Table 2.33 Existing Irrigation Service Areas by Province as of June 1993

Communal Irrigation System	Number of Irrigation System		Total Service Area (Ha)		Type of Irrigation System	Number of Beneficiaries	
	Operational	Non-Operational	Operational	Non-Operational		Operational	Non-Operational
Bataan							
Amortizing	35	1	4,051	15	Pumps	2,026	8
Non-Amortizing	17		1,237		Gravity	619	0
Private	28		1,325		Pump/Gravity	663	0
Bulacan							
Amortizing	5	10	470	750	Gravity	235	375
Non-Amortizing	28	9	3,661	786	Gravity/pump/dam	1,931	393
Private	1	1	35	6	Pump/gravity	15	3
Nueva Ecija							
Amortizing	19	5	6,545	775	Dam/pump	3,273	388
Non-Amortizing	10	2	2,035	115	Gravity/pump/dam	1,018	58
Private	41	8	8,645	1,281	Pump	4,323	641
Pampanga							
Amortizing	28	13	3,278	2,048	Gravity/pump	1,639	1,024
Non-Amortizing	18	38	4,367	7,079	Gravity/pump/dam	2,184	3,539
Private		1		199	Gravity/pump	0	100
Tarlac							
Amortizing	16	11	5,936	578	Gravity	2,968	289
Non-Amortizing	1		623			312	0
Private	19	12	3,284	988	Pump	1,642	494
Zambales							
Amortizing	11	6	1,716	329	Pump	858	165
Non-Amortizing	13	32	1,088	4,219	Gravity/pump	544	2,146
Private	3	12	223	657	Pump	112	329
Total	293	161	48,519	19,825		24,362	9,952

Note : * Beneficiaries with average landholding of 2 hectares
Source: National Irrigation Administration

Table 2.34 National Irrigation Systems Affected by Lahar and Resulting Net Service Area

Name of Province/ System	Service Area (ha)	Area Affected by Lahar (ha)	1992		
			Net Service Area (ha)	Irrigated Area (ha)	
				Dry	Wet
Pampanga					
Colo-Caulaman RIS	877	50	827	541	378
Porac-Gumain RIS	4,486	55	4,431	1,307	530
Tarlac					
Tarlac-San Miguel O'Donnel RIS	13,976	12,400	1,576	447	1,576
Zambales					
Sto. Tomas RIS	3,924	3,177	747	-	-
Bucao RIS	1,231	50	1,181	250	-
Total	24,494	15,732	8,762	2,545	2,484

Source : National Irrigation Administration, Region III

Table 2.35 Irrigated Areas in National Systems, 1988 - 1992

(Unit : hectare)

Name of Irrigation System	Service Area		1988		1989		1990		1991		1992			
	(ha)	(%)	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	(%)	Wet	(%)
Angat-Maasim RIS	31,485	(18.9)	27,728	23,400	27,828	24,821	12,976	25,319	28,345	24,141	27,966	(24.5)	23,880	(19.7)
Porac-Gumain RIS	4,486	(2.7)	3,131	3,996	3,692	4,186	3,675	4,201	3,713	-	1,307	(1.1)	530	(0.4)
Colo-Caulaman RIS	513	(0.3)	907	868	892	1,038	1,027	1,130	1,043	400	541	(0.5)	378	(0.3)
Nayom-Bayto RIS	1,948	(1.2)	799	920	817	956	1,464	1,675	1,602	1,664	1,623	(1.4)	1,628	(1.3)
Tarlac-Sn. Miguel-O'Donnel RIS	13,976	(8.4)	2,465	9,196	2,500	9,868	2,500	9,172	3,864	-	447	(0.4)	1,576	(1.3)
Camiling RIS	8,580	(5.1)	2,550	6,825	2,310	6,984	3,177	6,451	3,060	7,263	2,909	(2.5)	6,965	(5.7)
Bucao RIS	1,231	(0.7)	1,003	683	1,004	-	1,000	-	908	-	250	(0.2)	-	(-)
Nueva Ecija PIS	1,313	(0.8)	674	843	853	605	923	689	759	673	601	(0.5)	323	(0.3)
UPRIIS	103,285	(61.9)	41,794	82,229	66,814	85,211	77,402	84,813	83,701	77,568	78,441	(68.8)	86,058	(70.9)
Total	166,817	(100.0)	81,051	128,960	106,710	133,669	104,144	133,450	126,995	111,709	114,085	(100.0)	121,338	(100.0)

Sources : National Irrigation Administration, Region III; and
Upper Pampanga River Integrated Irrigation System.

Table 2.36 Irrigated Areas in Communal Systems, 1989 - 1993

(Unit : hectare)

Name of Irrigation System	Service Area		1989		1990		1991		1992		1993			
	(ha)	(%)	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	(%)	Wet	(%)
Bataan	6,563	(8.6)	5,166	5,711	4,665	5,915	4,586	5679	4,217	5,668	4,485	(17.7)	5647	(13.4)
Bulacan	5,750	(7.5)	1,364	1,469	1,783	1,895	1,869	1,932	1,932	1,963	1,910	(7.5)	2103	(5.0)
Nueva Ecija	23,221	(30.3)	4,013	17,673	4,429	15,430	5,202	16,251	5,142	15,718	7,150	(28.2)	17418	(41.2)
Pampanga	21,048	(27.5)	1,367	3,718	3,222	5,535	2,841	4,868	6,443	7,612	6,356	(25.1)	7476	(17.7)
Tarlac	11,792	(15.4)	7,834	10,987	7,658	10,311	7,110	8,143	4,314	6,494	4,614	(18.2)	7663	(18.1)
Zambales	8,251	(10.8)	1,304	4,506	1,324	4,241	1,664	1,289	823	1,933	823	(3.2)	1933	(4.6)
Total	76,625	(100.0)	21,048	44,064	23,081	43,327	23,272	38,162	22,871	39,388	25,338	(100.0)	42,240	(100.0)

Source : National Irrigation Administration, Region III

Table 2.37 Credit Assistance Performance of Land Bank of the Philippines

Province	Year						Total
	1988	1989	1990	1991	1992	* 1993	
Amount of Loans Released (Thousand Pesos)							
Bataan			23,317	43,971	50,719	50,937	168,944
Bulacan	17,004	43,463	105,212	248,128	445,734	323,213	1,182,754
Pampanga	11,856	42,641	126,271	183,844	187,904	117,835	670,351
Nueva Ecija	86,876	254,095	416,972	819,274	814,134	543,618	2,934,969
Tarlac	24,533	71,583	159,096	261,794	174,054	133,287	824,347
Zambales			15,675	25,953	29,367	14,907	85,902
Total	140,269	411,782	846,543	1,582,964	1,701,912	1,183,797	5,867,267
Number of Small Farmers/Fishermen Assisted							
Bataan			1,509	1,614	3,786	5,996	12,905
Bulacan	1,584	4,162	6,044	9,304	21,145	1,504	43,743
Pampanga	1,415	3,369	6,407	15,569	15,251	11,240	53,251
Nueva Ecija	11,811	32,929	32,311	58,308	62,889	32,395	230,643
Tarlac	2,991	8,792	17,348	29,078	28,866	10,970	98,045
Zambales			2,161	2,783	1,745	1,154	7,843
Total	17,801	49,252	65,780	116,656	133,682	63,259	446,430
Number of Cooperatives Assisted							
Bataan			11	40	41	71	163
Bulacan	10	45	106	196	227	21	605
Pampanga	13	17	70	131	118	151	500
Nueva Ecija	46	157	308	487	418	339	1,755
Tarlac	27	54	119	232	205	141	778
Zambales			47	61	51	31	190
Total	96	273	661	1,147	1,060	754	3,991

Note : * January to October 1993

Source: Field Services Department, Land Bank of the Philippines,

Table 2.38 Total Guarantee Program Assistance Generated by Quedancor : As of August 31, 1993

Provinces	A/M		FARE	LAMP	Total
	Grain Stocks	Farmer Groups			
Bataan					
Loan Guaranteed (Million Pesos)	19,952	-	-	-	19,952
No. of Borrowers	7	-	-	-	7
Est. No. of Farmer- Ben.	1,981	-	-	-	1,981
Bulacan					
Loan Releases (P M)	333,358	-	6,335	-	339,693
No. of Borrowers	52	-	289	-	341
Est. No. of Farmer- Ben.	35,452	-	471	-	35,923
Pampanga					
Loan Releases (P M)	84,782	11,252	50,297	-	146,331
No. of Borrowers	19	2	1,408	-	1,429
Est. No. of Farmer- Ben.	12,083	2,200	2,538	-	16,821
Nueva Ecija (North)					
Loan Releases (P M)	361,205	12,441	39,120	-	412,766
No. of Borrowers	52	5	972	-	1,029
Est. No. of Farmer- Ben.	90,838	1,832	2,047	-	94,717
Nueva Ecija (South)					
Loan Releases (P M)	401,225	2,091	13,996	-	417,312
No. of Borrowers	60	2	230	-	292
Est. No. of Farmer- Ben.	47,336	8,682	524	-	56,542
Tarlac					
Loan Releases (P M)	979,785	7,033	23,802	0.150	1,010,620.1
No. of Borrowers	35	2	490	1	528
Est. No. of Farmer- Ben.	130,804	1,194	852	1	132,851

Notes : A/M = Agri-aqua Inventory Management
FARE = Food & Agricultural Retail Enterprises
LAMP = Livelihood and Aqua Marine Productivity
Source : Quedancor

Table 2.39 PCIC Crop and Livestock Insurance Production in Central Luzon

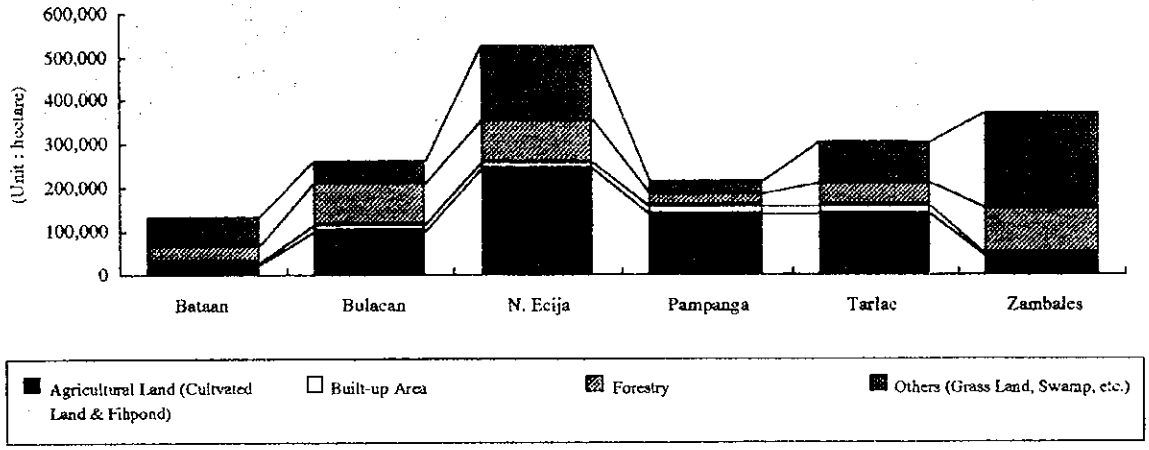
Year	Rice			Corn			Livestock	
	Farmers	Area	Amount Covered (PM)	Farmers	Area	Amount Covered (PM)	Farmers	Amount Covered (PM)
1992	62,590	121,095	772.24	301	420	2.82	6,233	122.32
1991	99,674	190,707	1119.64	920	1,337	7.96	1,806	25.21
1990	72,189	136,368	659.75	581	901	5.26	714	5.78
1989	70,797	129,787	468.76	359	470	2.74	352	3.25
1988	39,653	73,779	266.56	98	126	0.76	183	0.99
1987	26,476	55,024	195.77	104	166	0.88		
1986	26,235	58,504	210.12	215	457	2.44		
1985	35,066	78,257	230.34	781	1,827	10.24		
1984	18,028	39,802	104.01	515	862	3.21		
1983	28,672	64,508	100.47	519	974	2.14		
1982	27,204	63,072	911.23	99	141	0.32		
1981	20,857	47,265	67.16					

