8,087	3.41	5,527	3.54	5,500	3.53	5,522	3.55	8,352	4.00	8,357	3.54	3,971	2.28	3,861	2.18	4,187	2.17	4,388	2.05	5,175	3.02	(1.45)	(3.75)
Western Visayas	50,812	30.00	52,375	29.31	43,853	28.11	56,302	36.16	50,132	32.27	54,028	34.06	62,723	34.89	63,298	35.98	64,959	35.85	68,022	35.45	82,104	38.42	58,948	33.88	4.98	2.51
Eastern Visayas	4,085	2.42	4,362	2.44	3,649	2.34	3,441	2.21	4,436	2.86	6,565	4.14	6,565	3.65	8,368	3.83	8,771	3.74	8,897	3.59	8,123	3.80	5,571	3.17	7.12	4.62
Central Visayas	3,818	2.28	4,656	2.81	2,512	1.81	2,218	1.42	2,428	1.56	2,124	1.34	2,135	1.19	2,263	1.29	2,349	1.30	2,512	1.31	2,678	1.25	2,689	1.56	(3.48)	(5.73)
Western Mindanao	8,351	4.95	8,351	4.87	7,013	4.50	9,883	6.22	7,887	5.06	7,923	4.89	10,300	5.73	12,747	7.25	14,254	7.87	16,840	8.36	17,104	8.00	10,878	6.15	7.43	4.93
Northern Mindanao	2,383	1.41	2,363	1.33	1,588	1.01	2,948	1.89	2,274	1.46	2,104	1.35	2,859	1.48	2,764	1.58	2,910	1.81	3,103	1.82	3,445	1.81	2,598	1.48	3.75	1.33
Southern Mindanao	4,262	2.53	4,262	2.39	5,343	3.43	4,851	3.12	5,376	3.46	4,922	3.10	5,728	3.18	5,835	3.32	6,012	3.32	6,412	3.34	7,782	3.84	5,528	3.17	6.21	3.73
Central Mindanao	4,297	2.55	4,429	2.48	3,483	2.23	3,377	2.17	3,401	2.18	3,205	2.02	3,170	1.78	3,230	1.84	3,264	1.80	3,385	1.77	3,732	1.75	3,344	2.05	(1.40)	(3.70)
PHILIPPINES	168,727	100.00	178,879	100.00	155,995	100.00	153,708	100.00	155,344	100.00	158,821	100.00	179,791	100.00	175,935	100.00	181,187	100.00	191,878	100.00	213,874	100.00	174,141	100.00	2.38	

Source: Selected Fishery Statistics, Bureau of Agricultural Statistics, DA, 1991

Table 6  
QUANTITY OF PRAWN PRODUCTION IN BRACKISHWATER FISHPONDS BY REGION  
PHILIPPINES, 1981-1991

REGION	(1981)		(1982)		(1983)		(1984)		(1985)		(1986)		(1987)		(1988)		(1989)		(1990)		(1991)		AVERAGE		COMP. AVE. GROWTH RATE	
	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE	QTY	% SHARE
Metro Manila	7	0.41	7	0.39	-	0.00	-	0.00	-	0.00	-	0.00	-	0.00	64	0.15	58	0.13	58	0.12	57	0.12	42	0.22	23.33	(11.24)
Ilocos	157	9.21	163	9.04	380	4.09	1,545	5.88	2,060	7.78	2,175	7.77	2,330	7.20	3,585	8.63	3,785	8.65	4,189	8.80	4,556	9.96	2,264	7.91	40.05	0.78
Cagayan Valley	5	0.29	5	0.28	-	0.00	-	0.00	3	0.01	4	0.01	8	0.02	12	0.03	19	0.04	21	0.04	35	0.08	12	0.09	21.48	(12.58)
Central Luzon	513	30.11	566	31.39	574	6.18	12,420	47.12	12,459	46.95	12,770	45.64	8,202	25.33	10,673	25.69	12,058	27.69	12,857	27.02	11,045	24.15	8,558	30.66	35.93	(2.18)
Southern Tagalog	188	10.92	186	10.32	417	4.49	6,425	24.38	6,613	24.92	5,880	21.02	5,880	18.16	7,652	18.42	8,035	18.45	8,431	17.72	8,658	18.93	5,306	17.06	46.82	5.66
Bicol	51	2.99	62	3.44	66	0.71	193	0.73	216	0.81	343	1.23	336	1.04	800	1.93	1,276	2.93	1,347	2.83	1,433	3.13	557	1.98	39.59	0.46
Western Visayas	511	29.99	529	29.34	7,216	77.70	4,952	18.79	4,319	16.28	5,842	20.88	14,358	44.34	16,669	40.12	15,699	36.06	16,435	34.53	14,876	32.52	9,219	34.60	40.09	0.81
Eastern Visayas	39	2.29	47	2.61	234	2.52	340	1.29	374	1.41	327	1.17	324	1.00	384	0.92	450	1.03	479	1.01	499	1.09	318	1.49	29.03	(7.14)
Central Visayas	41	2.41	44	2.44	5	0.05	22	0.08	33	0.12	156	0.56	156	0.48	263	0.63	371	0.85	458	0.96	783	1.71	212	0.94	34.31	(3.35)
Western Mindanao	84	4.93	84	4.68	5	0.05	28	0.10	45	0.17	50	0.18	65	0.20	202	0.49	368	0.85	1,763	3.70	1,935	4.23	421	1.78	36.85	(1.52)
Northern Mindanao	24	1.41	24	1.33	51	0.55	108	0.41	79	0.30	70	0.25	76	0.23	110	0.26	156	0.36	200	0.42	237	0.52	103	0.55	25.73	(9.52)
Southern Mindanao	43	2.52	43	2.38	-	0.00	6	0.02	21	0.08	20	0.07	309	0.95	544	1.31	603	1.38	642	1.35	782	1.71	301	1.18	33.65	(3.82)
Central Mindanao	43	2.52	43	2.38	339	3.65	320	1.21	315	1.19	343	1.23	336	1.04	590	1.42	683	1.57	711	1.49	844	1.85	415	1.78	34.68	(3.08)
PHILIPPINES	1,704	100.00	1,803	100.00	9,287	100.00	28,357	100.00	26,537	100.00	27,980	100.00	32,380	100.00	41,548	100.00	43,539	100.00	47,591	100.00	45,740	100.00	27,679	100.00	38.96	

Source: Selected Fishery Statistics, Bureau of Agricultural Statistics, DA, 1991

Table 7  
WORLD CATCH OF SHRIMPS AND PRAWNS  
BY MAJOR PRODUCING COUNTRIES, 1985-1988

	1985	% TO WORLD TOTAL	1986	% TO WORLD TOTAL	1987	% TO WORLD TOTAL	1988	% TO WORLD TOTAL	AVERAGE		COMP. AVE. GROWTH RATE	
	QTY (000 MT)		QTY (000 MT)		QTY (000 MT)		QTY (000 MT)		QTY	% SHARE	QTY	% SHARE
WORLD CATCH												
China	367	17.31	427	19.23	457	19.53	584	23.84	458.75	19.98	16.75	11.25
India	232	10.94	215	9.68	197	8.42	237	9.67	220.25	9.68	0.71	(4.03)
Indonesia	144	6.79	157	7.07	187	7.99	202	8.24	172.50	7.53	11.94	6.67
USA	153	7.22	138	6.22	165	7.05	151	6.16	151.75	6.66	(0.44)	(5.13)
Thailand	126	5.94	139	6.26	150	6.41	150	6.12	141.25	6.18	5.98	0.99
Taiwan	108	5.09	137	6.17	176	7.52	111	4.53	133.00	5.83	0.92	(3.83)
Ecuador	36	1.70	53	2.39	79	3.38	81	3.31	62.25	2.69	31.04	24.87
Philippines	62	2.92	72	3.24	68	2.91	80	3.27	70.50	3.08	8.87	3.74
Mexico	75	3.54	73	3.29	84	3.59	73	2.98	76.25	3.35	(0.90)	(5.56)
Malaysia	69	3.25	73	3.29	73	3.12	73	2.98	72.00	3.16	1.90	(2.90)
World Total	2120	100.00	2220	100.00	2340	100.00	2450	100.00	2282.50	100.00	4.94	

Sources: Yearbook of Fishery Statistics, FAO  
This includes captures from marine and inland water.

Table 8  
MAJOR SHRIMP, PRAWN AQUACULTURE PRODUCERS  
1986-1989

COUNTRY	1986		1987		1988		1989		AVERAGE		COMP. AVE. GROWTH RATE	
	QTY (tonnes)	% SHARE	QTY (tonnes)	% SHARE	QTY (tonnes)	% SHARE	QTY (tonnes)	% SHARE	QTY (tonnes)	% SHARE	QTY (tonnes)	% SHARE
China	82,827	25.60	153,272	30.11	199,418	34.89	175,000	32.57	152,629.25	30.79	28.32	8.36
Ecuador	30,683	9.48	72,953	14.33	74,480	13.03	72,000	13.40	62,529.00	12.56	32.89	12.22
Indonesia	40,888	12.64	55,967	10.99	67,470	11.80	67,470	12.56	57,948.75	12.00	18.17	(0.21)
Taiwan (Prov. of China)	49,618	15.33	88,264	17.34	39,507	6.91	24,022	4.47	50,352.75	11.01	(21.48)	(33.69)
Philippines	31,081	9.61	35,740	7.02	44,867	7.85	47,861	8.91	39,887.25	8.35	15.48	(2.48)
Thailand	17,886	5.53	23,890	4.69	55,633	9.73	60,359	11.23	39,442.00	7.80	49.99	26.67
Vietnam	17,800	5.50	20,000	3.93	22,000	3.85	22,000	4.09	20,450.00	4.34	7.32	(9.37)
Bangladesh	14,658	4.53	14,773	2.90	16,577	2.90	18,235	3.39	16,060.75	3.43	7.55	(9.17)
India	14,000	4.33	15,000	2.95	17,000	2.97	17,000	3.16	15,750.00	3.35	6.69	(9.90)
a/												
Others	24,132	7.46	29,219	5.74	34,593	6.05	33,299	6.20	30,310.75	6.36	11.33	(5.98)
TOTAL	323,573	100.00	509,078	100.00	571,545	100.00	537,246	100.00	485,360.50	100.00	18.41	

a/

e.g. Korea (Democratic People's Republic), Panama, Japan, Colombia, Peru

Source: FAO



Table 9  
WORLD EXPORTS OF SHRIMPS AND PRAWNS  
BY MAJOR EXPORTING COUNTRIES, 1980-1989

COUNTRY	1980		1981		1982		1983		1984		1985		1986		1987		1988		1989		AVERAGE		COMP. AVE. GROWTH RATE	
	QTY (MT)	% TO WORLD TOTAL	QTY (MT)	% TO WORLD TOTAL	QTY (MT)	% TO WORLD TOTAL	QTY (MT)	% TO WORLD TOTAL	QTY (MT)	% TO WORLD TOTAL	QTY (MT)	% TO WORLD TOTAL	QTY (MT)	% TO WORLD TOTAL	QTY (MT)	% TO WORLD TOTAL	QTY (MT)	% TO WORLD TOTAL	QTY (MT)	% TO WORLD TOTAL	QTY (MT)	% SHARE	QTY (MT)	% SHARE
China	21715	5.98	24007	6.68	14895	3.84	10695	2.49	16891	3.65	21965	4.30	49341	7.88	72988	9.89	128428	15.74	120118	14.24	48104.30	7.47	20.93	10.12
Thailand	17915	4.93	18761	5.22	22647	5.84	20150	4.70	19428	4.19	24041	4.71	28717	4.59	53911	7.30	42641	5.25	68510	8.12	31692.10	5.49	18.07	5.69
Indonesia	30471	8.39	23804	6.57	24583	6.34	24241	5.65	26171	5.65	27798	5.44	33931	5.42	40794	5.53	53002	6.49	67568	8.01	35216.30	6.35	9.25	(0.52)
India	47762	13.16	54539	15.19	54825	14.09	53606	12.50	55200	11.92	49545	9.70	52152	8.33	51643	7.00	56835	6.96	57846	6.86	53375.30	10.57	2.15	(8.96)
Hong Kong	13877	3.82	13526	3.77	15193	3.92	15595	3.64	15817	3.41	19574	3.83	31428	5.02	36201	4.90	55120	6.75	50799	6.02	26713.00	4.51	15.51	5.18
Ecuador	9725	2.68	12133	3.38	16966	4.38	23535	5.49	19073	4.12	20172	3.95	30683	4.90	48912	6.63	49746	6.10	47050	5.58	27799.50	4.72	19.14	8.49
Denmark	19316	5.32	19392	5.40	20771	5.36	25382	5.92	26143	5.64	33734	6.61	38311	6.12	44375	6.01	40178	4.92	45288	5.37	31286.80	5.67	9.93	0.10
Viet Nam	-	-	-	-	-	-	8495	1.98	11647	2.51	16158	3.16	19062	3.05	21861	2.96	30507	3.74	34200	4.05	14193.00	2.15	26.13	12.67
Greenland	13769	3.79	18650	5.19	14754	3.81	18108	4.22	19750	4.26	27038	5.30	33133	5.29	33492	4.54	29821	3.65	29554	3.50	23806.90	4.36	8.86	(0.88)
Philippines	2569	0.71	2716	0.76	3938	1.02	4743	1.11	6438	1.39	8105	1.59	11211	1.79	14935	2.02	23536	2.88	26052	3.09	10424.30	1.63	29.36	17.79
World Total	363045	100.00	359158	100.00	387815	100.00	428724	100.00	463270	100.00	510631	100.00	625930	100.00	738258	100.00	816127	100.00	843496	100.00	553625.20	100.00	9.82	

Source: 1989 Yearbook of Fishery Statistics, FAO

Table 10 <sup>a/</sup>  
EXPORT VALUE (\$/MT) OF SHRIMPS AND PRAWNS BY COUNTRY

COUNTRY	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	AVERAGE
China	8.30	8.23	9.26	9.03	7.54	6.79	7.13	6.95	6.59	6.10	7.59
Thailand	5.35	5.23	5.31	6.83	6.11	5.27	5.82	4.14	8.07	8.78	6.09
Indonesia	5.84	6.63	7.22	7.65	7.29	6.96	8.26	8.39	9.16	7.63	7.50
India	4.88	5.28	5.83	5.74	5.24	5.14	5.78	5.99	5.96	4.95	5.48
Hong Kong	6.84	6.94	8.34	8.04	7.55	6.86	7.33	6.93	7.11	5.98	7.19
Ecuador	7.38	6.91	7.65	7.89	7.69	7.88	9.28	7.89	6.86	7.14	7.66
Denmark	2.98	3.30	2.68	2.93	2.73	2.73	3.81	4.96	5.40	4.89	3.64
Viet Nam	—	—	—	3.92	4.17	3.65	3.74	5.13	4.68	4.39	2.97
Greenland	2.24	2.52	2.36	2.87	2.53	2.75	3.33	4.84	5.41	5.47	3.43
Philippines	8.05	8.38	8.31	7.61	5.41	7.71	9.26	10.35	10.60	8.88	8.46

a/

These were derived from the quantity and value of frozen shrimps and prawns exports of each country.