Source: Philippine Crop Insurance Corporation (PCIC)

CHAPTER 2

FIGURES

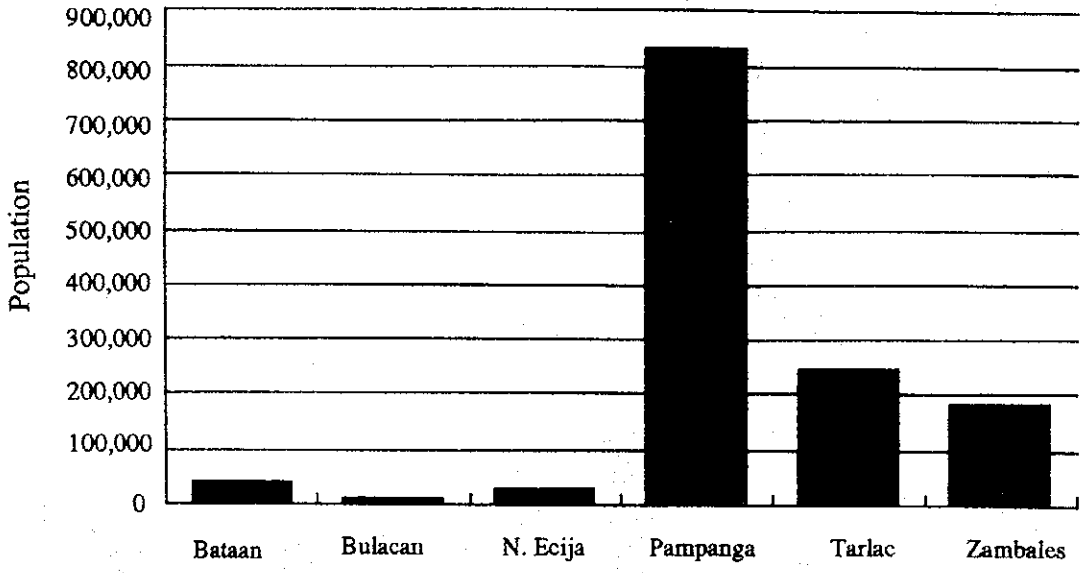
Figure 2.1 Present Land Use in Central Luzon



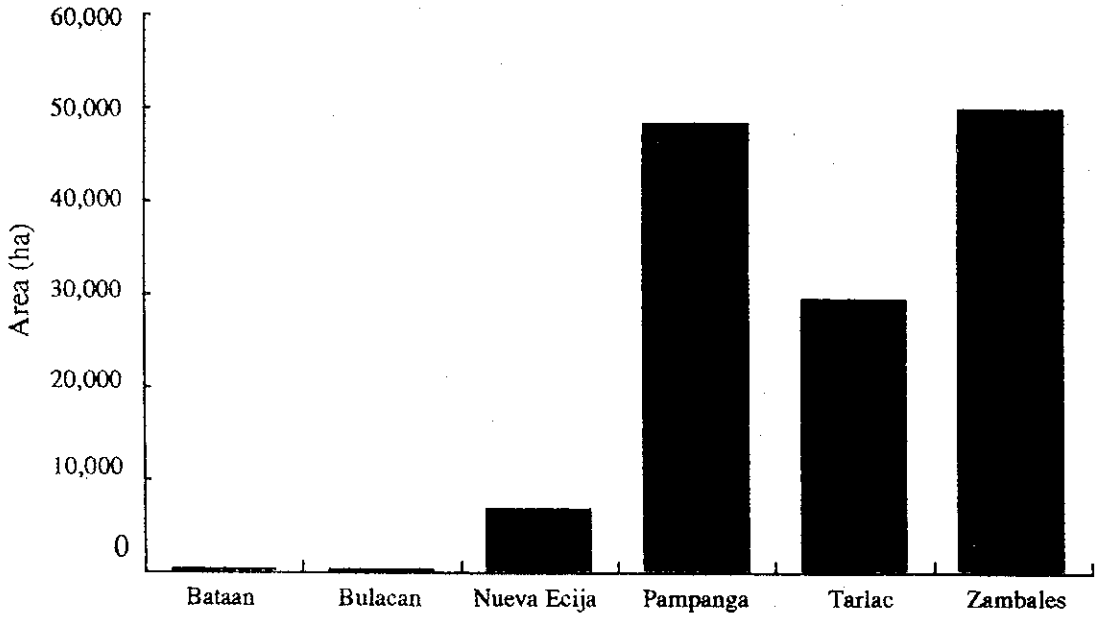
Source : Bureau of Soils and Water Management (BSWM)

Figure 2.2 Population and Areas Affected by Mt. Pinatubo Eruption

(1) Population Affected

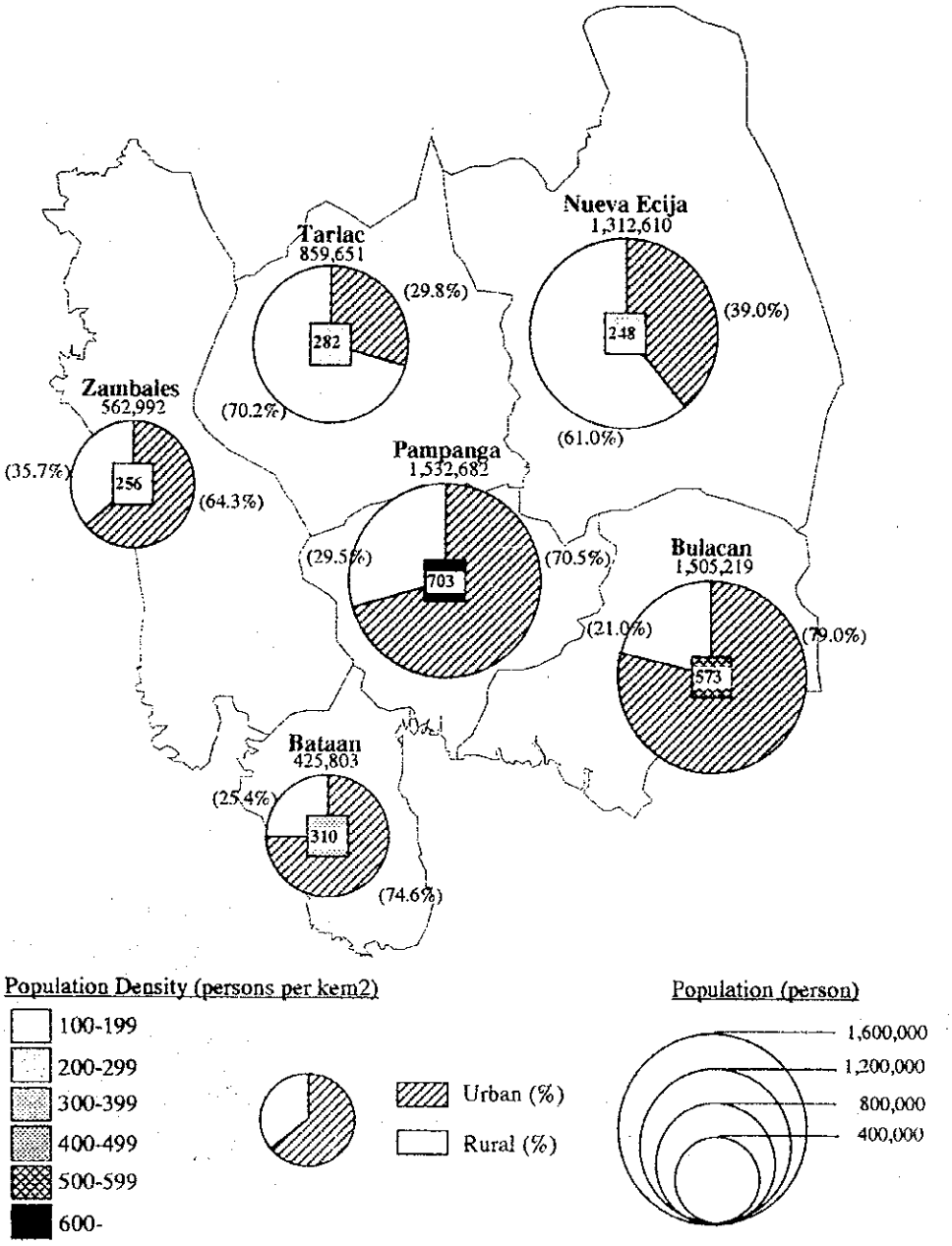


(2) Area Affected



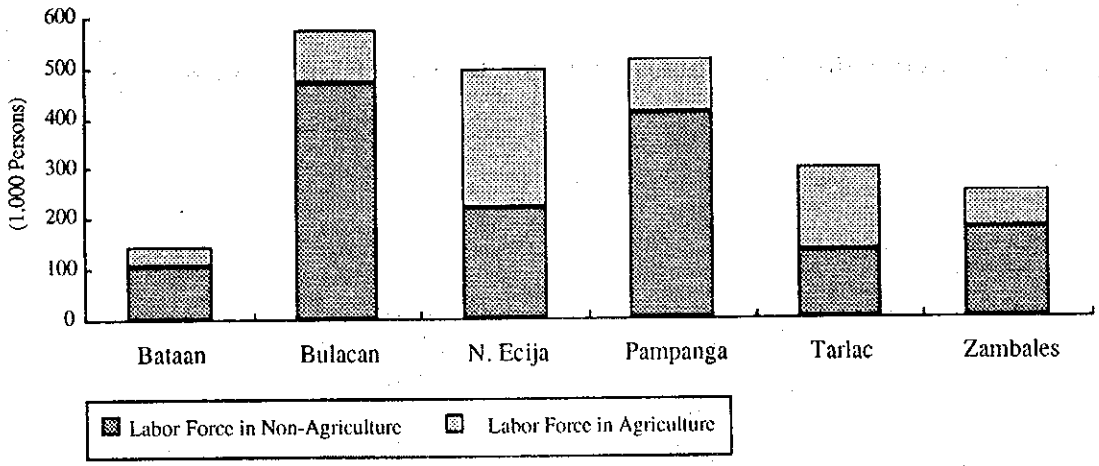
Source : NEDA Region III Office;
NRO-3 GIS Database and Pinatubo Lahar Hazard Map; and
Population data from NSO 1990 Census.

Figure 2.3 Population by Urban-Rural and Its Density in Central Luzon



Source : National Statistics Office

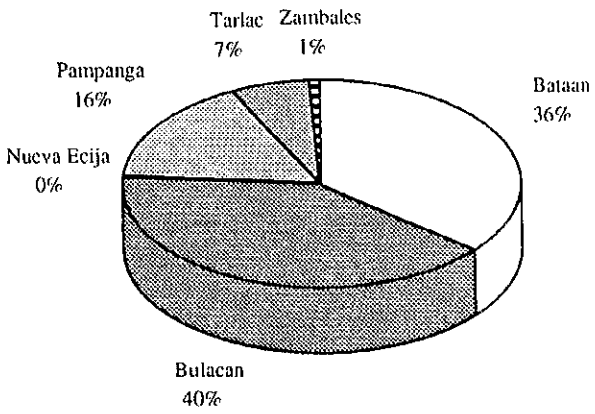
Figure 2.4 Employment in Agricultural Sector in Region III



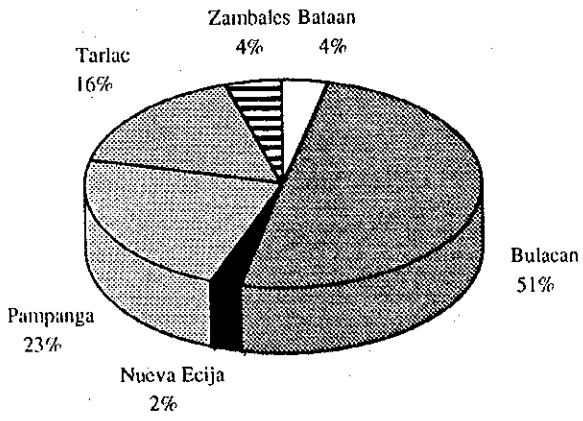
Source : National Statistics Office

Figure 2. 5 BOI Investments and Employment Generation , 1988-1991

(1) Total Investment Amount (P1 Million)

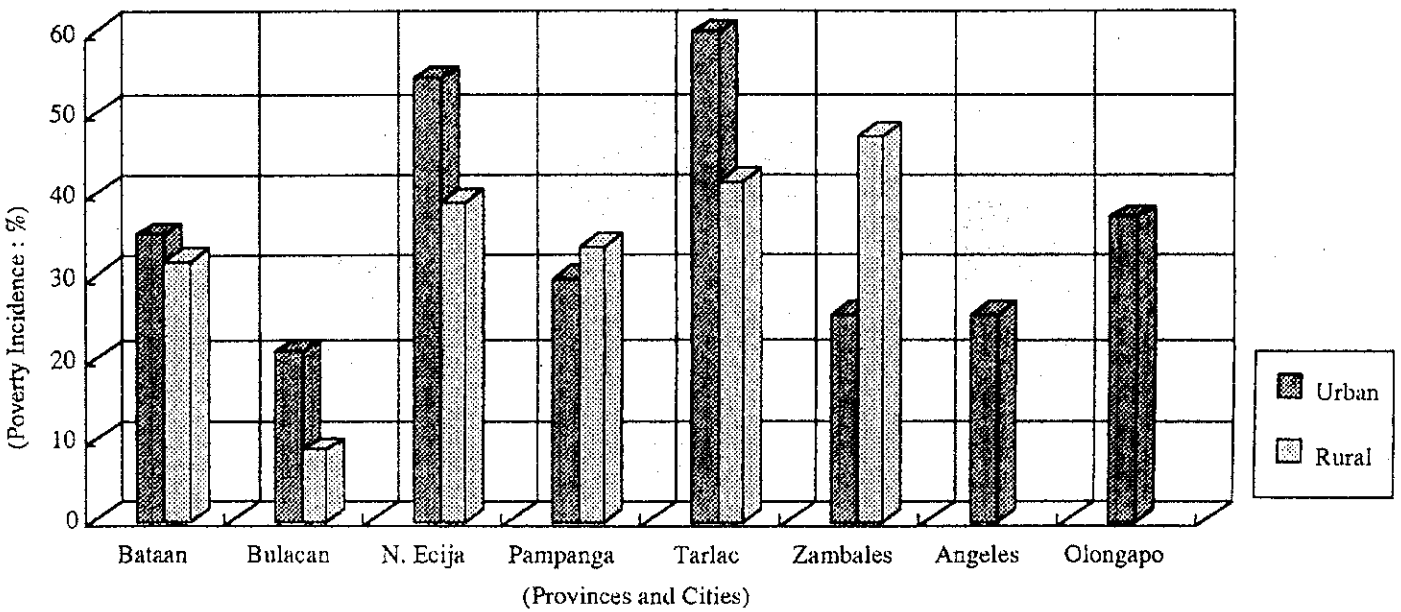


(2) No. of Generated Employment



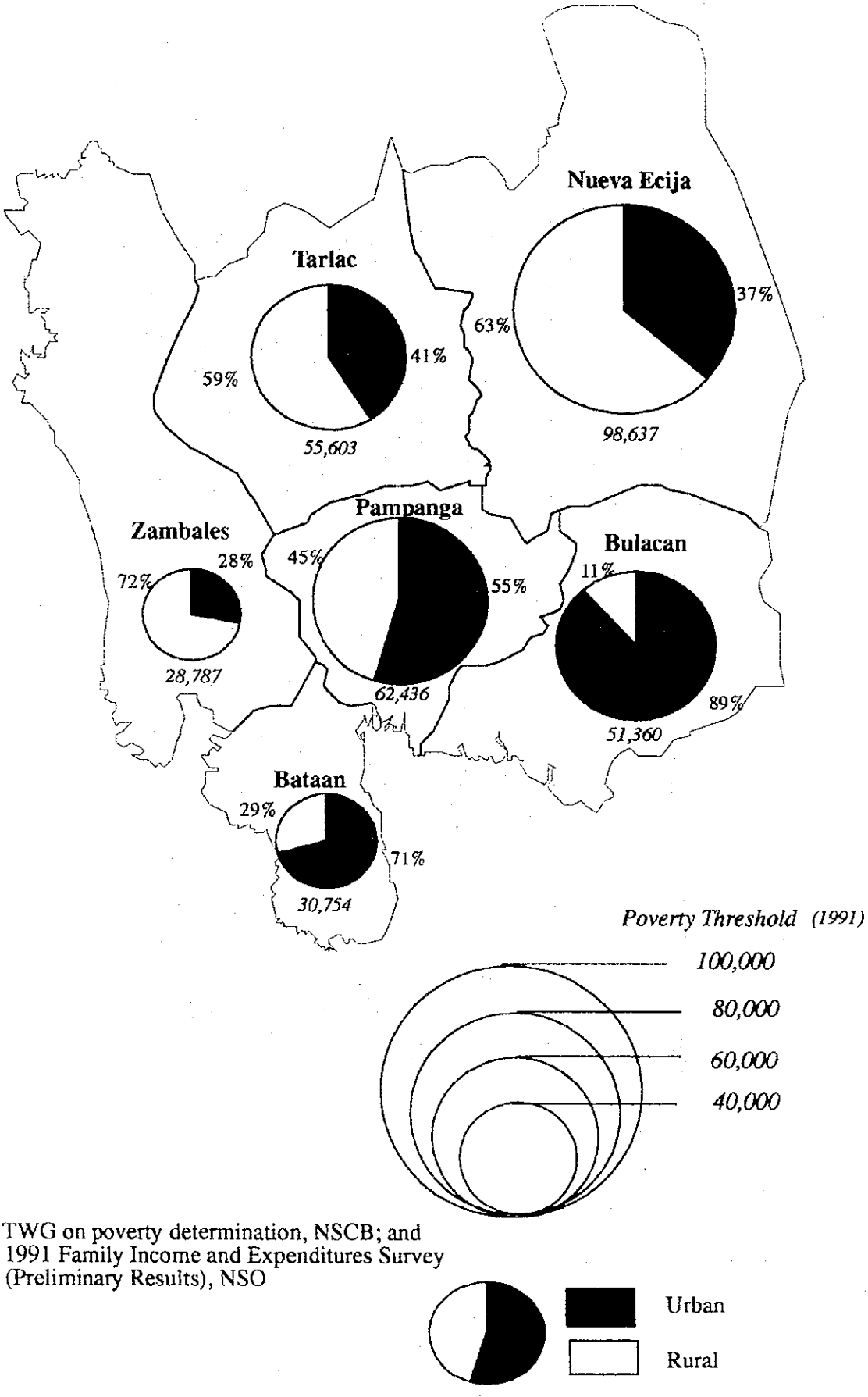
Source : Department of Trade and Industry, Region III

Figure 2.6 Poverty Incidence in Urban and Rural, 1991



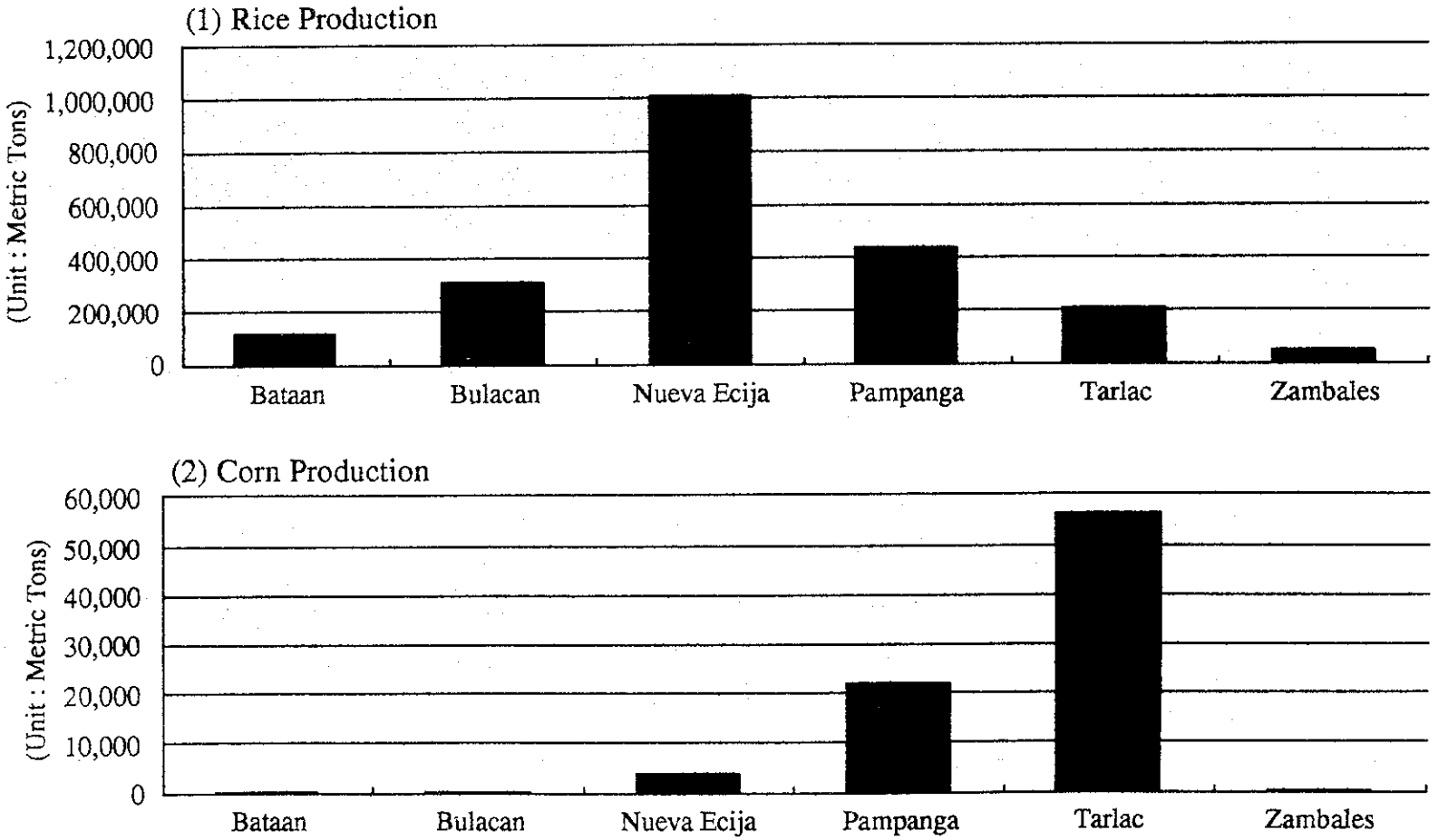
Sources : TWG on poverty determination, NSCB; and 1991 Family Income and Expenditures Survey (Preliminary Results), NSO