Source: 1989 Yearbook of Fishery Statistics, FAO

Table 11  
COST AND RETURNS OF PHILIPPINE PRAWN PRODUCTION  
BY CULTURE METHOD, (P/Ha./Cropping)

	EXTENSIVE	SEMI INTENSIVE	INTENSIVE
o ASSUMPTIONS			
Stocking/ha. (pcs)	50,000	150,000	200,000
Survival rate (%)	70	70	70
Ave. size @ harvest (g)	35	33	30
Feed Conversion Ratio	1.5:1	1.6:1	1.7:1
Total Harvest (MT)	1.225	3.465	4.200
Ave. Price per kilo (P)	150.00	150.00	150.00
o SALES			
	183,750.00	519,750.00	630,000.00
1. Fry @ P 0.11/pc	5,500.00	16,500.00	22,000.00
2. Lime/Teaseed cake/etc.	5,000.00	144,144.00	185,640.00
3. Feeds @ P 26.00/kg	47,775.00	6,000.00	6,000.00
4. Labor	6,000.00	34,650.00	176,250.00
5. Power	6,125.00	5,000.00	5,000.00
o TOTAL OPERATING COST			
	70,400.00	206,294.00	394,890.00
o PROFIT			
	113,350.00	313,456.00	235,110.00
o UNIT COST (P/MT)			
	57,469.39	59,536.51	94,021.43
o UNIT COST (\$/MT)			
	2,636.21	2,731.03	4,312.91 <sup>a/</sup>

a\_  
Based on 1989 exchange rates.

Source: Bureau of Fisheries and Aquatic Resources  
Accelerated Agricultural Production Project  
Market Development Sub-Project, DA 1990

Table 12  
EXPORTS OF MILKFISH BY KIND, COUNTRY OF DESTINATION,  
AND QUANTITY, PHILIPPINES, 1990-1991

ITEM	1991		1990		PERCENT
	QTY (KG)	% SHARE	QTY (KG)	% SHARE	CHANGE (%)
o Milkfish (Bangus)					
1. Prepared or Preserved in airtight containers	45,419	100.00	59,214	100.00	(23.30)
USA	32,009	70.47	37,105	62.66	(13.73)
Hawaii	5,963	13.13	13,930	23.52	(57.19)
Australia	3,884	8.55	808	1.36	380.69
Trust Territory of the Pacific Islands	794	1.75	48	0.08	1,554.17
Canada	699	1.54	634	1.07	10.25
Other Countries	2,070	4.56	6,689	11.30	(69.05)
2. Frozen (except fillets)	271,925	100.00	805,177	100.00	(66.23)
USA	146,539	53.89	563,267	69.96	(73.98)
Trust Territory of the Pacific Islands	26,745	9.84	18,192	2.26	47.02
Canada	24,239	8.91	36,167	4.49	(32.98)
Hawaii	23,335	8.58	46,584	5.79	(49.91)
Japan	20,687	7.61	1,700	0.21	1,116.88
Other Countries	30,380	11.17	139,267	17.30	(78.19)
3. Fillets	-	-	1,052		-
USA	-	-	1,052	100.00	-
4. Smoked	12,004	100.00	3,327	100.00	260.81
Guam	6,385	53.19	816	24.53	682.48
USA	4,720	39.32	696	20.92	578.16
Hawaii	445	3.71	1,633	49.08	(72.75)
Trust Territory of the Pacific Islands	363	3.02	-	0.00	
Australia	91	0.76	168	5.05	(45.83)
Others	-	-	14	0.42	
o Total Milkfish Export	329,348		867,718		(62.04)

Source: 1991 Fishery Statistics, Bureau of Agricultural Statistics, DA

**Table 13**  
**COST AND RETURNS OF PHILIPPINE MILKFISH PRODUCTION**  
**(P/Ha./Cropping)**

I T E M	QUANTITY	PRICE/UNIT (P/UNIT)	TOTAL (PESOS)
o ASSUMPTION: POND ADOPTS MODIFIED EXTENSIVE METHOD			
o SALES	3,000 PCS	13.00 /PC	39,000.00
	1,000 KG	39.00 /KG	39,000.00
1. Fry	3,000 PCS	3.00 /PC	9,000.00
2. Lime	500 KG	3.00 /KG	1,500.00
3. Pesticide:			
Gusathion	75 ML	300.00 /BTL	300.00
4. Fertilizer:			
Organic:			
Chicken Manure	6 BAGS	150.00 /BAG	900.00
Inorganic:			
(16-20-0)	3.33	385.00	1,282.05
5. Supplementary Feed:			a_ /
Bread	15 SACKS	80.00 /SACK	1,200.00
6. Labor			5,000.00
o TOTAL OPERATING COST			19,182.05
o PROFIT			19,817.95
o UNIT COST (P/MT)			19,182.05
o UNIT COST (\$/MT)			b_ / 673.05

a\_ /

Cost for lime and supplementary feeds are optional depending on fishpond location.

b\_ /

Based on 1991 rates.

Source: Marketing Service Division, Department of Agriculture, 1991

**Table 14 a/  
EXTENT OF BORROWING OF FISHPOND OPERATORS  
(in Percent)**

	1977	b_/ 1990			
		Region 1	Region 3	Region 6	Averaged for All Regions
o Borrowing	91	11	23	14	14
o Self-financed	9	81	68	68	70
o Both					
o No Response		8	9	18	16
<b>For Self-financed :</b>					
o Self-financed but would borrow if credit is made available		67	74	64	65
o Self financed and with no intention of borrowing		31	26	21	22
o No Response		2		15	13

a\_/ Includes brackishwater fishponds only.

b\_/ Based on the last five years of operation.

Sources: Cruz and Lizarondo, Fishpond Operators and Marketing Practices in Quezon Province, 1977  
Aquaculture Division, Bureau of Fisheries and Aquatic Resources,  
Report on the Assessment of Fishponds under Fishpond Lease Agreement, November 1991

Table 15  
AGRICULTURAL PRODUCTION LOANS GRANTED, BY COMMODITY, 1980-1991  
(P Million at Constant Prices of 1972)

	1980		1981		1982		1983		1984		1985		1986		1987		1988		1989		1990		1991		Average Amount	Average Share	Compoundd Ave. Annual Growth Rate (%)
	Amount	% Share	Amount	% Share	Amount	% Share	Amount	% Share	Amount	% Share	Amount	% Share	Amount	% Share	Amount	% Share	Amount	% Share	Amount	% Share	Amount	% Share	Amount	% Share			
CROPS	6,720.4	77.18	7,083.4	74.25	8,471.7	71.88	8,078.8	70.87	8,870.4	73.53	9,384.2	81.20	9,747.2	80.53	9,856.1	80.84	9,068.0	70.13	2,776.8	68.32	2,923.0	82.43	3,008.5	62.73	4,387.4	72.85	(7.0)
Rice	714.0	8.20	648.9	6.80	810.1	6.78	800.1	7.00	212.8	4.04	195.1	4.71	324.7	6.98	400.1	8.85	521.9	11.94	518.7	12.71	635.8	14.00	809.5	18.97	325.8	8.25	2.2
Corn	81.0	0.70	75.1	0.79	83.6	0.89	66.7	0.78	33.9	0.84	29.0	0.70	43.0	0.92	88.5	1.96	78.0	1.78	81.8	2.01	69.4	1.48	135.0	2.81	70.4	1.29	7.5
Coconut	562.3	8.48	1,324.8	13.89	985.6	10.72	494.2	5.78	136.4	2.59	821.2	18.82	733.5	15.78	641.9	14.19	627.5	14.35	207.8	5.11	398.8	8.51	331.1	6.91	603.7	10.34	(4.7)
Sugarcane	3,726.7	42.80	2,740.0	28.72	3,407.5	37.84	2,827.7	32.97	1,317.2	28.82	1,246.5	30.09	1,012.9	21.77	958.8	21.20	924.5	21.15	844.8	23.24	787.3	18.38	685.4	14.29	1,728.9	28.61	(14.3)
Other Crops	1,656.3	18.02	2,294.8	24.06	1,404.9	15.60	2,000.1	24.37	1,970.0	37.42	1,072.4	25.66	1,633.1	35.09	1,568.7	34.64	914.1	20.91	1,025.8	23.24	1,034.0	22.07	847.5	19.76	1,487.5	25.34	(5.0)
LIVESTOCK & POULTRY	1,304.8	14.89	1,500.9	15.73	1,673.5	18.59	1,805.3	18.72	887.8	18.86	457.8	11.05	443.4	9.53	450.5	9.96	623.4	14.26	732.2	18.81	1,078.0	23.81	1,111.6	23.18	988.1	18.18	(1.4)
FISHERIES	350.2	4.02	492.5	5.18	524.5	5.82	629.2	7.34	308.8	5.89	208.4	5.03	352.3	7.57	344.8	7.62	594.4	13.59	478.2	11.77	596.0	12.72	577.7	12.05	454.8	8.22	4.7
FORESTRY	350.7	3.80	462.7	4.85	334.3	3.71	263.7	3.07	198.0	3.72	112.8	2.72	110.4	2.37	71.3	1.58	88.3	2.02	77.5	1.91	86.0	1.84	97.8	2.04	185.9	2.80	(10.5)
GRAND TOTAL	8,706.2	100.0	9,539.5	100.0	9,004.0	100.0	8,576.9	100.0	9,284.1	100.0	4,143.0	100.0	4,853.4	100.0	4,522.5	100.0	4,372.0	100.0	4,064.8	100.0	4,585.0	100.00	4,795.8	100.00	6,027.2	100.00	(5.3)

m/ constant prices obtained from using implicit price index for agriculture

Source: ACPC Year End Credit Report  
NEDA Statistical Yearbook, 1990

Table 16  
LOANS GRANTED TO FISHERIES  
BY INSTITUTION, 1986-1991  
(Amount in Million Pesos at Constant Prices of 1972)

Institution	1986	% Share	1987	% Share	1988	% Share	1989	% Share	1990	% Share	1991	% Share	Average Share	Compounded Ave. Annual Growth Rate(%)
PNB	0.5	0.1	0.4	0.1	5.9	1.0	7.2	1.5	5.3	0.9	b/		0.7	81.9 c/
DBP	*		2.2	0.8	6.2	1.1	2.3	0.5	1.1	0.2	1.90	0.33	0.4	(4.0)
LBP	*		2.4	0.7	7.9	1.3	51.9	10.9	48.2	7.8	38.84	8.78	4.8	101.1
PKBs	304.6	88.5	273.8	79.5	512.4	86.2	357.7	74.8	488.6	82.0	469.13	81.90	81.8	9.0
SMBs	3.7	1.0	1.3	0.4	2.1	0.4	6.2	1.3	0.8	0.1	0.09	0.02	0.5	(51.9)
PDBs	13.9	3.9	30.7	8.9	27.7	4.7	23.1	4.8	22.6	3.8	21.76	3.80	5.0	9.4
RBs	29.7	8.4	33.8	9.8	32.0	5.4	29.9	6.2	31.4	5.3	41.05	7.17	7.1	6.7
SSLAs a/	*		*		*		*		*		*		*	*
TOTAL	352.3	100.0	344.6	100.0	594.4	100.0	478.2	100.0	598.0	100.0	572.8	100.0	100.1	10.2

\* - data not available

a/ - SSLA loans cannot be disaggregated.

b/ - included in PKB loans

c/ - covers the period 1986 to 1990

Source: ACPC, Credit Trends



**Table 17**  
**FEATURES OF MAJOR CREDIT PROGRAMS FOR THE AQUACULTURE SECTOR**

Program	Program Duration	Program Loan Fund	Source of Program Funds	Implementing Agency	Areas of Implementation	Lending Channels	Major Objective	Interest Rate (End-User)	Maturity
Aquaculture Development Project (ADP)	July 1984 – June 1989	\$14.09 million	ADB	Central Bank DA-BFAR	Aklan, Capiz, Iloilo	Accredited Financial Institutions	to finance development of aquaculture projects	14% per annum	working capital = 1 yr. pond improvement/ rehabilitation = 10 yrs.
Agricultural Loan Fund (ALF)	July 2, 1990 to present	\$118.9 million	IBRD USAID	Land Bank a/	Nationwide	Accredited Banks and Non-Banks	to provide credit for agricultural projects	variable based on WAIR b/	short term = 12–18 months long term not to exceed 15 years
Small and Medium Industry Loan Program (SMILP)	Jan. 1989 to present	P500 million	Social Security System (SSS)	Land Bank	Nationwide	LBP – Branches	to provide long-term credit to small and medium scale enter-prises	20% per annum	not specified
Livelihood Enhancement for Agricultural Development (LEAD) c/	May 1988 – May 1993	P ____	Foreign Grants	Department of Agriculture	Nationwide	UCPB, LBP	to provide assistance/credit to farmer's groups	Bank Assisted (variable)	not specified
Fisheries Sector Program (FSP)	1990 – 1994	P100 million	ADB	Department of Agriculture	Aquaculture – Regions 1, 3, 4, 5, 8, 9	Accredited Financial Institutions Land Bank	Aquaculture – to intensify production	12% (coops)	not specified
Agro-Industrial Technology Transfer Program (AITTP)	May 1983 – May 1989	P826 million	Overseas Economic Cooperation Fund (Japan)	Technology Livelihood and Resource Center (TLRC)	Nationwide	Direct lending by TLRC	to strengthen agricultural sector through technology transfer	Short term = 12% Long term = 13%	Short term = 1 year Medium and long term = based on project cashflow

a/ the ALF was previously managed by the Central Bank from 1985 to July 2, 1990.

b/ Weighted Average Interest Rate on time deposits of 61–90 days of 10 major commercial banks.

c/ composed of two-components – the Bank Assisted and Grant Assisted Components.