Figure 2.7 Poverty Threshold in Urban - Rural, 1991



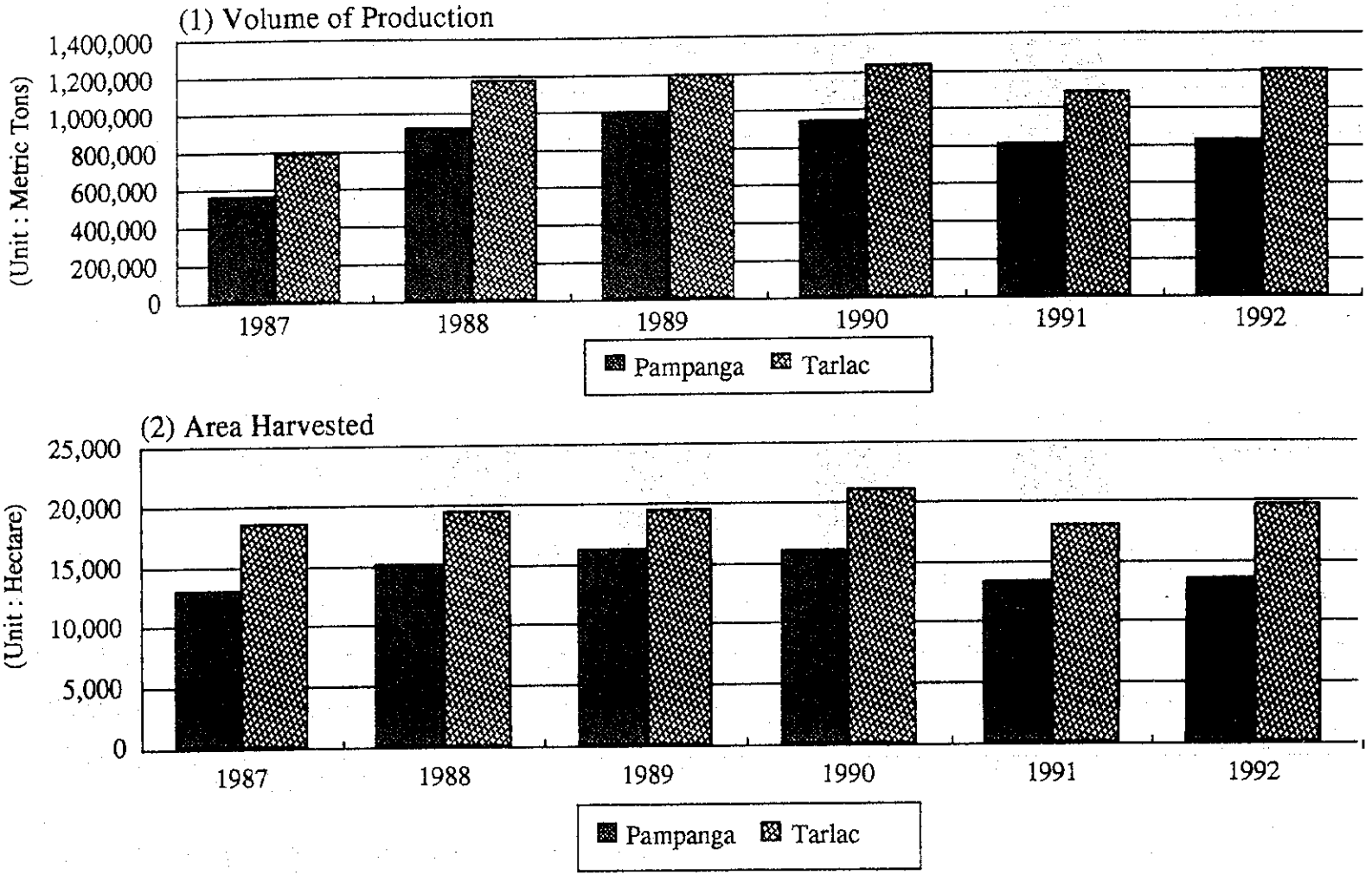
Sources : TWG on poverty determination, NSCB; and
1991 Family Income and Expenditures Survey
(Preliminary Results), NSO

Figure 2.8 Rice and Corn Production by Province, 1992



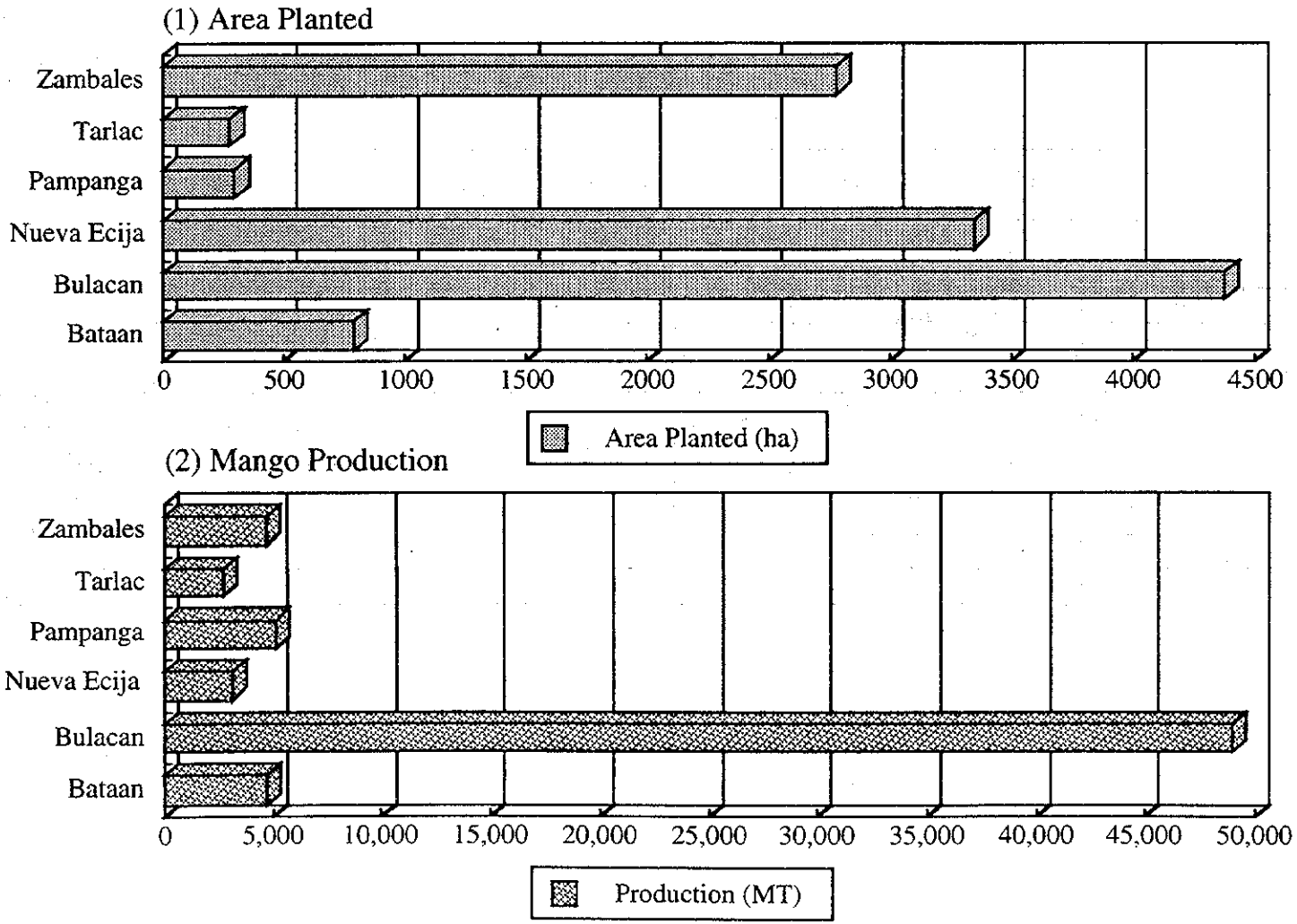
Source : Bureau of Agricultural Statistics, Department of Agriculture

Figure 2.9 Sugarcane Production and Area Harvested in Central Luzon, 1987-1992



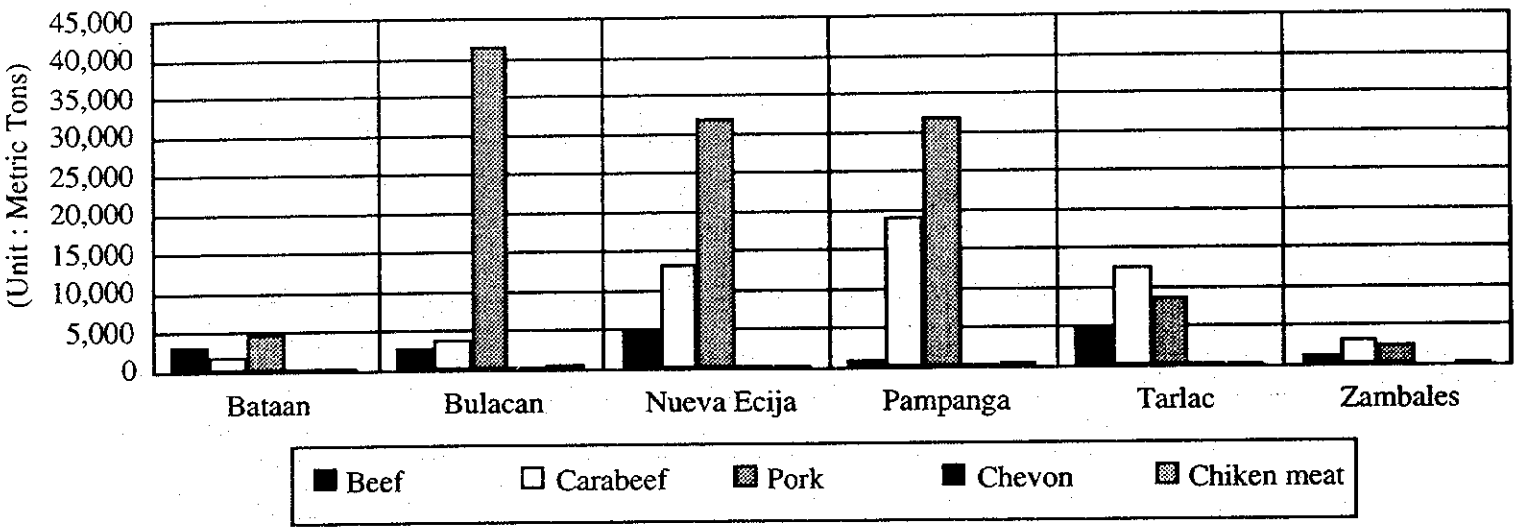
Source : Bureau of Agricultural Statistics, Department of Agriculture

Figure 2.10 Area Planted and Production of Mango, 1992



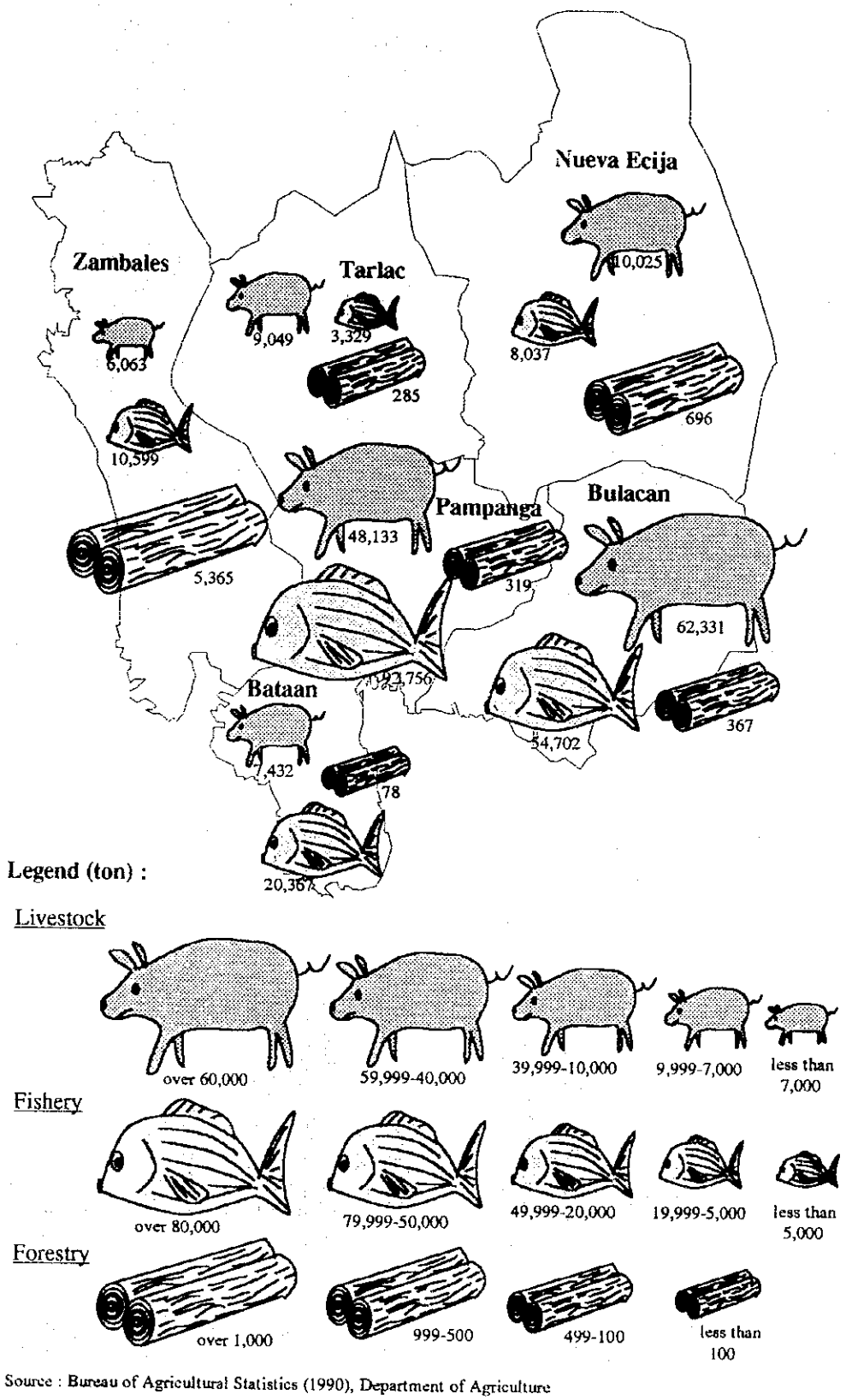
Source : Bureau of Agricultural Ststistics, Department of Agriculture