Source: Agricultural Credit Policy Council (ACPC). Profile of Agricultural Credit and Guarantee Programs

Table 18  
GFSME PRAWN FINANCING PROJECTS  
(In Million Pesos)

	CALF Supported Projects As of October 1991			GFSME - Regular Programs As of December 1991		
	No. of Borrowers	Loans Guaranteed	% Share	No. of Borrowers	Loans Guaranteed	% Share
<b>A. By Financial Institutions</b>	<b>20</b>	<b>24.830</b>	<b>100.0</b>	<b>64</b>	<b>120.181</b>	<b>100.0</b>
	=====	=====	=====	=====	=====	=====
- Commercial Banks (PKBs)	13	16.230	65.4	48	91.958	76.5
Far East Bank and Trust Company	12	15.730	63.4	10	12.410	10.3
Republic Planters Bank	1	0.500	2.0	8	14.184	11.8
Phil. Commercial International Bank	-	-	-	14	41.150	34.2
United Coconut Planters Bank	-	-	-	10	12.994	10.8
Asiatrust	-	-	-	3	5.620	4.7
Solidbank	-	-	-	3	5.600	4.7
- Private Development Banks (PDBs)	5	7.100	28.6	10	21.898	18.2
Planters Development Bank	3	4.300	17.3	3	5.100	4.2
BPI Agricultural Dev't. Bank	2	2.800	11.3	-	-	-
Luzon Development Bank	-	-	-	1	2.348	2.0
Peninsula Dev't. Bank	-	-	-	4	9.250	7.7
Agribusiness Dev't Bank	-	-	-	2	5.200	4.3
- Specialized Government Banks (SGBs)	1	1.000	4.0	-	-	-
Land Bank of the Philippines	1	1.000	4.0	-	-	-
- Rural Bank/Cooperative Rural Bank	1	0.500	2.0	1	0.200	0.2
CRB Lanao del Norte	1	0.500	2.0	-	-	-
RB of Oroquieta	-	-	-	1	0.200	0.2
- Non-Bank Lending Institutions	-	-	-	5	6.125	5.1
Private Dev't. Corp. of the Phil.	-	-	-	5	6.125	5.1

TABLE 18  
PAGE 2

	CALF Supported Projects As of October 1991			GFSME - Regular Programs As of December 1991		
	No. of Borrowers	Loans Guaranteed	% Share	No. of Borrowers	Loans Guaranteed	% Share
<b>B. By Region</b>	<b>20</b>	<b>24.830</b>	<b>100.0</b>	<b>64</b>	<b>120.181</b>	<b>100.0</b>
	=====	=====	=====	=====	=====	=====
NCR - National Capital Region	-	-	-	-	-	-
I - Ilocos	3	3.300	13.3	7	12.725	10.6
II - Cagayan Valley	-	-	-	-	-	-
III - Central Luzon	2	4.000	16.1	6	12.800	10.7
IV - Southern Tagalog	2	0.680	2.7	4	10.198	8.5
V - Bicol	-	-	-	-	-	-
VI - Western Visayas	11	15.350	61.8	45	81.758	68.0
VII - Central Visayas	-	-	-	-	-	-
VIII - Eastern Visayas	-	-	-	-	-	-
IX - Western Mindanao	-	-	-	-	-	-
X - Northern Mindanao	1	1.000	4.0	2	2.700	2.2
XI - Southern Mindanao	-	-	-	-	-	-
XII - Central Mindanao	1	0.500	2.0	-	-	-
<b>C. By Purpose</b>	<b>20</b>	<b>24.830</b>	<b>100.0</b>	<b>64</b>	<b>120.181</b>	<b>100.0</b>
	=====	=====	=====	=====	=====	=====
Working Capital		6.025	24.3		35.710	29.7
Fixed Assets		18.805	75.7		82.821	68.9
RC		-	-		1.650	1.4

Source: ACPC, Credit Report

Table 19  
**LOANS GRANTED TO AQUACULTURE UNDER  
 AGRICULTURAL GUARANTEE INSTITUTIONS**  
 (As of June 30, 1992)

	Loans Granted		Loans Outstanding (PM)
	No.	Amount (PM)	
CALF – Supported Guarantee Programs			
GFSME	1.701	39.543	13.897
PCIC	3.347	57.944	n.a.
QGFB	2	21.672	2.300
BPhB	2 (LGUs)	0.756	n.a.
GFSME–Regular	69	124.096	n.a.
Total	5.121	244.011	16.197

n.a. not available

Source: ACPC

Table 20  
**REPAYMENT PERFORMANCE AND DEFAULT  
 CONDITIONS OF LOANS GRANTED TO AQUACULTURE a/**  
**(As of December 1991)**

Program	Repayment Rate (%)	Past Due Ratio (%)
<b>A. Special Credit Funds</b>		
Aquaculture Development Project (ADP)	91	11
Agricultural Loan Fund (ALF)	100	0
SMILP	80	42
AITTP	62	29
LEAD (Grant-Assisted)	4.7 b/	
FSP	c/	c/
<b>B. Credit Guarantee Institutions</b>		
GFSME-CALF	99.4	1.1
PCIC-CALF	n.a	n.a
QGFB-CALF	89.4	100
GFSME-Regular	82.0	22.4

a/ Except for ADP, repayment and default status are based on loans to prawn projects.

b/ recovery rate

c/ no repayment data since loans have just been released in 1991

Source: ACPC

Table 21  
BRACKISHWATER FISHPONDS IN OPERATION  
BY REGION, 1986-1988

REGION	AVERAGE	% SHARE TO TOTAL
I	15243.79	7.59
II	1123.35	0.56
III	47751.78	23.78
NCR	817.39	0.41
IV	26518.06	13.21
V	11999.58	5.98
VI	50255.07	25.03
VII	6631.47	3.30
VIII	7342.31	3.66
IX-A	1155.95	0.58
IX-B	15886.79	7.91
X	4592.61	2.29
XI	7034.83	3.50
XII	4577.35	2.28
TOTAL	200801.89	100.00

**Table 22**  
**FREQUENCY AND PERCENTAGE DISTRIBUTION OF SAMPLE RESPONDENTS BY AREA,**  
**POND AUTHORIZATION, CULTURE SPECIE, AND SIZE OF FARM**  
**(N = 241)**

MILKFISH POND OWNERS						PRAWN POND OWNERS						
AREA (PROVINCE)/ POND AUTHORIZATION	WITH SMALL/MEDIUM- SIZED FARMS		WITH LARGE- SIZED FARMS		TOTAL	WITH SMALL/MEDIUM- SIZED FARMS		WITH LARGE- SIZED FARMS		TOTAL	ROW TOTAL	
	(n)	(% SHARE)	(n)	(% SHARE)		(n)	(% SHARE)	(n)	(% SHARE)			
ILOILO (TOTAL)	21	52.50	19	47.50	40	4	50.00	4	50.00	8	48	
FLA	9	64.29	5	35.71	14	3	50.00	3	50.00	6	20	
NON-FLA	12	46.15	14	53.85	26	1	50.00	1	50.00	2	28	
CAPIZ (TOTAL)	12	54.55	10	45.45	22	17	51.52	16	48.48	33	55	
FLA	0	0.00	2	100.00	2	9	64.29	5	35.71	14	16	
NON-FLA	12	60.00	8	40.00	20	8	42.11	11	57.89	19	39	
AKLAN (TOTAL)	14	48.28	15	51.72	29	12	75.00	4	25.00	16	45	
FLA	12	50.00	12	50.00	24	9	69.23	4	30.77	13	37	
NON-FLA	2	40.00	3	60.00	5	3	100.00	0	0.00	3	8	
NEGROS OCCIDENTAL (TOTAL)	18	60.00	12	40.00	30	41	65.08	22	34.92	63	93	
FLA	6	75.00	2	25.00	8	6	46.15	7	53.85	23	21	
NON-FLA	12	54.55	10	45.45	22	35	70.00	15	30.00	50	72	
COLUMN TOTAL	65		56		121	74		46		120	241	
	53.72%		46.28%		100.00%	61.16%		38.02%		100.00%		

**Table 23**  
**FREQUENCY DISTRIBUTION OF ACCOUNTS**  
**(SELECTED BANKS)**

NAME OF BANKS	AQUA- LOANS	AGRI- LOANS	TOTAL
<b>I. NEGROS OCCIDENTAL</b>			
1. BANK OF THE PHILIPPINE ISLANDS BACOLOD CITY	0	0	0
2. LAND BANK OF THE PHILIPPINES KABANGKALAN, N.O. (F.O.)	0	6	6
3. RURAL BANK OF ESCALANTE ESCALANTE, N.O.	5	1	6
4. SOUTHERN NEGROS DEV'T BANK BACOLOD CITY	30	28	58
5. PHILIPPINE COMMERCIAL INT'L BANK BACOLOD CITY	9	1	10
6. RIZAL COMMERCIAL BANKING CORP. BACOLOD CITY	10	10	20
<b>II. CAPIZ</b>			
1. DEVELOPMENT BANK OF THE PHILS. CAPIZ	18	13	31
2. RURAL BANK OF PANAY PANAY, CAPIZ	23	29	52
<b>III. AKLAN</b>			
1. TRADERS ROYAL BANK AKLAN	2	0	2
2. LAND BANK OF THE PHILIPPINES KALIBO, AKLAN (F.O.)	3	4	7
3. COOPERATIVE RURAL BANK OF AKLAN AKLAN	12	27	39
<b>IV. ILOILO</b>			
1. LAND BANK OF THE PHILIPPINES GUIMARAS, ILOILO (F.O.)	7	6	13
2. DEVELOPMENT BANK OF THE PHILS ILOILO CITY	17	15	32
3. UNITED COCONUT PLANTERS BANK ILOILO CITY	8	8	16
4. METROPOLITAN BANK ILOILO CITY	3	3	6
5. RURAL BANK OF DUMANGAS DUMANGAS	15	16	31
6. RIZAL COMMERCIAL BANKING CORP. ILOILO CITY	4	4	8
7. RURAL BANK OF SAN ENRIQUE ILOILO CITY	4	4	8
<b>T O T A L</b>	<b>170</b>	<b>175</b>	<b>345</b>



**Table 24**  
**DISTRIBUTION OF SAMPLE FISHPOND OPERATORS BY TYPE OF SPECIES**  
**CULTURED AND BY FISHPOND OWNERSHIP, 1991.**

	FLA		PRIVATELY-OWNED		ALL	
	No.	%	No.	%	No.	%
<b>SPECIES CULTURED</b>						
MILKFISH	47.00	50.54	74.00	50.34	121.00	50.42
PRAWNS	46.00	49.46	73.00	49.66	119.00	49.59
ALL	93.00	100.00	147.00	100.00	240.00	100.00

Table 25  
SIZE OF FISHPOND AREA OF SAMPLE  
FISHPOND OPERATORS

	FLA	PRIVATELY-OWNED				ALL
	MILKFISH	PRAWNS	MILKFISH	PRAWNS	MILKFISH	PRAWNS
NO. REPORTING	47.00	46.00	73.00	73.00	120.00	119.00
AVERAGE (ha)	20.98	20.36	28.42	19.29	25.51	19.70
STANDARD DEVIATION	20.16	21.24	58.97	20.43	47.69	20.66
MINIMUM VALUE (ha)	1.00	1.00	0.40	0.70	0.40	0.70
MAXIMUM VALUE (ha)	93.00	94.00	500.00	100.00	500.00	100.00
COEFFICIENT OF VARIATION	96.10	104.33	207.48	105.87	186.97	104.85

**Table 26**  
**PROPORTION OF TOTAL FISHPOND AREA DEVELOPED**

	FLA		PRIVATELY-OWNED		ALL	
	MILKFISH	PRAWNS	MILKFISH	PRAWNS	MILKFISH	PRAWNS
NO. REPORTING	47.00	0.89	70.00	72.00	117.00	118.00
MEAN (%)	0.89	0.84	0.91	0.85	0.91	0.85
STANDARD DEVIATION	0.18	0.20	0.15	0.20	0.16	0.20
MINIMUM VALUE (%)	0.12	0.30	0.47	0.30	0.12	0.30
MAXIMUM VALUE (%)	1.00	1.00	1.00	1.00	1.00	1.00
COEFFICIENT OF VARIATION (%)	19.89	24.23	16.73	23.93	17.98	23.95

Table 27  
DISTRIBUTION OF SAMPLE FISHPOND  
BY THEIR REASONS FOR NOT DEVELOPING TOTAL FISHPOND AREAS  
BY FISHPOND AUTHORIZATION, 1991.