Figure 2.11 Meat Production by Commodity and by Province, 1992



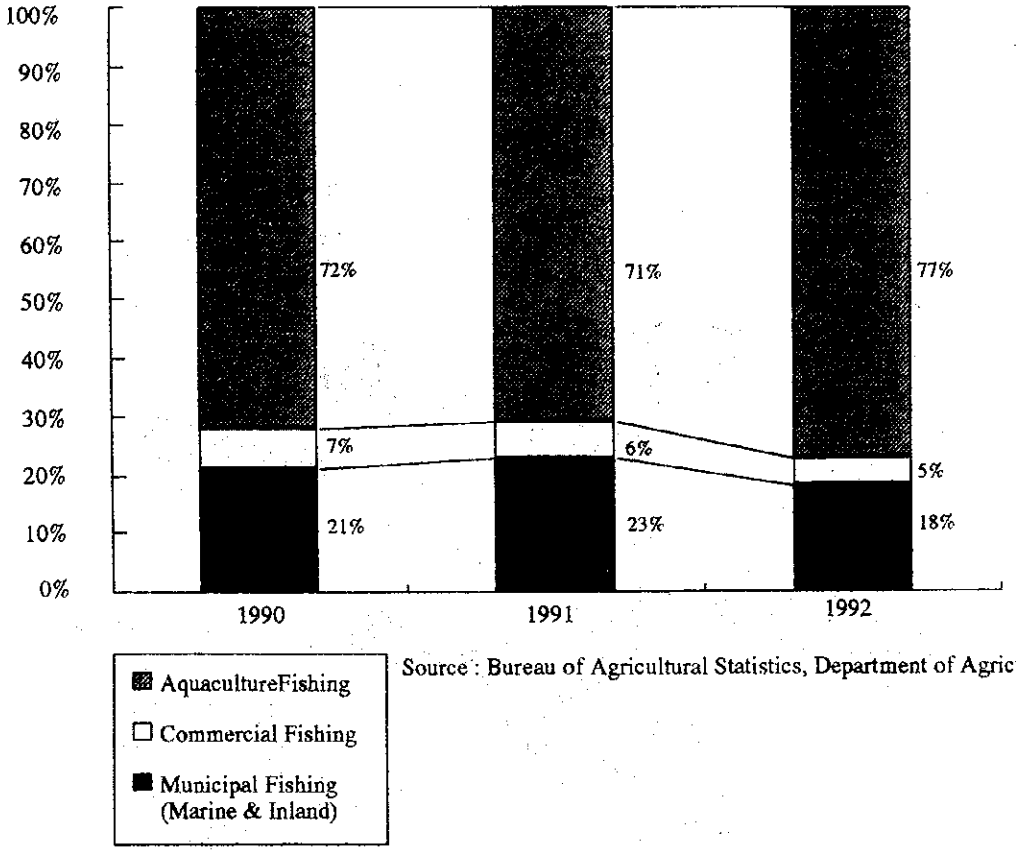
Source : Bureau of Agricultural Statistics, Department of Agriculture

Figure 2.12 Livestock, Fishery and Forestry Productions in Central Luzon



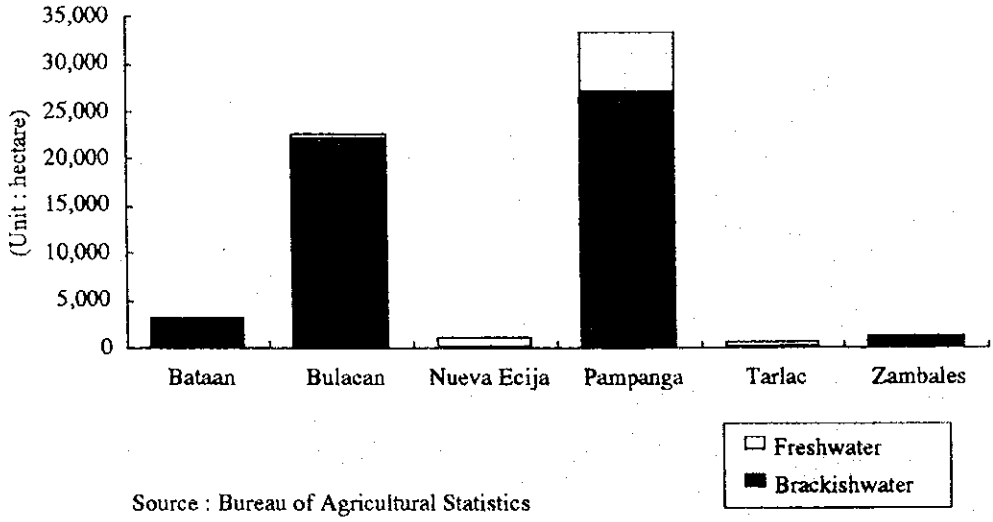
Source : Bureau of Agricultural Statistics (1990), Department of Agriculture

Figure 2.13 Fish Productions in Central Luzon, 1990 - 1992



Source : Bureau of Agricultural Statistics, Department of Agriculture

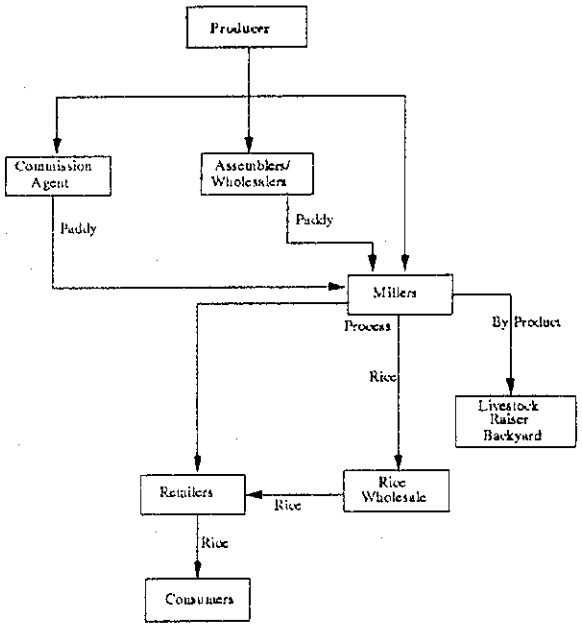
Figure 2.14 Fishpond Areas by Province, 1991



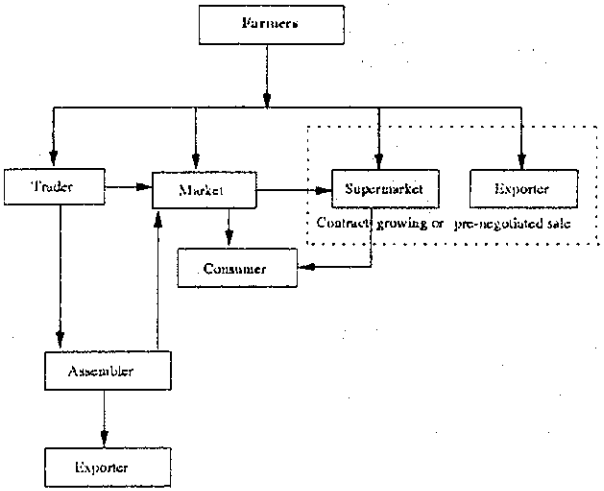
Source : Bureau of Agricultural Statistics