REASONS FOR NOT DEVELOPING	AUTHORITY UNDER FISHPOND IS OPERATED					
	FLA No.	%	PRIVATELY-OWNED		ALL No.	%
			No.	%		
LACK OF FUNDS	29.00	54.72	29.00	46.03	58.00	50.00
UNSUITABLE AREA	15.00	28.30	22.00	34.92	37.00	31.91
INTENDED FOR RELATED ACTIVITY	—	—	2.00	3.17	2.00	1.72
NEW OPERATION	1.00	1.89	—	—	1.00	0.86
NO INTENTION OF EXPANDING	1.00	1.89	1.00	1.59	2.00	1.72
NO RESPONSE	57.00	13.20	9.00	14.29	16.00	13.79
ALL	53.00	100.00	63.00	100.00	116.00 a/	100.00

a/ some fishpond operators have developed 100% of their area.

Table 28  
DISTRIBUTION OF SAMPLE MILKFISH AND PRAWNS OPERATORS  
AS TO OWNERSHIP OF EQUIPMENT/MACHINERIES, 1991.

	LESS THAN/EQUAL TO 1		11 TO 20		GREATER THAN 20		ALL	
	No.	%	No.	%	No.	%	No.	%
EQUIPMENT/MACHINERIES USED								
HARVESTING NETS	36.00	5.48	12.00	38.71	43.00	34.13	91.00	39.57
MOTORIZED BANCA	17.00	49.32	12.00	38.71	28.00	22.22	57.00	24.78
WATER PUMPS	4.00	23.29	2.00	6.45	19.00	15.08	25.00	10.87
PADDLEWHEELS/AERATORS	3.00	5.48	—	—	9.00	7.14	12.00	5.22
GENERATOR	1.00	4.11	1.00	3.23	7.00	5.56	9.00	3.91
REFRACTOMETER/SALINOMETER	2.00	1.37	2.00	6.45	4.00	3.17	8.00	3.48
DISSOLVED OXYGEN METER	1.00	2.74	—	—	3.00	2.38	4.00	1.74
PH METER	2.00	1.37	1.00	3.23	6.00	4.76	9.00	3.91
TEST KITS	3.00	2.74	—	—	6.00	4.76	9.00	3.91
MISSING	4.00	4.11	1.00	3.23	1.00	0.79	6.00	2.61
ALL	73.00	100.00	31.00	100.00	126.00	100.00	230.00	100.00

Table 28 (PRAWNS)

Page 2

	LESS THAN/EQUAL TO 1		11 TO 20		GREATER THAN 20		ALL	
	No.	%	No.	%	No.	%	No.	%
EQUIPMENT/MACHINERIES USED								
HARVESTING NETS	54.00	16.77	24.00	20.87	35.00	0.50	113.00	17.74
MOTORIZED BANCA	34.00	10.56	13.00	11.30	28.00	17.50	75.00	11.77
WATER PUMPS	41.00	12.73	14.00	12.17	21.00	14.00	76.00	11.93
PADDLEWHEELS/AERATORS	32.00	9.94	11.00	9.57	18.00	10.50	61.00	9.58
GENERATOR	34.00	10.56	12.00	10.43	19.00	9.00	65.00	10.20
REFRACTOMETER/SALINOMETER	34.00	10.56	11.00	9.57	22.00	9.50	67.00	10.52
DISSOLVED OXYGEN METER	29.00	9.01	5.00	4.35	14.00	11.00	48.00	7.54
PH METER	35.00	10.87	14.00	12.17	24.00	7.00	73.00	11.46
TEST KITS	29.00	9.01	11.00	9.57	18.00	12.00	58.00	9.11
MISSING	—	—	—	—	1.00	9.00	1.00	0.16
ALL	322.00	100.00	115.00	100.00	200.00	100.00	637.00	100.00

Table 29  
DISTRIBUTION OF SAMPLE FISHPOND OPERATORS  
BY CULTURE METHOD

CULTURE METHOD	FLA		PRIVATELY-OWNED		ALL	
	No.	%	No.	%	No.	%
A. MILKFISH						
TRADITIONAL	15.00	12.30	22.00	18.03	37.00	30.33
EXTENSIVE	20.00	16.39	37.00	30.33	57.00	46.72
SEMI-INTENSIVE	12.00	9.84	11.00	9.02	23.00	18.85
INTENSIVE	—	—	3.00	2.46	3.00	2.46
MISSING	—	—	2.00	1.64	2.00	1.64
ALL	47.00	38.52	75.00	61.48	122.00	100.00
B. PRAWN						
TRADITIONAL	12.00	10.08	5.00	4.20	17.00	14.29
EXTENSIVE	13.00	10.92	12.00	10.08	25.00	21.01
SEMI-INTENSIVE	14.00	11.76	30.00	25.21	44.00	36.97
INTENSIVE	5.00	4.20	19.00	15.97	24.00	20.17
MISSING	2.00	1.68	7.00	5.88	9.00	7.56
ALL	46.00	38.66	73.00	61.34	119.00	100.00

**Table 30**  
**PROPORTION OF INPUT COST TO TOTAL OPERATING EXPENSES**  
**BY FISHPOND AUTHORIZATION AND BY SPECIES CULTURED, 1991.**

[illegible]



**Table 31**  
**AVERAGE INPUT COST PER CROPPING PER HECTARE**

	N	MEAN	STANDARD DEVIATION	MINIMUM	MAXIMUM
<b>A. MILKFISH</b>					
FLA	46.00	10596.67	23816.54	500.10	151200.00
PRIVATELY-OWNED	75.00	25934.96	66062.57	375.00	558210.40
ALL	121.00	20103.87	54405.01	375.00	558210.40
<b>B. PRAWNS</b>					
FLA	45.00	61591.26	63560.32	2224.00	248400.00
PRIVATELY-OWNED	67.00	73444.39	69189.09	680.00	260572.50
ALL	112.00	68681.97	66946.86	680.00	260572.50

**Table 32**  
**AVERAGE COST PER CROPPING PER HECTARE OF INPUTS USED**  
**BY SAMPLE MILKFISH AND PRAWNS FISHPOND OPERATORS BY CULTURE METHOD, AND**  
**FISHPOND AUTHORIZATION**

	TRADITIONAL		EXTENSIVE		SEMI-INTENSIVE		INTENSIVE		ALL	
	No.	AVE.	No.	AVE.	No.	AVE.	No.	AVE.	No.	AVE.
TOTAL COST										
MILKFISH	18.00	28,507.40	34.00	232,625.84	9.00	54,218.47	3.00	98,909.67	59.00	233,541.43
PRAWNS	12.00	34,942.09	13.00	57,291.67	13.00	142,783.32	5.00	201,689.17	38.00	104,105.94

**Table 33**  
**AVERAGE PRODUCTION OF SAMPLE FISHPOND OPERATORS**

	No.	AVERAGE	STANDARD DEVIATION	MINIMUM	MAXIMUM	COEFFICIENT OF VARIATION
<b>A. MILKFISH</b>						
FLA						
TRADITIONAL	15.00	538.20	308.93	165.00	1000.00	57.40
EXTENSIVE	20.00	939.30	1052.77	242.00	5000.00	112.08
SEMI-INTENSIVE	11.00	1866.55	977.25	800.00	3500.00	52.36
INTENSIVE	—	—	—	—	—	—
PRIVATELY-OWNED						
TRADITIONAL	22.00	972.32	1198.86	200.00	5783.00	123.30
EXTENSIVE	37.00	812.59	547.65	200.00	3000.00	67.40
SEMI-INTENSIVE	11.00	4183.82	3606.87	500.00	10000.00	86.21
INTENSIVE	3.00	2926.00	128.17	2778.00	3000.00	4.38
ALL						
TRADITIONAL	37.00	796.32	960.32	165.00	5783.00	120.59
EXTENSIVE	57.00	857.05	756.68	200.00	5000.00	88.29
SEMI-INTENSIVE	22.00	3025.18	2838.33	500.00	10000.00	93.82
INTENSIVE	3.00	2926.00	128.17	2778.00	3000.00	4.38
<b>B. PRAWNS</b>						
FLA						
TRADITIONAL	12.00	298.33	578.80	66.00	2125.00	194.01
EXTENSIVE	13.00	732.00	310.14	150.00	1250.00	42.37
SEMI-INTENSIVE	14.00	2105.29	1297.80	700.00	5600.00	61.64
INTENSIVE	5.00	3783.60	2190.34	1571.00	6667.00	57.89
PRIVATELY-OWNED						
TRADITIONAL	5.00	148.80	121.87	41.00	335.00	81.90
EXTENSIVE	12.00	900.50	560.75	267.00	2171.00	62.27
SEMI-INTENSIVE	30.00	3382.60	1967.69	576.00	8571.00	58.17
INTENSIVE	18.00	4389.83	2875.51	1333.00	14286.00	65.50
ALL						
TRADITIONAL	17.00	254.35	488.84	41.00	2125.00	192.19
EXTENSIVE	25.00	812.88	446.76	150.00	2171.00	54.96
SEMI-INTENSIVE	44.00	2976.18	1866.17	576.00	8571.00	62.70
INTENSIVE	23.00	4258.04	2706.85	1333.00	14286.00	63.57

**Table 34**  
**AVERAGE PROFITABILITY PER CROPPING PER HECTARE**  
**OF SAMPLE FISHPOND OPERATORS.**

	FLA									
	TRADITIONAL No.	AVE	EXTENSIVE No.	AVE	SEMI-INTENSIVE No.	AVE	INTENSIVE No.	AVE	ALL No.	AVE
<b>A. MILKFISH</b>										
AVERAGE PRODUCTION	15.00	538.20	20.00	939.30	11.00	1866.55	—	—	46.00	1030.24
AVERAGE PRICE	15.00	33.07	20.00	32.85	12.00	38.83	—	—	47.00	34.45
GROSS REVENUE / HA.	15.00	18870.67	20.00	31017.75	11.00	72359.55	—	—	46.00	36942.83
AVERAGE INPUT COST	15.00	8865.65	20.00	15001.68	12.00	10135.71	—	—	47.00	11801.00
AVERAGE PROFIT	15.00	10005.65	20.00	16016.07	11.00	61972.41	—	—	46.00	25045.50
<b>B. PRAWNS</b>										
AVERAGE PRODUCTION	12.00	298.33	13.00	732.00	14.00	2105.29	5.00	3783.60	44.00	1397.45
AVERAGE PRICE	12.00	132.75	13.00	136.54	14.00	148.82	5.00	150.00	44.00	140.94
GROSS REVENUE / HA.	12.00	26451.25	13.00	100828.46	14.00	330070.71	5.00	585526.00	44.00	208563.75
AVERAGE INPUT COST	12.00	14534.79	13.00	39363.27	14.00	103890.54	5.00	136166.00	44.00	63573.35
AVERAGE PROFIT	12.00	11916.46	13.00	59400.71	14.00	226180.18	5.00	449360.00	44.00	143830.21

Table 34  
Page 2

	PRIVATELY-OWNED									
	TRADITIONAL No.	AVE.	EXTENSIVE No.	AVE.	SEMI-INTENSIVE No.	AVE.	INTENSIVE No.	AVE.	ALL No.	AVE.
<b>A. MILKFISH</b>										
AVERAGE PRODUCTION	22.00	972.32	37.00	812.59	11.00	4183.82	3.00	2926.00	73.00	1455.58
AVERAGE PRICE	22.00	34.36	37.00	38.35	12.00	38.32	3.00	36.00	74.00	37.06
GROSS REVENUE / HA.	22.00	34365.00	37.00	31323.24	11.00	160009.09	3.00	104670.00	73.00	54645.21
AVERAGE INPUT COST	22.00	12095.50	37.00	37466.96	12.00	24278.66	3.00	50274.75	74.00	28158.97
AVERAGE PROFIT	22.00	22269.50	37.00	-6143.00	11.00	133646.01	3.00	54395.25	73.00	25971.28
<b>B. PRAWNS</b>										
AVERAGE PRODUCTION	5.00	148.80	12.00	900.50	30.00	3382.60	18.00	4389.83	65.00	2954.54
AVERAGE PRICE	5.00	119.60	12.00	152.92	30.00	159.50	19.00	165.79	66.00	157.09
GROSS REVENUE / HA.	5.00	19514.00	12.00	146984.58	30.00	529353.00	18.00	749917.78	65.00	480623.00
AVERAGE INPUT COST	5.00	19670.50	12.00	44600.13	30.00	92889.27	18.00	87760.13	65.00	75726.48
AVERAGE PROFIT	5.00	-156.50	12.00	102384.46	30.00	436463.73	17.00	659164.86	64.00	398867.90

Table 34

Page 3

	ALL									
	TRADITIONAL No.	AVE.	EXTENSIVE No.	AVE.	SEMI-INTENSIVE No.	AVE.	INTENSIVE No.	AVE.	ALL No.	AVE.
<b>A. MILKFISH</b>										
AVERAGE PRODUCTION	37.00	796.32	57.00	857.05	22.00	3025.18	3.00	2926.00	119.00	1291.16
AVERAGE PRICE	37.00	33.84	57.00	36.42	24.00	38.58	3.00	36.00	121.00	36.05
GROSS REVENUE / HA.	37.00	28083.51	57.00	31216.05	22.00	116184.32	3.00	104670.00	119.00	47802.27
AVERAGE INPUT COST	37.00	10786.10	57.00	295584.40	24.00	17207.18	3.00	50274.75	121.00	21857.13
AVERAGE PROFIT	37.00	17297.41	57.00	1631.65	22.00	97809.21	3.00	54395.25	119.00	25613.42
<b>B. PRAWNS</b>										
AVERAGE PRODUCTION	17.00	254.35	25.00	812.88	44.00	2976.18	23.00	4258.04	109.00	2325.99
AVERAGE PRICE	17.00	128.88	25.00	144.40	44.00	156.10	24.00	162.50	110.00	150.63
GROSS REVENUE / HA.	17.00	24410.88	25.00	122983.40	44.00	465945.00	23.00	714180.43	109.00	370800.92
AVERAGE INPUT COST	17.00	16045.29	26.00	41780.28	44.00	96389.67	23.00	98283.15	110.00	70843.53
AVERAGE PROFIT	17.00	8365.59	25.00	80032.91	44.00	369555.33	22.00	611481.94	108.00	294963.66

**Table 35**  
**AVERAGE DISPOSAL OF HARVEST OF FISHPOND OPERATORS**  
**BY FISHPOND AUTHORIZATION AND BY SPECIES CULTURED.**

[illegible]

**Table 36**  
**AVERAGE PRICES RECEIVED BY SAMPLE FISHPOND OPERATORS**  
**BY TYPE OF SPECIES CULTURED AND BY FISHPOND AUTHORIZATON (1990–1991).**

	MILKFISH			PRAWNS			ALL		
	FLA	PRIVATELY- OWNED	ALL	FLA	PRIVATELY- OWNED	ALL	FLA	PRIVATELY- OWNED	ALL
LOWEST PRICE RECEIVED:1990(P/KL)	26.51	27.85	27.33	113.07	116.80	115.31	68.36	70.09	69.40
HIGHEST PRICE RECEIVED:1990(P/KL)	39.85	42.73	41.60	182.56	190.26	187.19	109.56	113.88	112.21
LOWEST PRICE RECEIVED:1991(P/KL)	27.81	28.10	27.98	99.10	106.44	103.50	62.26	65.57	64.26
HIGHEST PRICE RECEIVED:1991(P/KL)	41.32	42.79	42.21	169.56	174.01	172.24	104.04	106.53	105.54



**Table 37**  
**MAJOR CONSTRAINTS THAT PREVENTED ATTAINMENT**  
**OF MAXIMUM PRODUCTION LEVEL OF SAMPLE FISHPOND OPERATORS, 1991.**

CONSTRAINT RANK	FLA			PRIVATELY-OWNED			ALL		
	MILKFISH No.	PRAWNS No.	ALL No.	MILKFISH No.	PRAWNS No.	ALL No.	MILKFISH No.	PRAWNS No.	ALL No.
<b>LIMITED OPERATING CAPITA</b>									
RANK 1	11.00	15.00	26.00	19.00	14.00	32.00	30.00	28.00	58.00
RANK 2	3.00	1.00	4.00	—	3.00	3.00	3.00	4.00	7.00
RANK 3	3.00	3.00	6.00	—	6.00	6.00	3.00	9.00	12.00
MISSING	2.00	—	2.00	4.00	6.00	8.00	6.00	4.00	10.00
ALL	19.00	19.00	36.00	23.00	19.00	46.00	42.00	45.00	87.00
<b>NO TECHNICAL INFORMATION AVAILABLE</b>									
RANK 1	—	2.00	2.00	1.00	—	1.00	1.00	2.00	3.00
RANK 2	3.00	4.00	7.00	2.00	4.00	6.00	5.00	8.00	13.00
RANK 3	2.00	2.00	4.00	5.00	1.00	6.00	7.00	3.00	10.00
MISSING	2.00	—	2.00	3.00	4.00	7.00	5.00	4.00	9.00
ALL	7.00	8.00	15.00	11.00	9.00	20.00	18.00	17.00	35.00
<b>HIGH INPUT COST</b>									
RANK 1	—	—	—	—	—	—	—	—	—
RANK 2	4.00	12.00	16.00	15.00	13.00	28.00	5.00	8.00	13.00
RANK 3	8.00	5.00	13.00	8.00	10.00	18.00	7.00	3.00	10.00
MISSING	—	—	—	—	—	—	—	—	—
ALL	12.00	17.00	29.00	23.00	23.00	46.00	12.00	11.00	23.00
<b>NON-AVAILABILITY OF FRY</b>									
RANK 1	1.00	1.00	2.00	—	1.00	1.00	1.00	2.00	3.00
RANK 2	7.00	1.00	8.00	4.00	2.00	6.00	3.00	2.00	5.00
RANK 3	2.00	1.00	3.00	2.00	1.00	3.00	1.00	3.00	4.00
MISSING	2.00	—	2.00	4.00	4.00	8.00	6.00	4.00	10.00
ALL	12.00	3.00	15.00	10.00	8.00	18.00	11.00	11.00	22.00
<b>UNSUITABLE PROJECT SITE</b>									
RANK 1	1.00	1.00	2.00	—	1.00	1.00	1.00	2.00	3.00
RANK 2	1.00	—	1.00	2.00	2.00	4.00	3.00	2.00	5.00
RANK 3	—	2.00	2.00	1.00	1.00	2.00	1.00	3.00	4.00
MISSING	2.00	—	2.00	3.00	4.00	7.00	5.00	4.00	9.00
ALL	4.00	3.00	7.00	6.00	8.00	14.00	10.00	11.00	21.00

Table 37  
Page 2

PEACE AND ORDER									
RANK 1	1.00	—	1.00	—	—	—	1.00	—	1.00
RANK 2	—	—	—	—	—	—	—	—	—
RANK 3	—	—	—	2.00	—	2.00	2.00	—	2.00
MISSING	2.00	—	2.00	3.00	4.00	7.00	5.00	4.00	9.00
ALL	3.00	—	3.00	5.00	4.00	9.00	8.00	4.00	12.00
LOW PRODUCE PRICE									
RANK 1	—	1.00	1.00	2.00	7.00	9.00	2.00	8.00	10.00
RANK 2	—	3.00	3.00	4.00	6.00	10.00	4.00	9.00	13.00
RANK 3	3.00	8.00	11.00	6.00	12.00	18.00	9.00	20.00	29.00
MISSING	2.00	—	2.00	4.00	4.00	8.00	6.00	4.00	9.00
ALL	5.00	12.00	17.00	16.00	29.00	45.00	21.00	41.00	13237.00
WEATHER PROBLEMS									
RANK 1	4.00	2.00	6.00	5.00	6.00	11.00	9.00	8.00	17.00
RANK 2	1.00	2.00	3.00	2.00	2.00	4.00	3.00	4.00	7.00
RANK 3	—	1.00	1.00	1.00	1.00	2.00	1.00	2.00	3.00
MISSING	2.00	—	2.00	4.00	4.00	8.00	6.00	4.00	10.00
ALL	7.00	5.00	12.00	12.00	13.00	25.00	19.00	18.00	37.00
DISEASE PROBLEMS									
RANK 1	—	—	—	1.00	5.00	6.00	1.00	5.00	6.00
RANK 2	2.00	1.00	3.00	1.00	1.00	2.00	3.00	2.00	5.00
RANK 3	—	—	—	—	2.00	2.00	—	2.00	2.00
MISSING	2.00	—	2.00	3.00	4.00	7.00	5.00	4.00	9.00
ALL	4.00	1.00	5.00	5.00	12.00	17.00	8.00	13.00	22.00
OTHERS <sup>a/</sup>	1.00	1.00	2.00	1.00	2.00	3.00	2.00	1.00	2.00

a/ e.g. poor fry quality, no electricity

**Table 38**  
**AVERAGE PROPORTION OF CAPITAL OBTAINED BY**  
**SAMPLE FISHPOND OPERATORS FROM VARIOUS SOURCES**  
**BY SPECIES AND BY FISHPOND AUTHORIZATION, 1991.**

[illegible]

**Table 39**  
**DISTRIBUTION OF SAMPLE FISHPOND OPERATORS**  
**BY SOURCE OF OWN CAPITAL, BY FISHPOND AUTHORIZATION**  
**AND BY SPECIES, 1991.**

SOURCES	FLA						PRIVATELY - OWNED						ALL					
	MILKFISH No.	%	PRAWNS No.	%	ALL No.	%	MILKFISH No.	%	PRAWNS No.	%	ALL No.	%	MILKFISH No.	%	PRAWNS No.	%	ALL No.	%
PROFITS FROM FISHPOND	40.00	49.38	38.00	45.80	78.00	47.56	65.00	43.33	60.00	44.44	125.00	43.86	105.00	45.45	98.00	44.95	203.00	45.21
PROFITS FROM OTHER BUSINESS	24.00	29.63	27.00	32.53	51.00	31.10	47.00	31.33	51.00	37.78	98.00	34.34	71.00	30.74	78.00	35.78	149.00	33.18
ADDITIONAL EQUITY	2.00	2.47	2.00	2.41	4.00	2.44	5.00	3.33	8.00	4.44	11.00	3.86	7.00	3.03	8.00	3.67	15.00	3.34
SAVINGS	13.00	16.05	9.00	10.84	22.00	13.41	21.00	14.00	7.00	5.19	28.00	9.82	34.00	14.72	16.00	7.34	50.00	11.13
SALE OF ASSETS	1.00	1.23	3.00	3.61	4.00	2.44	6.00	4.00	8.00	5.93	14.00	4.91	7.00	3.03	11.00	5.05	18.00	4.01
SALARY FROM EMPLOYMENT	1.00	1.23	2.00	2.41	3.00	1.83	4.00	2.67	1.00	0.74	5.00	1.75	5.00	2.16	3.00	1.38	8.00	1.78
MONEY GIVEN BY CHILDREN/RELATIVES	-	-	1.00	1.20	1.00	0.61	-	-	1.00	0.74	1.00	0.35	-	-	2.00	0.92	2.00	0.45
NO RESPONSE	-	-	1.00	1.20	1.00	0.61	2.00	1.33	1.00	0.74	3.00	1.05	2.00	0.87	2.00	0.92	4.00	0.89
ALL	81.00	100.00	83.00	100.00	164.00	100.00	150.00	100.00	135.00	100.00	285.00	100.00	231.00	100.00	218.00	100.00	449.00	100.00

**Table 40**  
**DISTRIBUTION OF SAMPLE FISHPOND OPERATORS**  
**BY LOAN PURPOSE AND BY SOURCE OF CREDIT**  
**(BANKING INSTITUTION)**

LOAN PURPOSE	FLA			PRIVATELY-OWNED			ALL		
	MILKFISH	PRAWNS	ALL	MILKFISH	PRAWNS	ALL	MILKFISH	PRAWNS	ALL
<b>A. BANKING INSTITUTION</b>									
POND DEVELOPMENT/EXPANSION	1.00	5.00	6.00	1.00	8.00	9.00	1.00	13.00	14.00
WORKING CAPITAL	—	5.00	5.00	4.00	8.00	12.00	5.00	13.00	18.00
FIXED ASSETS	—	3.00	3.00	1.00	1.00	2.00	1.00	4.00	5.00
ALL	1.00	13.00	14.00	6.00	17.00	23.00	7.00	30.00	37.00
<b>B. INFORMAL LENDERS</b>									
POND DEVELOPMENT/EXPANSION	5.00	1.00	6.00	—	1.00	1.00	5.00	2.00	7.00
WORKING CAPITAL	5.00	1.00	6.00	—	1.00	1.00	5.00	2.00	7.00
FIXED ASSETS	1.00	—	1.00	—	—	—	1.00	—	1.00
ALL	11.00	2.00	13.00	—	2.00	2.00	11.00	4.00	15.00

**Table 41**  
**LOANS BORROWED BY FISHPOND OPERATORS**  
**FROM BANKING INSTITUTIONS BY FISHPOND AUTHORIZATION**  
**AND BY SPECIES CULTURED.**

	FLA			PRIVATELY-OWNED			ALL		
	MILKFISH	PRAWNS	ALL	MILKFISH	PRAWNS	ALL	MILKFISH	PRAWNS	ALL
AVERAGE LOAN AMOUNT (PESOS)	265875.00	975555.00	570023.81	1445954.55	3029076.92	2303479.17	830260.87	2189000.00	1494533.33
AVERAGE LOAN MATURITY (YRS.)	6.88	5.36	6.32	3.52	4.80	4.19	5.44	5.03	5.25
AVERAGE INTREST RATE (%)	19.45	21.63	20.42	16.67	22.00	19.46	18.06	21.84	19.90