Fig. 2.15 Flow of Agricultural Commodities

(1) Rice Commodities

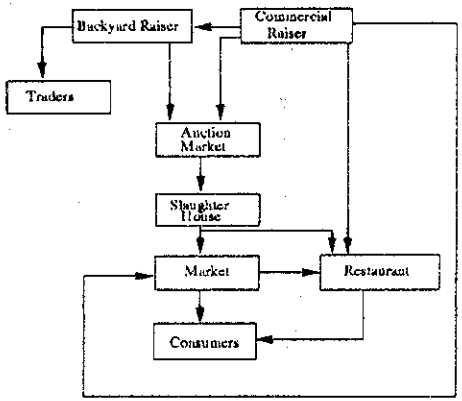


(2) Vegetable and Fruit Commodities



(3) Livestock Commodities

A. Cattle and Carabao



B. Swine and Poultry

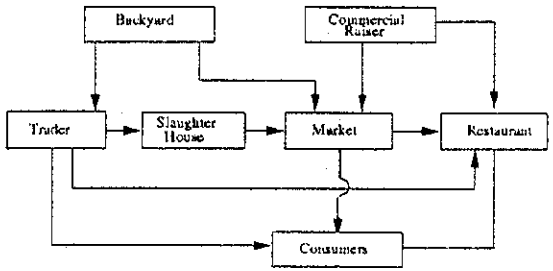
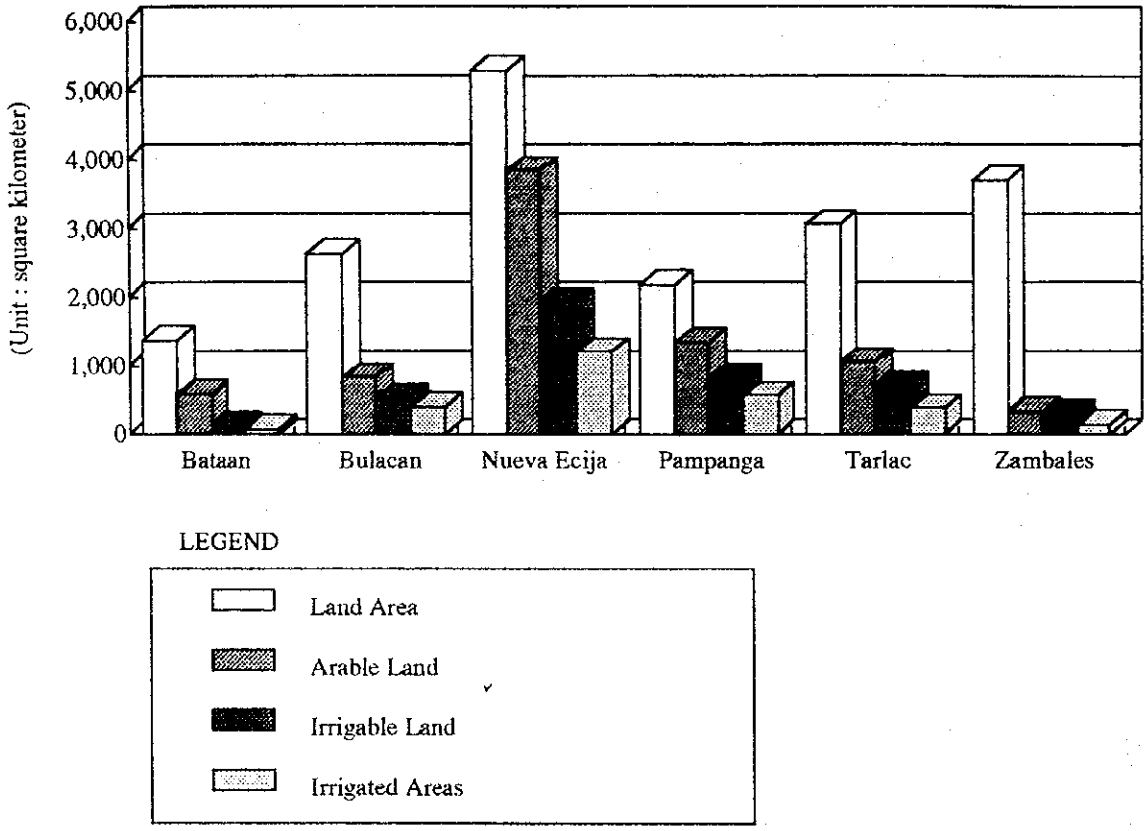
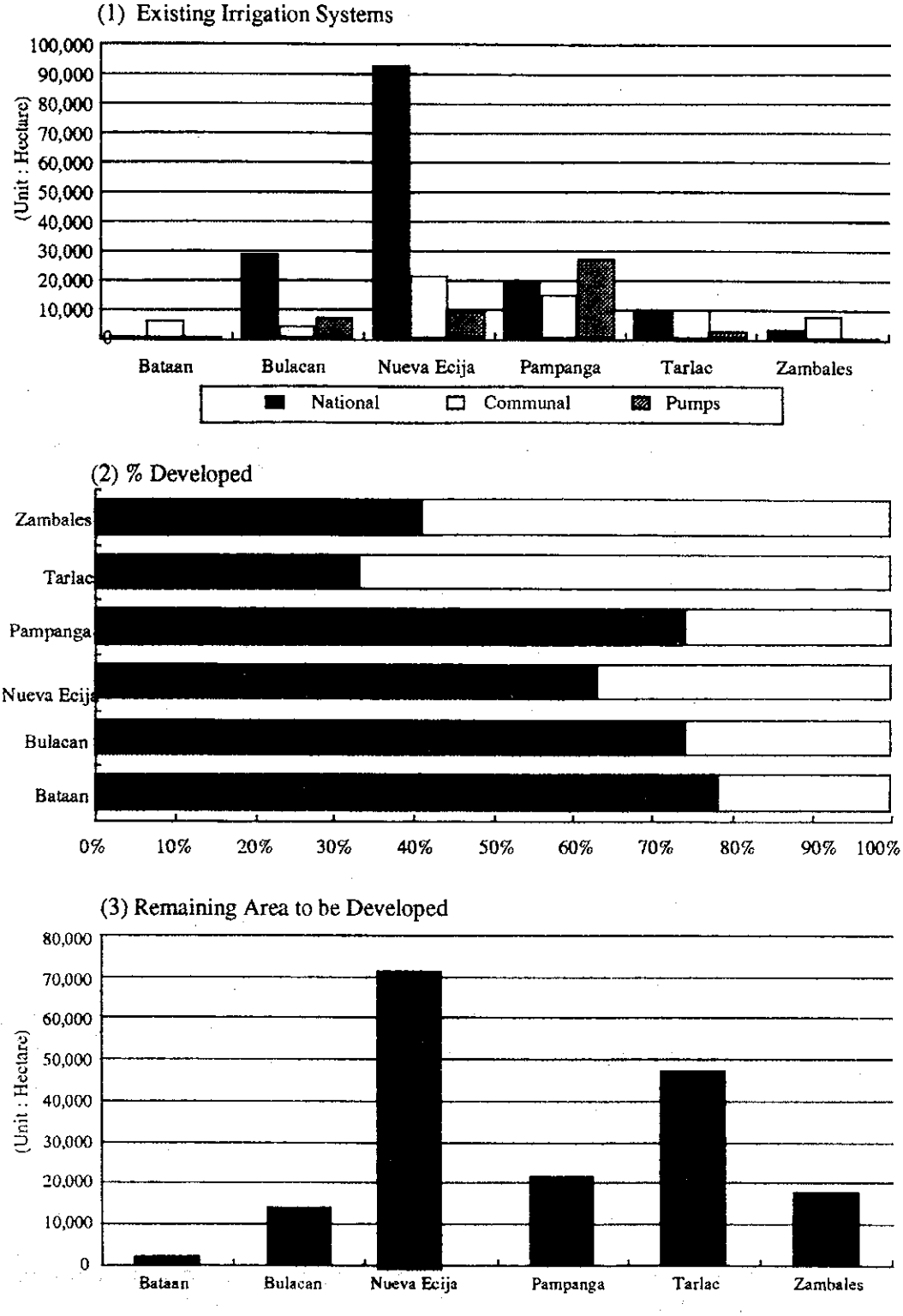


Figure 2.16 Irrigation Potentials and Development Situations, 1990



Source: National Irrigation Administration, Region III, 1993

Figure 2.17 Inventory of Existing Irrigation Systems, 1992



Source : National Irrigation Administration (NIA)

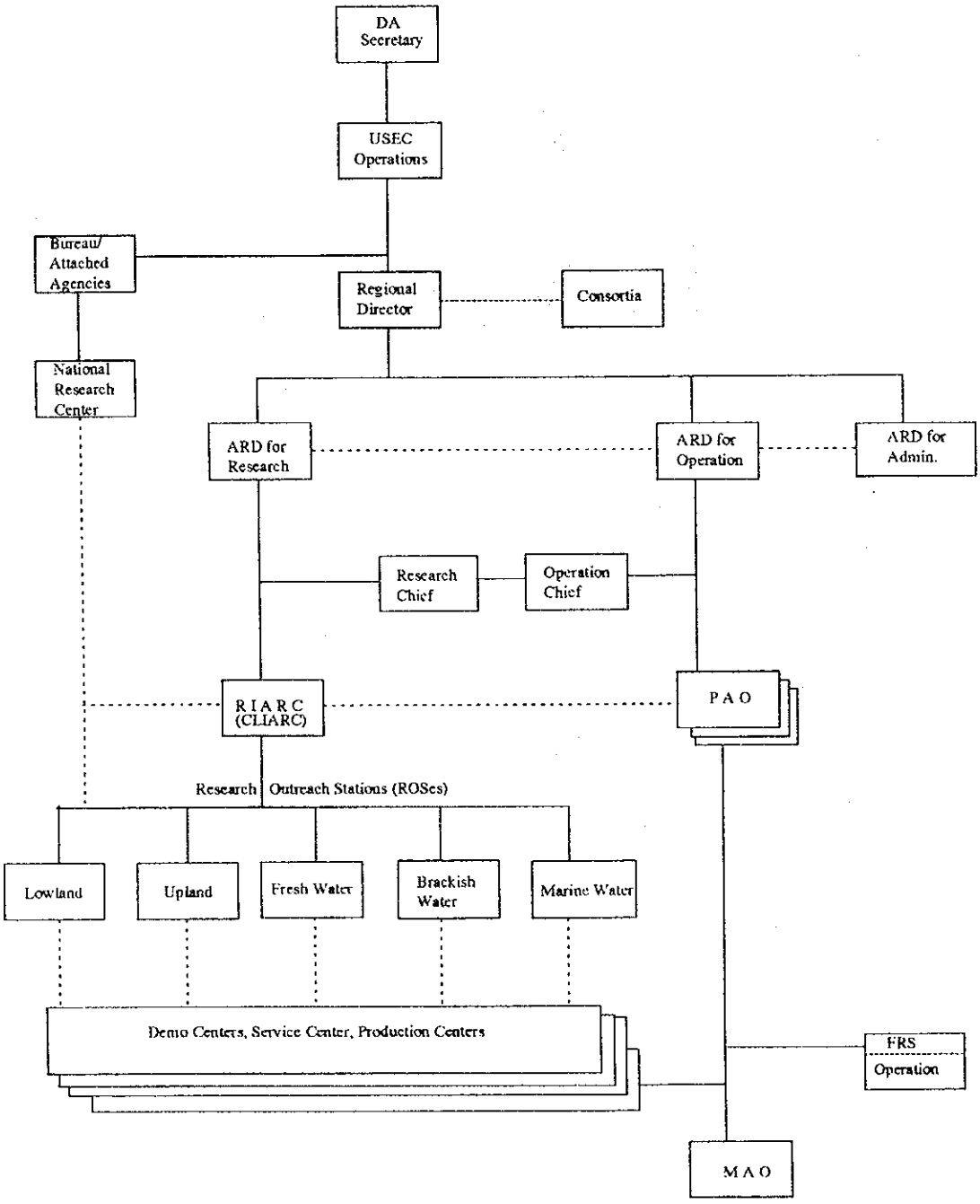


Figure 2.18 Research and Extension Organizational Structure of the Department of Agriculture

CHAPTER 3

CHAPTER 3 CONSTRAINTS AND RECENT DEVELOPMENT UNDERTAKINGS

Called a "granary" or "food basket" of the Philippines, the Central Luzon has in general a comparative advantage for agricultural production in the Country. This chapter examines constraints to rural and agricultural development, reviews recent development undertakings, and presents some issues for rural and agricultural development in Central Luzon.

3.1 Constraints to Rural and Agricultural Development

3.1.1 General

Table 3.1 summarizes constraints/problems and potentials/opportunities in each sub-sector for agricultural development in Central Luzon. The problem structure of Central Luzon is illustrated in Figure 3.1 centering around agriculture. Fundamental constraints limiting the growth of all agricultural activities might be due to the following :

(1) Natural disasters such as earthquake, eruptions of Mt. Pinatubo, typhoons, floods, and droughts,
(2) Environmental degradation,
(3) Insufficient infrastructure,
(4) Policy of food security, and
(5) Skewed land distribution and ownership.

In addition to these, specific constraints to development in each sub-sector could be summarized as follows.

1) Food crop production
   - Inadequate management of irrigation systems, and
   - Insufficient research and extension.

2) Plantation crops
   - Impacts of the Comprehensive Agrarian Reform Program (CARP) such as segmentation of large scale plantations into individually owned lots,
   - International commodity markets which are subject to wide price fluctuations, and
   - Insufficient diversification technologies.

3) Livestock sub-sector
   - Small-scale backyard operations as a result of lack of funds and technologies, and

- Loss in competitiveness due to an overvalued exchange rate for securing animal feeds.

4) Forestry sub-sector
   - Resource depletion due to widespread logging,
   - Weak government law enforcement,
   - Development of upland farming and agro-forestry due to population pressures and increase of the outmoded and unsustainable agricultural practices like slash-and-burn agriculture,
   - Environmental degradation, especially loss of forests in upstream areas of watersheds causing losses in soil fertility, landslides, downstream siltation, flooding, lowering of water tables, etc.,
   - Inadequate technical and financial supports and services due to its isolated locations, and
   - Lack of security of tenure for agro-forestry development in uplands.

5) Fisheries sub-sector
   - Competition and conflicts between small-scale (municipal) and commercial-scale fishermen for declining fisheries resources,
   - Resource degradation due to destructive harvesting methods (ex. blast fishing),
   - Inadequate enforcement of law,
   - Siltation and pollution due to deforestation in upland areas,
   - Poor post-harvest infrastructure, and
   - Tariff and trade disincentives.

3.1.2 Physical constraints

The eruption of Mt. Pinatubo rendered 13,591 ha of agricultural lands useless (Table 2.5). These areas include paddy fields that may not be cultivated for some time. With the present volcano activity, uncertainty of agricultural lands that will be affected or worst devastated is still indeterminate. Although Central Luzon had not been frequented by disastrous typhoons for several years, it was hit by major typhoons in 1993.