**Table 42**  
**TYPES OF COLLATERAL OFFERED BY SAMPLE FISHPOND**  
**OPERATORS BY FISHPOND AUTHORIZATION**

	FLA			PRIVATELY-OWNED			ALL		
	MILKFISH	PRAWNS	ALL	MILKFISH	PRAWNS	ALL	MILKFISH	PRAWNS	ALL
REM	6.00	3.00	9.00	6.00	9.00	17.00	14.00	12.00	26.00
FARMLAND	3.00	1.00	4.00	—	—	—	3.00	1.00	4.00
FISHPOND AREA	8.00	6.00	14.00	8.00	4.00	12.00	16.00	10.00	26.00
CHattel	3.00	2.00	5.00	8.00	4.00	11.00	10.00	6.00	16.00
CHARACTER LOAN	1.00	1.00	2.00	—	—	—	1.00	1.00	2.00
ALL	21.00	21.00	34.00	23.00	17.00	40.00	44.00	30.00	74.00

**Table 43**  
**DISTRIBUTION OF SAMPLE FISHPOND OPERATORS ON**  
**REASONS FOR NOT BORROWING IF CREDIT IS AVAILABLE**  
**BY FISHPOND AUTHORIZATION.**

REASONS	FLA		PRIVATELY-OWNED		ALL	
	MILKFISH No.	PRAWNS %	MILKFISH No.	PRAWNS %	MILKFISH No.	PRAWNS %
A. NO NEED TO BORROW						
PERSONAL FUNDS AVAILABLE	18.00	31.58	28.00	32.56	46.00	32.17
FISHPOND NEEDS NO IMPROVEMENT	4.00	7.02	10.00	11.63	14.00	9.79
FISHPOND OPERATION SUSTAINABLE	7.00	12.28	8.00	9.30	15.00	10.49
B. THERE'S A NEED TO BORROW						
RED TAPES IN LOAN APPLICATION	3.00	5.26	7.00	8.14	10.00	6.99
HIGH INTEREST RATES	13.00	22.81	6.00	6.98	19.00	13.29
STILL WITH OUTSTANDING BALANCE IN BANKS	2.00	3.51	1.00	1.16	3.00	2.10
NO ANSWER	10.00	17.54	26.00	30.23	36.00	25.17
ALL	57.00	100.00	86.00	100.00	143.00	100.00



**Table 44**  
**AVERAGE TIME AND AMOUNT SPENT BY SAMPLE FISHPOND OPERATORS IN**  
**AVAILING OF CREDIT FROM BANKING INSTITUTION**

	FLA						PRIVATELY-OWNED						ALL					
	MILKFISH No.	AVE	PRAWNS No.	AVE	ALL No.	AVE	MILKFISH No.	AVE	PRAWNS No.	AVE	ALL No.	AVE	MILKFISH No.	AVE	PRAWNS No.	AVE	ALL No.	AVE
<b>AMOUNT SPENT</b>																		
AVERAGE TRANSPORTATION COST	3.00	533.33	9.00	204.44	12.00	288.67	10.00	290.50	4.00	432.50	14.00	331.07	13.00	346.54	13.00	274.62	28.00	310.58
AVERAGE FOOD COST	3.00	300.00	8.00	266.67	9.00	277.78	4.00	150.00	4.00	187.50	8.00	168.75	7.00	214.29	10.00	235.00	17.00	226.47
AVERAGE FEES PAID	3.00	491.67	7.00	743.33	10.00	667.83	8.00	421.56	3.00	1255.00	11.00	648.86	11.00	440.68	10.00	896.83	21.00	657.90
AVERAGE TOTAL COST	5.00	1095.00	11.00	1437.27	18.00	1330.31	11.00	917.43	6.00	1481.67	17.00	1118.57	16.00	972.92	17.00	1452.94	33.00	1220.20
OPPORTUNITY COST OF TIME (PESOS)	8.00	798.75	2.00	1700.00	8.00	1024.06	7.00	1006.43	1.00	600.00	8.00	955.63	13.00	910.53	3.00	1333.33	16.00	989.84
TOTAL TRANSACTIONS COST (PESOS)		1893.75		3137.27		2354.37		1923.86		2081.67		2072.2		1883.5		2786.27		2210.04
TRANSACTION COST PER 1,000 PESOS		7.15		3.21		4.13		1.33		0.69		0.9		2.27		1.27		1.48
<b>TIME</b>																		
TOTAL TIME (HOUR)	10.00	38.10	8.00	389.03	18.00	194.07	11.00	50.55	3.00	42.00	14.00	48.71	21.00	44.62	11.00	294.39	32.00	130.48
ESTIMATED COST OF TIME (PESOS/HOUR)	7.00	274.82	2.00	37.50	9.00	222.08	9.00	81.36	1.00	50.00	10.00	78.23	18.00	166.00	3.00	41.67	19.00	146.37
OPPORTUNITY COST OF TIME	6.00	798.75	2.00	1700.00	8.00	1024.06	7.00	1006.43	1.00	600.00	8.00	955.63	13.00	910.58	3.00	1333.33	16.00	989.84
BANK PROCESSING TIME (IN DAYS)	11.00	35.73	10.00	21.10	21.00	28.76	11.00	27.46	9.00	39.56	20.00	32.90	22.00	31.59	19.00	29.84	41.00	30.78

**Table 45**  
**BORROWINGS OF SAMPLE FISHPOND OPERATORS**  
**FROM INFORMAL SOURCES.**

	FLA						PRIVATELY-OWNED						ALL					
	MILKFISH No.	AVE.	PRAWNS No.	AVE.	ALL No.	AVE.	MILKFISH No.	AVE.	PRAWNS No.	AVE.	ALL No.	AVE.	MILKFISH No.	AVE.	PRAWNS No.	AVE.	ALL No.	AVE.
VE. CASH AMOUNT BORROWED	24.00	47291.04	27.00	28073.33	51.00	37116.96	53.00	21885.92	21.00	51427.76	74.00	30269.42	77.00	29804.40	48.00	38290.90	125.00	33063.22
VE. AMOUNT OF BORROWED GOODS	47.00	798412.71	48.00	799509.50	93.00	798955.21	74.00	798412.00	73.00	799030.98	147.00	798719.38	121.00	798412.28	119.00	799215.95	240.00	798810.77
VE. LOAN MATURITY (MOS.)	7.00	52.28	9.00	15.83	16.00	31.78	6.00	2.85	5.00	7.40	11.00	4.92	13.00	29.47	14.00	12.85	27.00	20.84
VE. ANNUAL INTEREST (%)	4.00	10.25	7.00	10.71	11.00	10.55	5.00	5.00	4.00	9.88	9.00	7.17	9.00	7.33	11.00	10.41	20.00	9.02
VE. MARKET VALUE OF COLLATERAL	0.00	-	1.00	450000.00	1.00	450000.00	0.00	-	1.00	450000.00	1.00	450000.00	0.00	-	2.00	450000.00	2.00	450000.00

Table 46  
TRANSACTION COST OF SAMPLE FISHPOND OPERATORS IN  
AVAILING OF CREDIT FROM INFORMAL SOURCES.

	FLA				PRIVATELY-OWNED						ALL							
	MILKFISH No.	AVE	PRAWNS No.	AVE	ALL No.	AVE	MILKFISH No.	AVE	PRAWNS No.	AVE	ALL No.	AVE	MILKFISH No.	AVE	PRAWNS No.	AVE	ALL No.	AVE
<b>COST</b>																		
AVE. TRANSPORTATION COST	10.00	68.20	8.00	87.50	18.00	76.78	5.00	42.00	5.00	119.00	10.00	80.50	15.00	59.47	13.00	99.62	28.00	78.11
AVE. FOOD COST	9.00	35.00	6.00	53.33	15.00	42.33	2.00	30.00	1.00	50.00	3.00	36.67	11.00	34.09	7.00	52.86	18.00	41.39
AVE. FEES PAID	1.00	30.00	3.00	200.00	4.00	157.50	3.00	133.33	1.00	100.00	4.00	125.00	4.00	107.50	4.00	175.00	8.00	141.25
TOTAL COST	10.00	99.70	7.00	222.86	17.00	150.41	5.00	134.00	4.00	138.25	9.00	135.00	15.00	111.13	11.00	191.36	26.00	145.06
OPPORTUNITY COST OR TIME (PESO)	12.00	328.61	5.00	284.56	20.00	324.53	6.00	607.20	5.00	532.00	11.00	706.31	18.00	596.83	13.00	378.55	31.00	503.28
TOTAL TRANSACTION COST (PESO)		428.31		507.42		474.94		941.20		666.25		841.31		706.00		509.91		648.28
TRANSACTION COST PER 1,000 PESOS		0.51		0.61		0.57		1.15		0.78		1.05		0.85		0.68		0.78
<b>TIME</b>																		
TOTAL TIME (HRS)	12.00	19.88	8.00	10.31	20.00	16.05	6.00	11.16	5.00	13.62	11.00	12.29	18.00	16.98	13.00	11.58	31.00	14.72
ESTIMATED COST TIME (PESO/HR)	10.00	16.53	5.00	27.60	15.00	20.22	5.00	72.20	4.00	39.06	9.00	57.47	15.00	35.09	9.00	32.69	24.00	34.19
OPPORTUNITY COST OF TIME (PESOS)	12.00	328.61	5.00	284.56	20.00	324.53	6.00	607.20	5.00	532.00	11.00	706.31	18.00	596.83	13.00	378.55	31.00	503.28

**Table 47**  
**DISTRIBUTION OF SAMPLE FISHPOND OPERATORS**  
**WITH RESPECT TO EFFECT OF CARP.**

EFFECT	FLA		PRIVATELY-OWNED		ALL	
	No.	%	No.	%	No.	%
NO EFFECT	55.00	22.92	84.00	35.00	139.00	57.92
NEGATIVE EFFECT	38.00	15.83	63.00	26.25	101.00	42.08
TOTAL	93.00	38.75	147.00	61.25	240.00	100.00

**Table 48**  
**DISTRIBUTION OF SAMPLE FISHPOND OPERATORS ON**  
**THE NEGATIVE EFFECT OF CARP ON CREDIT AVAILMENT FROM BANKS.**

	FLA			PRIVATELY-OWNED			ALL		
	MILKFISH	PRAWNS	ALL	MILKFISH	PRAWNS	ALL	MILKFISH	PRAWNS	ALL
FISHFARM UNACCEPTED AS COLLATERAL	12.00	10.00	22.00	21.00	22.00	43.00	33.00	32.00	65.00
CREDIT TO FISHFARM BECAME LIMITED TO ONLY 5 has.	5.00	6.00	11.00	7.00	11.00	18.00	12.00	17.00	29.00
BANKS STOPPED LENDING TO FISHFARM	10.00	3.00	13.00	9.00	7.00	16.00	19.00	10.00	29.00
LONGER PROCESSING TIME OF LOAN	—	1.00	1.00	2.00	1.00	3.00	2.00	2.00	4.00
LOANS LIMITED TO SHORT TERM LENDING	1.00	1.00	2.00	—	—	—	1.00	1.00	2.00
NO RESPONSE	1.00	1.00	2.00	5.00	3.00	8.00	6.00	4.00	10.00
ALL	29.00	22.00	51.00	44.00	44.00	88.00	73.00	66.00	139.00

Table 49  
REASONS WHY CARP DOES NOT AFFECT CREDIT  
ACCESS FROM BANKS.

	FLA			PRIVATELY-OWNED			ALL		
	MILKFISH	PAWNS	ALL	MILKFISH	PAWNS	ALL	MILKFISH	PAWNS	ALL
BANKS DO NOT LEND ON THE BASIS ALONE OF FISHFARM	6.00	13.00	19.00	8.00	13.00	21.00	14.00	26.00	40.00
BANKS ARE MORE INTERESTED IN CASH FLOWS	2.00	7.00	9.00	9.00	11.00	20.00	11.00	18.00	29.00
LOANS CONTRACTED ARE WITH MARKETING TIE-UP	-	3.00	3.00	2.00	6.00	8.00	2.00	9.00	11.00
LOANS CONTRACTED IS COVERED WITH DEPOSITS	-	-	-	2.00	5.00	7.00	2.00	5.00	7.00
PROGRAM IS STILL AT AN EARLY STAGE	-	-	-	1.00	-	1.00	1.00	-	1.00
NO TRANSACTIONS MADE	19.00	15.00	34.00	28.00	26.00	54.00	47.00	41.00	88.00
NO RESPONSE	1.00	1.00	2.00	7.00	5.00	12.00	8.00	6.00	14.00
ALL	28.00	39.00	67.00	57.00	66.00	123.00	85.00	105.00	190.00

**Table 50**  
**REASONS WHY CARP DOES NOT AFFECT CREDIT**  
**ACCESS FROM INFORMAL LENDERS.**

	FLA			PRIVATELY-OWNED			ALL		
	MILKFISH	PRAWNS	ALL	MILKFISH	PRAWNS	ALL	MILKFISH	PRAWNS	ALL
TRANSACTIONS BASED ON PERSONALISTIC LINKAGE	18.00	22.00	40.00	17.00	19.00	36.00	35.00	41.00	76.00
SOURCE OF LOAN IS ALSO THE BUYER	14.00	8.00	22.00	8.00	2.00	10.00	22.00	10.00	32.00
NO TRANSACTION MADE	20.00	21.00	41.00	34.00	40.00	74.00	54.00	60.00	115.00
INFORMAL LENDERS DO NOT LEND ON FISHFARM BASIS ALONE	1.00	—	1.00	1.00	—	1.00	2.00	—	2.00
NO REPOSE	3.00	1.00	4.00	15.00	8.00	23.00	18.00	9.00	22.00
ALL	56.00	52.00	108.00	75.00	69.00	144.00	131.00	120.00	251.00

Table 51  
DISTRIBUTION OF SAMPLE BANKS BY TYPE AND BY LOCATION

Location	TYPE OF BANKS					
	Private Commercial Bank	Private Development Bank	Rural Bank	LBP Field Office	DBP	All Banks
Iloilo	3		2	1	1	7
Capiz			1		1	2
Aklan	1		1	1		3
Negros Occidental	3	1	1	1		6
All	7	1	5	3	2	18



Table 52  
PROFILE OF THE SAMPLE BANKS BY TYPE  
As of 1991

	TYPE OF BANKS					All Banks
	Private Commercial Bank	Private Development Bank	Rural Bank	LBP Field Office	DBP	
Mean No. of Years in Operation	13.29	15.00	21.60	1.83	39.50	16.69
Mean No. of Depositor Accounts	10,856.86	12,415.00	9,886.20	0.00 *	2,157.00	7,897.67
Mean No. of Borrower Accounts	184.86	1,298.00	1,096.20	123.67	711.50	548.17
Mean No. of Agricultural Borrowers	29.43	152.00	885.00	122.00	93.50	296.44
Mean No. of Aquaculture Borrowers	11.29	53.00	47.40	3.67	64.00	28.22
Mean No. Fisheries/Non Aquaculture	2.00	0.00	0.00	2.33	1.50	1.33
Mean No. of Non-fisheries Accounts	4.29	99.00	841.60	116.00	28.00	273.06
Mean No. of Non-agricultural Accounts	138.29	1,146.00	210.80	1.33	618.00	244.89

\*LBP-FO has no deposit-taking function.

Table 53  
EXTENT OF CREDIT RATIONING AMONG SAMPLE BANKS  
BY TYPE OF BANK AND BORROWER  
As of 1991

Type of Borrower	TYPE OF BANK					ALL
	Private Commercial Bank	Private Development Bank	Rural Bank	LBP-FO	DBP	
Fishpond Operators						
----- Mean No. of Applicants	9.00	58.00	79.00	4.00	35.00	33.00
Mean Percentage Approval (%)	17.86	42.00	14.10	2.73	51.50	19.37
Mean Percentage Rejection (%)	82.14	58.00	85.90	97.27	48.50	80.63
Agricultural Borrowers						
----- Mean No. of Applicants	17.00	105.00	832.00	118.00	200.00	285.00
Mean Percentage Approval (%)	14.59	7.60	44.17	96.45	14.00	35.99
Mean Percentage Rejection (%)	52.41	92.40	55.83	3.55	86.00	64.01
Non-Agricultural Loans						
----- Mean No. of Applicants	31.00	1,246.00	250.00	1.00	250.00	179.00
Mean Percentage Approval (%)	65.91	88.20	41.74	0.67	34.50	46.07
Mean Percentage Rejection (%)	34.09	11.80	58.26	99.33	65.50	53.93
All						
----- Mean No. of Applicants	19.00	470.00	388.00	41.00	161.00	166.00
Mean Percentage Approval (%)	32.79	45.93	33.34	33.28	33.33	33.81
Mean Percentage Rejection (%)	67.21	54.07	66.66	66.72	66.67	66.19

**Table 54****TYPE OF LOAN**

Table 55  
MEAN LOAN-COLLATERAL RATIO BY TYPE OF COLLATERAL AND BY TYPE OF BANK

	TYPE OF BANK					
	PRIVATE COMMERCIAL BANK	PRIVATE DEVELOPMENT BANK	RURAL BANK	LBP-FO <sup>a/</sup>	DBP	ALL
	No.	No.	No.	No.	No.	No.
Non-Agricultural Real Estate	57.57	60.00	64.00		70.00	60.93
Agricultural Real Estate	53.75	60.00	65.00			60.00

<sup>a/</sup> loan amount does not depend on the collateral value but on production cost

**Table 56**  
**SUFFICIENCY OF COLLATERAL BY TYPE OF BANK**

	TYPE OF BANK					
	PRIVATE COMMERCIAL BANK	PRIVATE DEVELOPMENT BANK	RURAL BANK	LBP-FO	DBP	ALL
<b>Non-Agricultural Real Estate</b>						
Sufficient	5		3		1	9
Insufficient	2	1	1		1	5
<b>Agricultural Real Estate</b>						
Sufficient	1		3			4
Insufficient	5	1	2	3	1	12

**Table 57**  
**REASONS FOR THE UNACCEPTABILITY/INSUFFICIENCY OF OTHER COLLATERALS**  
**BY TYPE AND BY BANK**

REASONS	Private Commercial Bank	Private Development Bank	Rural Bank	LBP-FO	DBP	All
<b>I. Emancipation Patents</b>						
Public property no value as collateral	4	1	1	-	1	7
Subject to legal restrictions/controversies	4	-	1	-	-	5
Bank does not deal with land as collateral	-	-	-	1	-	1
Difficult to mortgage	2	-	2	-	-	4
Borrowers not offered EPS as collateral	-	-	-	1	1	2
<b>II. FLAS</b>						
Public property no value as collateral	4	1	3	-	1	9
Bank does not deal with untitled properties	3	-	1	-	-	4
Bank cannot foreclose	1	-	2	-	-	3
Subject to Legal restrictions	1	-	-	-	-	1
Does not deal with land as collateral	-	-	-	1	-	1
Not offered as collateral	-	-	-	1	-	1
<b>III. Credit Guarantees</b>						
Unnecessary expense since loans are collateralized	-	1	2	-	-	3
No applicant	-	-	-	-	1	1
No loan value	-	-	-	-	1	1
Not sufficient as collateral	1	-	-	-	-	1
Slow loan processing of guarantee institutions	1	-	-	-	-	1

Table 58  
OTHER REQUIREMENTS OF BANKS FOR LOAN APPROVAL BY TYPE OF BANK

Type of Bank	Mean Equity Requirement	Mean Minimum Loan Size	Mean Maximum Loan Size
	Mean	Mean	Mean
Private Commercial Bank	51.43	564,285.86	153,000,000.00
Private Development Bank	70.00	10,000.00	1,500,000.00
Rural Bank	35.00	2,700.00	244,000.00
LBP-FO	20.00	6,000.00	150,000.00
DBP	25.00	150,000.00	a/
All	40.00	252,088.29	28,106,363.64

a/ not indicated

Table 59  
AVERAGE LOAN SIZE BY TYPE OF LOAN AND BY TYPE OF BANK  
(AS OF 1991)

TYPE OF LOAN	TYPE OF BANK					
	PRIVATE COMMERCIAL BANK	PRIVATE DEVELOPMENT BANK	RURAL BANK	LBP-FO	DBP	ALL BANKS
Aquaculture	1,521,428.57	32,000.00	52,200.00	171,666.67	775,000.00	722,666.67
Bangus	750,000.00	a/	51,500.00	227,000.00	700,000.00	446,382.35
Prawn	2,092,857.14	a/	71,250.00	50,000.00	850,000.00	1,115,666.67
Agri/Non-Aquaculture	2,492,857.14	103,172.00	20,000.00	368,666.67	1,500,000.00	1,208,842.89
Non-Agriculture	2,135,714.29	18,015.00	20,600.00	0.00	1,625,000.00	1,145,063.44

a/ not available



Table 60  
IMPACT OF CARP ON BANKS' OPERATION BY TYPE OF BANK

Impact	Private Commercial Bank	Private Development Bank	Rural Bank	LBP-FO	DBP	All
Negative Effects	5.00	1.00	3.00		1.00	10.00
Positive Effects				3.00		3.00
No Effect	2.00		2.00			4.00

Table 61  
REASONS FOR THE NEGATIVE IMPACT OF CARP ON BANKS' OPERATION  
BY TYPE OF BANK

REASON	TYPE OF BANK					
	PRIVATE COMMERCIAL BANK	PRIVATE DEVELOPMENT BANK	RURAL BANK	SPECIALIZED GOVERNMENT BANK-LBP	SGB-DBP	ALL BANKS
Loan value is reduced due to a lower value of agri land	1.00		2.00			3.00
Potential borrower of banks is reduced due to unaccep- tability of agri land as collateral	5.00	1.00	1.00		1.00	8.00
Loan value reduced since loan is pegged to only 5 has.	1.00					1.00

Table 82  
REASONS FOR A NO EFFECT IMPACT OF CARP ON BANKS' OPERATIONS

	TYPE OF BANK					ALL BANKS
	PRIVATE COMMERCIAL BANK	PRIVATE DEVELOPMENT BANK	RURAL BANK	LBP-FO	DBP	
Clients have other collateral to offer	1.00					1.00
Minimal exposure on agri credit	1.00					1.00
Biggest problem on repayment is the client not the collateral	2.00					2.00
Effect of CARP will be minimal since clients are small land holders			2.00			2.00
<b>TOTAL</b>	<b>4.00</b>		<b>2.00</b>			<b>6.00</b>

Table 63  
BANK'S SUGGESTED FINANCING SCHEME FOR FISHPOND  
OPERATORS UNDER CARP BY TYPE OF BANK

FINANCING SCHEMES	TYPE OF BANK					
	PRIVATE COMMERCIAL BANK	PRIVATE DEVELOPMENT BANK	RURAL BANK	LBP-FO	DBP	ALL BANKS
Rediscounting facility	3.00	1.00	4.00			8.00
Increase Technical services			1.00	2.00		3.00
Increase Training of bank personnel	1.00		2.00			3.00
Better Info. Dissemination	1.00		1.00			2.00
Subsidized credit	2.00		1.00	1.00	1.00	5.00
Specialized loan fund	4.00		3.00		2.00	9.00
Buy-back scheme (100% guarantee)	1.00					1.00
Market driven credit	1.00					1.00
Cooperative lending				1.00		1.00
ALL	13.00	1.00	12.00	4.00	3.00	33.00

**Table 54**  
**LOANS GRANTED BY TYPE OF LOAN AND BY BANK**  
**1986-1991 (At constant prices, Base Year = 1972)**

Type of Bank/Borrower	1986		1987		1988		1989		1990		1991		Average		Compounded Ave. Annual Growth Rate (%)	
	No. of Borrowers	Loan Amount	No. of Borrowers	Loan Amount	No. of Borrowers	Loan Amount	No. of Borrowers	Loan Amount	No. of Borrowers	Loan Amount	No. of Borrowers	Loan Amount	No. of Borrowers	Loan Amount	No. of Borrowers	Loan Amount
<b>Private Commercial Bank</b>																
Agriculture	28	3,478,327	28	3,404,159	38	6,055,872	52	8,808,333	41	5,917,548	105	8,823,758	49	5,748,168	30.26	20.46
Fishpond	37	3,565,847	36	2,774,585	71	15,101,039	73	12,867,950	76	8,271,908	83	6,718,218	63	8,216,557	17.54	13.51
Non-Agri	322	22,777,384	385	21,020,839	491	23,384,884	578	27,149,947	648	18,979,554	832	41,563,879	543	25,809,381	20.91	12.78
<b>Total</b>	<b>387</b>	<b>29,821,358</b>	<b>449</b>	<b>27,199,583</b>	<b>600</b>	<b>44,521,795</b>	<b>703</b>	<b>46,827,230</b>	<b>765</b>	<b>33,169,010</b>	<b>1,020</b>	<b>57,105,852</b>	<b>654</b>	<b>39,774,105</b>	<b>21.39</b>	<b>13.86</b>
<b>Private Development Bank</b>																
Agriculture				1,854,388		1,364,840		177,555		1,125,864		1,245,609		928,008		(6.85)
Fishpond	a/	NA	a/	1,898,225	a/	2,785,540	a/	2,185,598	a/	1,578,729	a/	1,109,885	a/	1,910,755		(12.54)
Non-Agri				1,917,401		1,781,857		1,785,896		1,908,273		1,823,048		1,498,212		(4.08)
<b>Total</b>				<b>5,467,994</b>		<b>5,912,037</b>		<b>4,129,049</b>		<b>4,611,666</b>		<b>3,978,342</b>		<b>4,016,515</b>		<b>(7.84)</b>
<b>Rural Bank</b>																
Agriculture	2,155	3,431,551	2,386	3,440,372	2,558	3,543,592	2,502	3,451,090	2,211	2,212,875	1,805	4,112,885	2,286	3,365,394	(3.48)	3.89
Fishpond	116	506,878	156	851,103	225	1,198,779	268	1,971,246	259	1,499,204	289	1,748,952	219	1,295,327	20.03	28.09
Non-Agri	429	687,142	444	850,048	498	730,581	483	632,214	1,244	932,805	1,405	951,032	751	783,970	28.78	6.72
<b>Total</b>	<b>2,700</b>	<b>4,625,370</b>	<b>2,986</b>	<b>4,941,520</b>	<b>3,281</b>	<b>5,470,952</b>	<b>3,353</b>	<b>6,054,549</b>	<b>3,714</b>	<b>4,644,884</b>	<b>3,499</b>	<b>6,810,869</b>	<b>3,256</b>	<b>5,424,691</b>	<b>5.32</b>	<b>8.05</b>
<b>LBP-FO</b>																
Agriculture	b/								4,842	1,938,774	333	12,910,212	829	2,474,498	(92.83)	566.58
Fishpond											11	289,018	2	48,170		
Non-Agri											4	73,113	1	12,186		
<b>Total</b>									<b>4,842</b>	<b>1,938,774</b>	<b>348</b>	<b>13,272,343</b>	<b>832</b>	<b>2,534,853</b>	<b>(92.50)</b>	<b>585.28</b>
<b>DBP</b>																
Agriculture		4,829,087		3,298,928		3,425,871	902	5,228,741	381	5,015,484	441	4,542,581	287	4,389,745	(30.08)	(8.79)
Fishpond		3,618,778		3,388,889		3,325,195	183	3,829,558	140	3,148,751	187	4,449,431	82	3,593,100	(4.47)	10.72
Non-Agri		1,127,857		1,038,098		175,814	1,062	6,550,053	1,002	6,495,539	478	3,206,368	424	3,098,921	(32.91)	(30.03)
<b>Total</b>		<b>9,575,520</b>		<b>7,723,912</b>		<b>6,926,880</b>	<b>2,147</b>	<b>15,408,352</b>	<b>1,523</b>	<b>14,657,773</b>	<b>1,086</b>	<b>12,198,360</b>	<b>793</b>	<b>11,081,766</b>	<b>(28.88)</b>	<b>(11.02)</b>
<b>ALL BANKS</b>																
Agriculture	2,183	11,738,966	2,414	11,795,825	2,596	14,389,976	3,558	15,886,719	7,275	16,208,348	2,684	31,835,023	3451	18,905,809	4.22	21.93
Fishpond	153	7,891,099	192	8,910,802	296	22,408,553	524	20,654,352	475	14,494,591	550	14,313,302	365	14,745,450	29.16	13.23
Others	751	24,592,183	829	24,026,383	989	26,032,936	2,123	36,098,110	2,894	28,317,170	2,719	47,417,240	1718	31,180,670	29.35	14.03
<b>Total</b>	<b>3,087</b>	<b>44,022,248</b>	<b>10,305</b>	<b>45,333,009</b>	<b>3,881</b>	<b>62,831,465</b>	<b>6,203</b>	<b>72,419,181</b>	<b>10,644</b>	<b>59,020,107</b>	<b>5,953</b>	<b>93,365,565</b>	<b>5534</b>	<b>62,831,929</b>	<b>14.04</b>	<b>18.23</b>