Contrary to the common perception that the region consists of vast fertile agricultural lands, it actually consists of an extensive land area where water and soil management practices should be applied more unsparingly. Paddy production performance is a clear indicator of these infertile lands. In most cases, irrigated paddies are also well supplied with fertilizer, hence higher yields. Low yields are also observed in some years and provinces due to low application of fertilizer. In rainfed areas, fertilizer application is generally very minimal

particularly in upland areas. Thus, the level of production is affected mainly by availability of water for crops and level of fertilizer application.

Even before the Mt. Pinatubo eruption, the region had been suffering from degradation in its environment due to misuse and neglect. The region's forest cover of 12.5% is far below the ideal 40:60 ratio of forest land versus alienable and disposable lands. Deforestation continues to average 7,045 ha annually from 1987 to 1991 and its rate of replenishment does not catch up.

In 1990, 270 km^2 of forests are reported under kaingin (slash and burn cultivation) and 2,707 km^2 were destroyed by forest fire (Table 3.2 and Figure 3.2). Consequential erosion occurrences follow causing siltation and sedimentation in rivers and irrigation systems, thus insufficient water contained in reservoirs and delivered to paddy fields.

Exploitation of the region's forest resources demands more effort toward rehabilitation, protection and conservation. However, illegal loggings continue despite the total "log ban" due to the pressures exerted by the expanding demand for residential, commercial and/or industrial uses. Illegal encroachment of settlers in the upland has also persisted.

3.1.3 Socio-economic and institutional constraints

Poverty has been a chronic constraint in the development of agriculture sector. Low income and production have caused a vicious cycle aggravating poverty. Farmers are discriminate in the acquisition of optimum farm inputs due to low income, thus the low level of fertilizer application and use of non-certified seeds.

As estimated by the Bureau of Agricultural Statistics (BAS), only about 80% of the irrigated and 60% of the rainfed paddies utilize fertilizer. More important, although it has been increasing over time, the level of fertilizer use is still less than one half of the generally recommended usage of 90-30-30 (N-P-K). This low level of application can be explained partly by lack of financial incentives.

Likewise, only about half of rice farmers use good quality seed. About 13.5% of rice farmers use certified seed while 45% use mixed seed. This low level of use of good quality seed has been, to a great extent, the result of inadequate extension efforts to promote the use of certified seed, the unavailability of seed at the right time and place, the unacceptability of seed over time and the lack of credibility of the seed certification process.

The development of the agriculture sector requires financing. Credit facilitates the use of more efficient levels of inputs in production, the construction and upgrading of post-harvest

facilities and efficient participation of more traders. However, government budgeting policy is discriminate to rural areas. Credit is limited and so is financing for rural infrastructure.

Despite the high percentage of irrigation development in the region (59.1%), many irrigation service areas are not actually served partly due to inefficient facilities. The ratio of irrigated area to service area for the last five years (1988 to 1992) is about 58% and 67% for dry and wet seasons, respectively (Table 3.3). Moreover, irrigation facilities in some areas are wanting. Rainfed areas still cover a large portion of paddy production (Table 3.4). Farm-to-market roads are mostly unpaved and are usually impassable during rainy seasons.

Constraints on credit

A very small percentage of credit need is satisfied by both the formal and informal sectors. Credit facilities provided under different programs are very limited and negligible compared to the total credit need of the rural and agricultural sector.

While the Government is moving out from provision of cheap credit, its programs related to increasing the bankability of small farmers have not yet taken a leap in this endeavor. Guarantee programs which are supposedly intended to help small farmers borrow capital are misdirected. For example, quedan guarantee programs cater largely to traders of agricultural products instead of small farmers.

The crop insurance program is more likely operating to protect lenders rather than producers. In the insurance portfolio of PCIC, about 98% are borrowers and only about 2% are non-borrowers. While it is true that crop insurance would encourage shift of credit to the agriculture sector, there is also an existing bias against farmers who finance farming operations on their own (or non-borrowing).

These farmers do not obtain protection for their investments. This inclination had been caused by two major reasons. First, PCIC (with its limited operating fund) is pressured to prioritize borrowers because crop insurance acts as credit guarantee. Second, it was observed that (by proportion) there had been more damages claimed in the non-borrowing category than in the borrowing. Thus, catering to the non-borrowing farmers does not put the agency on the leverage as a corporate organization.

Constraint on research and extension

During 1988-1992, the Government's appropriation for agricultural research was a dismal 0.2% of the Country's gross value added (GVA) in agriculture which is low by international standards. Japan allocated 3.34% of its GVA in agricultural research during 1978-1980. Other developing countries in Asia spent 0.3 - 0.8% of their GVA on R & D . It appears that the Philippines is spending less than the average for Southern Asia. The World Bank recommends an expenditure of 1.0% of GVA for developing countries.

Marketing of agricultural products which definitely influence farmers' income are hampered by two main factors : lack of information and post-harvest facilities. It appears that market information of BAS hardly benefits farmers due to untimely dissemination. More often, farmers are captured to low prices for lack of market alternatives.

Market information is almost nil due to the absence of or inadequate communication and inefficient transport services. These services are essential for facilitating the movement of agricultural outputs and inputs, reducing post-harvest losses, stabilizing prices and integrating the agricultural sector with the rest of the economy. These would also promote private sector investments in post-harvest trading and credit services. In addition, there are no trading centers for non-grain crops such as fruits and vegetables.

Agriculture remains a significant portion of the region's economy in spite of the rapid industrialization. Harnessing its full potentials has been hampered by the gross inadequacy of its post-harvest facilities and marketing systems. Existing warehouses can absorb only 18% of the total palay production and the rice milling capacities can process only 8% of the total rice consumption in the region. Substantially addressing the post-harvest inadequacy would certainly mean higher value added in rice production.

3.1.4 Policies for development

In relation to the rural and agricultural development, an area which is ambiguous and needs clarification is government policy on agro-industry and financial support to that particular industry or sector. Based on the Medium-Term Philippine Development Plan (MTPDP) or the "Philippines 2000" advocated by the present administration, every government agency has adopted the people-oriented and/or community-based approach for regional and rural development and is trying to select/promote priority industries and/or sectors which they want to strengthen and support.

These efforts themselves are valuable and necessary to economic development planning. What seems to be lacking, however, is the presentation of concrete, well-established policy of the national government as a whole on its rural and agricultural policy. There may be a need for more complete, comprehensive picture of rural and agricultural policy with clear definition of roles of each government agency. The same can be true to industry policy including agro-industry, policy for poverty alleviation or rural development.

3.1.5 Institutional problems

The implementation of the 1991 LGC has adversely affected the implementation of government programs in many ways. The lack of data and information needed for a more intelligible planning and decision making relative to the provision of the required

infrastructure facilities and services is a major concern. There is still no regional system of documenting and monitoring changes in the inventory level of facilities on a regular basis.

As institutional constraints, the following problems / inconveniences are pointed out in the Philippines.

- Unclear demarcation of roles among the government agencies involved in the rural and agricultural development,
- Inefficiency in development planning and management, especially in resource allocation due to absence of a central unit or body which coordinates all the development finance activities, and
- Overlapping areas of activities among the government agencies as a result of overlapped responsibilities of each institution.

As for the financial loans and credits in the Philippines, they are primarily provided by the government financial institutions (GFIs) such as the Development Bank of the Philippines (DBP), Land Bank of the Philippines (LBP), etc. and partly by private ones. In such provision of financial loans, it is also indicated that overlapping of responsibilities of each institution is causing inefficiency in resource allocation.

Accordingly, the institutional constraints mentioned above do not seem to be specific problems in the government organizational structure of the Philippines. Similar overlapping of roles / responsibilities can be observed everywhere not only among government agencies but also even within the same institution, although there are certain differentiation in their goals and policies (ex. in the relations between DBP-LBP, TLRC-LIVECOR, NIA-BSWM, NPC-NEA and so forth).

What is more confusing is the relation between the government line agencies and the ad hoc authorities newly established under the Office of the President. To ensure the more efficient and effective use of the limited resource within the Government, it is desirable to reduce and streamline overlapping areas of responsibilities and activities or to designate a central body which coordinates overall institutional development system.

3.2 Recent Development Undertakings

3.2.1 Policy directions

Research and extension services

The last reorganization in the Department of Agriculture and the implementation of the 1991 Local Government Code created some setback in the delivery of agriculture related services.

Agricultural technicians became generalists in the field after the reorganization. Following the implementation of the 1991 LGC, the supervision for these technicians were later transferred to local governments. These recent developments in the bureaucracy intended to maximize expertises and expedite the delivery of extension services. These intentions will not turn into realities without re-direction in policies. In this regard, the primary concern of Bureau of Agricultural Research R&D are to develop agricultural technologies and to establish working linkages between research and extension. The Government through DA shall support the proliferation of site specific researchers by strengthening the capability of field research stations devolved to LGUs and local technicians.

Credit

Philippine policies on rural finance in the past two decades were characterized mainly by the liberal provision of subsidized credit by government agencies and the implementation of selective credit policies. Various regulatory and targeting mechanisms were used to induce the flow of credit to the rural sector. These measures included : 1) the Credit Quota System which required all banks to set 25% of new loanable funds for agricultural credit; 2) the Deposit Retention Scheme which required all branches and extension offices of commercial banks and thrift banks to invest 75% of total deposit rates as well as on lending rates; and 3) the availment of special time deposits (STDs) and rediscounting from the Central Bank. These policies adversely affected the rural financial system and the welfare of small farmers in several ways.

Subsidies were largely captured by formal lenders not by farmer-borrowers. Rural banks became mere lending conduits of the governments' cheap funds. Since little effort was directed to savings mobilization, many rural banks became insolvent when the supply of rediscounting funds declined.

Among others, the Government learned from experience that agriculture production and poverty alleviation programs through credit support do not mix. Thus, the Government took a new stance by shifting from the subsidized credit policy and gradually moving towards its present policy of interest rate liberalization. The new framework for rural credit policy now contains the following basic elements:

- a greater role for the market mechanism in the allocation of financial resources,
- the termination of direct lending activities of non-financial government institutions, and
- increased private sector participation.

Post-harvest and marketing

Increase in yield is not only viewed in the context of improving production technology but reduction of post-harvest losses as well. Under this policy, NAPHIRE shall undertake an assessment of the availability and adequacy of post-harvest facilities to create benchmark data which will be the basis of a comprehensive plan for post-harvest development of grains.

The Government envisions the increased participation of the private sector in the marketing of agricultural products. This shall be promoted through increase in infrastructure such as roads and corresponding transport facilities, communication and trading centers. For small farmers to compete, cooperative development shall be strengthened.

3.2.2 Development programs and projects

Department of Agriculture (DA)

In 1993, the Department of Agriculture (DA) started to implement the Medium-Term Agricultural Development Plan (MTADP) in line with the "Philippines 2000" which aims to achieve global competitiveness and people empowerment. DA has launched the following four banner programs where resources and government support shall be focused with their major components.

(1) Grains Production Enhancement Program (GPEP)

This program has the following components:

1) certified seed subsidy,
2) production technology development and dissemination,
3) credit,
4) irrigation support,
5) postharvest facilities and technology support,
6) monitoring and evaluation, and
7) information dissemination.

Under the irrigation support for GPEP, NIA shall enhance irrigation service delivery in their irrigation service areas. Out of the 174,161 ha service area, about 77% and 66% shall be irrigated during the wet and dry seasons, respectively. Centrial Luzon shares about 27% of the total irrigated area under GPEP (Table 3.5 and Figure 3.3).

(2) Medium-Term Livestock Development Program (MTLDP)

This program consists of the following:

1) Preparation of stock farms to accommodate the incoming breeder cattle shipments;

2) Conduct of consultations with LGUs in preparation for the implementation of the program;
3) Declaration of support by the private sector for the MTLDP through the importation of heifers;
4) Identification of possible funding sources by BAI and ADB;
5) Increase in the production of vaccines in anticipation of their increased requirements; and
6) Application by BAI of the Foot and Mouth Disease (FMD) - free zones in the country to the ASEAN FMD Study Team.

(3) Fisheries Sector Program (FSP)

This program provides a comprevensive support package for the fishery sector as follows.