a/ no information given on number of borrowers

b/ LBP-FO in the area was operationalize only in 1990

Table 65  
**RATIONED AND NON-RATIONED BY TYPE OF BORROWER**

TYPE OF BORROWER	RATIONED <sup>a/</sup>		NON-RATIONED		ALL BORROWERS	
	NO.	%	NO.	%	NO.	%
Fishpond Borrower (FLA Holder)	7	35.0	13	65.0	20	100.0
Fishpond Borrower (Non-FLA Holder)	12	8.6	127	91.5	139	100.0
Agricultural Borrower	13	7.8	153	92.7	166	100.0
All Borrowers	32	9.8	293	90.2	325	100.0

a/ Credit rationing refers to quantity rationing where the amount of loan granted is compared to the amount of loan applied for. If the ratio is equal to 1, the borrower is a non-rationed borrower.

-----  
 If less than 1 the borrower is a rationed borrower.

**Table 66**  
**DISTRIBUTION OF SAMPLE BORROWERS AS TO INCOME LEVEL BY TYPE OF BORROWER AND BY TYPE OF BANK**

	Type of Bank																	
	Private Commercial Bank			Private Dev. Bank		Rural Bank			LBP - FO			DBP			ALL BANKS			ALL BANKS
	Type of Borrower			Type of Borrower		Type of Borrower			Type of Borrower			Type of Borrower			Type of Borrower			
	Fishpond Borrower (FLA Holder)	Fishpond Borrower (Non-FLA Holder)	Agricultural Borrower	Fishpond Borrower (Non-FLA Holder)	Agricultural Borrower	Fishpond Borrower (FLA Holder)	Fishpond Borrower (Non-FLA Holder)	Agricultural Borrower	Fishpond Borrower (FLA Holder)	Fishpond Borrower (Non-FLA Holder)	Agricultural Borrower	Fishpond Borrower (FLA Holder)	Fishpond Borrower (Non-FLA Holder)	Agricultural Borrower	Fishpond Borrower (FLA Holder)	Fishpond Borrower (Non-FLA Holder)	Agricultural Borrower	
50,000	-	-	1	1	5	2	4	26	1	-	6	1	-	1	3	5	39	47
50,001 - 100,000	-	1	-	4	4	1	8	23	-	1	-	2	1	4	3	15	31	49
100,001 - 200,000	-	2	1	9	4	3	11	18	-	-	-	-	3	1	4	25	24	53
200,001 - 300,000	-	2	-	2	5	1	10	7	-	-	1	1	4	2	2	18	15	35
300,001 - 500,000	-	2	1	2	1	1	6	2	-	-	1	-	-	-	1	10	5	16
400,001 - 500,000	-	-	2	1	1	-	2	1	-	-	2	-	-	-	1	3	6	10
500,001 - 1,000,000	-	6	2	5	4	1	4	-	-	-	-	1	3	-	2	18	6	26
1,000,000 - 2,000,000	-	5	3	1	1	-	2	-	-	1	-	-	3	-	2	12	6	19
2,000,001 - 3,000,000	-	2	3	-	5	-	1	-	-	1	-	-	1	1	-	5	9	14
3,000,001 - 4,000,000	-	2	-	-	-	-	1	-	-	1	-	1	1	-	1	5	-	8
4,000,001 - 5,000,000	1	-	1	-	-	-	-	-	-	-	1	1	2	1	1	2	3	6
5,000,001 - 10,000,000	-	2	1	-	-	-	1	-	-	-	-	-	2	4	-	5	5	10
10,000,001 - 20,000,000	1	-	1	-	-	-	-	-	-	-	-	-	1	1	-	1	2	3
20,000,000	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	1
ALL	2	24	16	25	30	9	50	77	1	4	11	7	22	17	19	125	151	295 a/
No answer																		

a/ 30 sample borrowers have no answer.

Table 67  
DISTRIBUTION OF SAMPLE BORROWERS BY TYPE OF COLLATERAL OFFERED, BY TYPE OF BORROWER AND BY TYPE OF BANK

TYPE OF COLLATERAL	PRIVATE COMMERCIAL BANK			PRIVATE DEVELOPMENT BANK			RURAL BANK			LSP - FO			DBP			ALL BANKS			TOTAL
	FLA HOLDER	NON FLA HOLDER	AGRI- CULTURAL BORROWER	FLA HOLDER	NON FLA HOLDER	AGRI- CULTURAL BORROWER	FLA HOLDER	NON FLA HOLDER	AGRI- CULTURAL BORROWER	FLA HOLDER	NON FLA HOLDER	AGRI- CULTURAL BORROWER	FLA HOLDER	NON FLA HOLDER	AGRI- CULTURAL BORROWER	FLA HOLDER	NON FLA HOLDER	AGRI- CULTURAL BORROWER	
LAND																			
Cropland	0	2	1	0	2	6	1	0	39	0	0	0	0	3	3	1	13	49	83
Fishpond	1	8	0	0	13	0	3	24	2	0	3	0	2	7	1	6	55	3	64
Commercial	0	3	4	0	1	2	0	4	3	0	0	0	1	3	5	1	11	14	29
Residential	1	10	6	0	10	18	5	16	28	0	1	1	4	9	5	10	48	59	115
Sub-Total	2	23	11	0	26	27	9	30	72	0	4	1	7	22	14	18	125	125	268
CHattel																			
PNTR Produce a/	0	0	3	0	0	0	0	0	1	0	0	6	0	0	0	0	0	10	10
Livestock	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
Vehicle/Equipment	0	4	4	0	9	9	0	0	0	0	0	2	0	1	2	0	14	17	31
Deposits	0	1	1	0	0	0	0	0	0	0	0	2	0	0	4	0	1	7	8
Building	0	0	1	0	3	18	1	4	1	0	2	5	1	2	3	2	13	28	43
Insurance	0	0	0	0	0	0	0	0	0	1	0	3	2	1	0	3	1	3	7
Sub-Total	0	5	9	0	14	27	1	4	3	1	2	16	3	4	11	5	29	66	100

a/ Promissory Note Trust Receipt



Table 68  
RESULTS OF QUANTITY RESPONSE MODEL

VARIABLE	ESTIMATED COEFFICIENT	STANDARD DEVIATION	PROBABILITY
INTERCEPT	- 1.2865	0.786	0.1017
TYPE OF BORROWER <sup>w</sup>	0.7946	0.468	0.0895 *
TYPE OF BANK	0.7435	0.4895	0.3334
MARKET VALUE OF ASSET (PESOS)	$4.38 \times 10^{-8}$	$2.45 \times 10^{-8}$	0.0739 *
SIZE OF FISHPOND (ha)	-0.0331	0.0374	0.3758
SIZE OF CROP LAND	0.00804	0.0131	0.5404
SIZE OF RESIDENTIAL/ COMMERCIAL AREA(m2)	-0.1006	0.2512	0.6889
INTEREST RATE (%)	-10.3977	3.8856	0.0075 ***
APPRAISED VALUE OF CHATTEL (PESOS)	$5.34 \times 10^{-7}$	$2.36 \times 10^{-7}$	0.0242 ***

\*\*\* SIGNIFICANT AT 1%

\*\* SIGNIFICANT AT 5%

\* SIGNIFICANT AT 10%

<sup>w</sup> Credit Rationing by type of Borrower

Frequency Percent	0	1	TOTAL
0	12.00 3.72 40.00 7.27	18.00 5.57 60.00 11.39	30 9.29
1	153.00 47.36 52.23 92.73	140.00 43.34 47.78 88.61	293 90.71
TOTAL	165.00 51.20	158.00 48.80	323 100

**Table 69**  
**DISTRIBUTION OF RATIONED AND NON-RATIONED BORROWERS**  
**BY PURPOSE OF LOAN AND BY TYPE OF BANK**

PURPOSE OF LOAN	TYPE OF BANK											
	PRIVATE COMMERCIAL BANK		PRIVATE DEVELOPMENT BANK		RURAL BANK		LBP-FO		DBP		ALL BANKS	
	RATIONED	NON-RATIONED	RATIONED	NON-RATIONED	RATIONED	NON-RATIONED	RATIONED	NON-RATIONED	RATIONED	NON-RATIONED	RATIONED	NON-RATIONED
Milkfish Pond Improvement/ Development	0	6	0	3	10	28	0	0	0	5	10	42
Farm Development/ Improvement	1	0	0	0	0	8	0	3	1	4	2	15
Prawn Pond Improvement/ Development	0	11	0	9	8	19	0	2	2	10	10	51
Milkfish Working Capital	0	6	0	3	0	15	2	7	0	11	2	42
Prawn Working Capital	1	7	0	16	0	7	0	3	1	15	2	48
Farm Working Capital	4	14	3	29	0	67	3	15	0	14	10	139
ALL	6	44	3	60	18	144	5	30	4	59	36	337 a/
No answer										2		2

a/ A borrower may borrow for a dual purpose.

Table 70  
THE ESTIMATED COBB-DOUGLAS PRODUCTION FUNCTION  
Y = TOTAL PRODUCTION (KILOS)

VARIABLES	ESTIMATED COEFFICIENT	STANDARD ERROR	PROB > T
I. MILKFISH			
INTERCEPT	1.044	1.201	0.3894
Ln LAND (ha)	0.778	0.088	0.0001
Ln LABOR (MANDAYS)	0.172	0.102	0.0980
Ln FRY (PCS.)	0.684	0.111	0.0001
Ln FERTILIZER (PESOS)	0.066	0.101	0.5158
Ln PESTICIDE (PESOS)	-0.078	0.114	0.4975
R-SQUARED = 0.8010			
ADJUSTED R-SQUARED = 0.7794			
F-STAT = 37.039 *			
II. PRAWN			
INTERCEPT	-0.061	1.778	0.9730
Ln LAND (ha)	0.979	0.120	0.0001
Ln LABOR (MANDAYS)	0.169	0.126	0.1908
Ln FINGERLING (PCS.)	0.575	0.147	0.0006
Ln FEEDS (PESOS)	0.314	0.126	0.0194
Ln FERTILIZER (PESOS)	-0.389	0.198	0.0599
Ln PESTICIDE (PESOS)	0.032	0.139	0.8204
Ln LIME (PESOS)	-0.017	0.134	0.9003
R-SQUARED = 83.79			
ADJUSTED R-SQUARED = 0.7959			
F-STAT = 19.943 *			

\* SIGNIFICANT AT THE 0.01 LEVEL

**Table 71**  
**MEAN OF CAPITAL, LAND, LABOR AND OUTPUT**

<b>I. MILKFISH</b>			
	<b>VARIABLE</b>	<b>MEAN</b>	<b>STANDARD DEVIATION</b>
	OUTPUT (KILOS)	9.026 (8,316.56) a/	1.348
	LAND (has)	2.316 (10.135)	1.144
	LABOR (MANDAYS)	3.316 (27.55)	1.176
	FRY (PCS.)	8.110 (3,328)	0.960
	FERTILIZER (PESOS)	7.490 (1790.05)	1.021
	PESTICIDE (PESOS)	5.907 (367.60)	0.888
<b>II. PRAWN</b>			
	<b>VARIABLE</b>	<b>MEAN</b>	<b>STANDARD DEVIATION</b>
	OUTPUT (KILOS)	9.170 (9,604.62)	1.661
	LAND (has)	2.037 (7.67)	1.101
	LABOR (MANDAYS)	3.624 (37.49)	1.462
	FINGERLING (PCS.)	10.634 (41,523)	1.304
	FEEDS (PESOS)	10.338 (30,884.20)	1.378
	FERTILIZER (PESOS)	7.128 (1,246.78)	0.901
	PESTICIDE (PESOS)	7.228 (1,462.64)	1.258
	LIME (PESOS)	7.007 (1,114.34)	1.136

a/ the number in ( ) is the actual value of the mean found by taking the anti-log of the mean value prawn.