1) Fisheries resource and related ecological assessments
   - Establishment of the National Fisheries Information System (NFIS),
   - Nearshore fisheries and related ecological assessments in 12 priority areas,
   - Aquaculture and inland fisheries census and assessments in six priority regions, and
   - Tuna stocks assessments in selected offshore areas.

2) Coastal resources management
   - Information campaign and training of target groups in 12 priority bays,
   - Community development among fisherfolk, and
   - Resource enhancement programs.

3) Research and extension
   - Preparation of the National Fisheries Research Program (NFRP),
   - Establishment of a national network of existing research facilities,
   - Facilities upgrading and research scholarships in four centers,
   - Specific research programs for coastal/municipal aquaculture, and commercial fisheries development,
   - Preparation of a new extension program, and
   - Retraining of extension staff.

4) Credit
   - Marketing and information/training program, and
   - Provision of credit.

5) Law enforcement

6) Infrastructure program (improvement and rehabilitation of fisheries postharvest and refrigeration facilities, etc.)

(4) Key Commercial Crops Development Program (KCCDP)

This program was already described in subscription 1.1.2.

Department of Agrarian Reform (DAR)

The Comprehensive Agrarian Reform (CARP) Program being implemented by DAR is one of the most typical programs which aim to promote equity and social justice by redistributing resources and opportunities. To accelerate the attainment of the CARP objective, the Agrarian Reform Communities (ARCs) development strategy was adopted in 1993 by introducing an area-focused approach.

It is designed to showcase "people enpowerment" to spur agricultural development and stimulate agro-industrialization in the Country in order to improve the farmers' quality of life. In the succeeding years, no less than a thousand ARCs will be developed towards the attainment of the CARP vision of creating a truly vibrant and prosperous countryside in the Philippines by the year 2000.

ARCs are clusters of barangays of farmer-beneficiaries which are given full support to undertake economic and livelihood projects. In order to fully accelerate agrarian reform communities (ARCs), DAR has designated three strategic operating provinces (SOPs) in Central Luzon : Bulacan, Nueva Ecija and Pampanga. These are also the areas where full provincial and national support funds are given to accelerate the CARP.

(1) Agrarian Reform Communities (ARCs) Development Program / CARP

This program consists of the following.

1) Land tenure improvement (LTI)
   - Land transfer sub-program and
   - Non-land transfer sub-program.

2) Land use management and development program

3) Agrarian legal assistance

4) Beneficiaries development
   - Focus on increasing farm productivity and income,
   - Provision of basic physical infrastructure support,
   - Strategic and area-focused approach,

- More integrated approach to countryside development,
- Development of agro-industrial area and CARP model community projects,
- People-empowerment and participation through focused government and private partnerships,
- Improved inter-agency coordination,
- Focused information and education programs, and
- Agrarian reform personnel capability strengthening.

(2) Settlement projects

In Central Luzon, settlement programs (including evacuation, relocation and resettlement) are now actively promoted by the provincial CARP implementing teams organized in each province (PCIT : multi-agency organization led by DAR), especially for the victims of Mt. Pinatubo eruptions as well as sufferers from other natural disasters.

The inventory of settlement projects in Central Luzon (accomplishments as of December 1992) is given in Table 3.6. With the four settlement project sites in the region, the total area amounts to 2,395 ha with 6,014 farmer-beneficiaries.

Department of Environment and Natural Resources (DENR)

(1) Integrated Social Forestry Program (ISFP)

The Integrated Social Forestry Program (ISFP) is a people-oriented program launched in July 1982 by Letter of Instructions (LOI) 1260 designed to :

- improve the socio-economic conditions of upland farmers and communities depending on forest lands for their livelihood,
- enhance ecological stability, and
- maximize upland productivity.

The program seeks to reduce poverty, promote social justice, and protect the environment through proper stewardship of the upland.

In Central Luzon, a total of 20,905.4 ha of the Certificate of Stewardship Contract (CSC) areas were awarded to 9,476 upland farmers, as of 1990 distributed by province as shown below.

IFSP Area and No. of Contracts Issued in the Central Luzon

Province	Area in hectares		No. of Contracts	
Bataan	1,998.75	(9.5)	945	(10.0)
Bulacan	4,920.00	(23.5)	790	(8.3)
Nueva Ecija	4,551.15	(21.8)	2,552	(26.9)
Pampanga	1,917.03	(9.2)	50	(0.5)
Tarlac	4,053.79	(19.4)	2,022	(21.4)
Zambales	3,464.71	(16.6)	3,117	(32.9)
Total	20,905.43	(100.0)	9,476	(100.0)

Source : Regional Master Plan for Forest Development, DENR, July 1992.

(2) Watershed Forest Reserves Development Projects

The following projects are planned to be promoted by the Regional Offices.

1) Peñaranda River Watershed Forest Reserve (WFR), Peñaranda, N. Ecija
14,887 ha, Irrigation, DENR, LGU & MGD

2) Balog-balog WFR, Tarlac, Tarlac
28,025 ha, Irrigation, DENR, LGU & MGD

3) O'Donnel WFR, Capas, Tarlac
29,000 ha, Irrigation, DENR, LGU & MGD - (F/S completed by ADB/OECF)

4) Dona Remedios Watershed, San Miguel, Bulacan

5) Talavera River Watershed, Nueva Ecija - (F/S completed by ADB/OECF)

6) Sta. Cruz Watershed, Zambales - (F/S completed by ADB/OECF)

7) Pampanga Watershed, Tarlac & Pampanga (Pamyonga)

8) Pantabangan Watershed, Pampanga - Drain towards Pampanga River

(*Supporting Regional Industrial Centers*)

9) Mariveles, Bataan - Mariveles Watershed

- Location : Mariveles, Bataan
- Area : 325 ha
- Purpose : Potable & Irrigation
- Agency Concerned : DENR

10) Subic, Zambales

- Olongapo watershed, Olongapo, Zambales
- 6,424 ha, Potable & Irrigation, DENR
- 2. Subic Watershed, Olongapo, Zambales
- 10,000 ha, Potable & Irrigation, DENR

Other major related programs and projects which are being implemented by various agencies and offices are the following.

Programs / Projects	Implementing Agency
- Project Self-Reliance	Department of Agriculture (DA) / National Food Authority (NFA)
- Kakipunan ng mga Irrigators' Service Association (KAISA)	DA - Regional Field Operations
- Farm Level Grains Center	National Agricultural and Fishery Council (NAFC)
- Promotion and Commercialization Program	National Post-Harvest Institute for Research and Extension (NAPHIRE)
- Land Bank Of the Philippines (LBP)	
- CARP Barangay Marketing Center	Quedancor
- JICA - Assisted PHF Program	NFA
- Livelihood Enhancement for Agricultural Development	DA
- Comprehensive Agricultural Loan Fund	LBP, PCIC & Quedancor
- Integrated Rural Finance Program	LBP
- Rural Bank Rehabilitation Program	LBP
- Small Water Impounding Projects (SWIPs)	DPWH, NIA, BSWM & NEA (OECF and local funds) (As for the candidate project list, refer to Table 3.7)
- Small Reservoir Irrigation Projects (SRIPs)	NIA (As to the project list, refer to Table 3.8)
- Diversified Crops Irrigation Engineering Project (DCIEP - Phase I & II)	NIA-JICA

- Small Scale Irrigation Development Projects (SSIDPs)	NIA
- Pampanga Delta Development Project -Irrigation Component (PDDP-IC)	NIA
- Munoz Science Community Development Plan	Multi-agency group consisting of GOs, LGUs & NGOs, located in Muñoz (NE)

3.2.3 GO and NGO collaboration in rural and agricultural development

People empowerment means transferring substantial decision-making power to the people. This implies harnessing the people's potential to take responsibilities for their own development. Self-reliance and self-management are seen as inherent in the process of community development. To realize this, rural organizations particularly cooperatives shall play pivotal roles.

Recent rural development undertakings of the Government are now anchored on the development of people's organizations such as cooperatives. Activities of cooperatives in agricultural production are complemented and supported by the Government. Through the Government's machinery, cooperatives are able to avail of support in credit to provide farmer-members with inputs and technology to enhance production. Marketing and trading are facilitated not through price meddling but through provision of infrastructure.

CHAPTER 3

TABLES

Table 3.1 Constraints/Problems and Potentials/Opportunities for Agricultural Development in Central Luzon

Problems / Constraints	Potentials / Opportunities
A. Low Crop Productivity due to:	**A. Crop Production**
1. Persistent practice of traditional methods of farming	1. Potential area for agricultural development and expansion
2. Lack of appropriate production technology	2. Suitability of soil to various crop types
3. High cost of farm inputs	3. Favorable climate
4. Lack of farm machineries and equipment	4. Wide potential area for irrigation development and existing irrigated areas
5. Inability of most farmers to afford farm inputs and modern technology	5. Huge surplus in agri. production
6. Large post harvest losses	6. Vast agricultural land
7. Frequent occurence of calamities	7. Potential for industrial crops
8. Poor irrigation facilities	8. Suitability to feedgrain production
9. Inefficient marketing system	9. Hilly/sloping land development
10. Inadequate post harvest facilities	10. Development of small water reservoirs
11. Unstable prices of farm produce	
12. Low prices of farm products	
13. Lack of marketing outlets	
14. Lack of processing facilities	
B. Livestock/Poultry Production	**B. Livestock Production**
1. Poor feeding management	1. Production of feedgrains and feed ingredients
2. High cost of feeds & pasture development	2. Improved pasture development
3. Breed deterioration due to high cost of pure	3. Generation of appropriate technology in livestock production
4. Breed stocks	4. Intensification of extension and veterinary services
5. Poor maintenance of artificial insemination centers	5. Establishment of a functional livestock marketing system
6. Limited support for backyard raisers	
7. Inavailabity of assembled marketing sys.	
8. Limited support to backyard raisers	
C. Fishery Production	**C. Fishery Production**
1. Low quality of fingerlings	1. Long coastline for marine fishery
2. Inadequate technical assistance	2. Rehabilitation of marine fishery resources and exploitation of the exclusive Economic Zone
3. Destruction of coral reefs	3. Establishment of fish sanctuaries
4. Siltation of major rivers opening to the sea	4. Mangrove reforestation (in coordinating with DENR)
5. Unregulated coral mining	5. Mariculture especially on lakes & coves
6. Lack of capital	6. Fishpond development
7. Laxity in the enforcement of fishery laws	7. Establishment of nursery/hatchery for freshwater fishes
8. Lack of post-harvest facilities	8. Development of fish landing centers and fish processing
9. High cost of inputs	
10. Recurrent occurence of red tide	
D. Infrastructure Support Facilities	**D. Infrastructure**
1. Poor infrastructure such as farm-to-market roads, irrigation system, harvest facilities like warehouses, driers, etc.	1. Availability of land access to major cities and other provinces
2. High transport cost	2. Presence of local power source

Table 3.1 Constraints/Problems and Potentials/Opportunities for Agricultural Development in Central Luzon

Problems / Constraints	Potentials / Opportunities
E. Tenurial Status and Improvement	**E. Land Tenure Status and Improvement**
1. Slow approval of land survey returns 2. Lack of funds for land survey 3. Refusal of lansowners to surrender TCT 4. Technical difficulties in conduct of surveys 5. Prolonged negotiations in land acquisition 6. Illegal and/or hasty conversion of lands to non-agricultural purposes	1. Distribution of lands before 1998 2. Execution of leasehold contracts
F. Other Support Services	**F. Support Services**
1. Lack of other income-generating opportunities 2. Low prices of farm products 3. Lack of marketing facilities 4. Lack of skills/capabilities for livelihood activities 5. Weak farmers' cooperatives 6. Inadequate support services	1. Abundant banking institutions to provide credit 2. Presence of NGOs and POs to serve as development partners
G. Government Capability to Address Identified Problems	**G. Potential Markets**
1. Budget constraints 2. Lack of viable and sustainable agricultural institutions 3. Lack of skills/capabilities in organizational and livelihood/ enterprise development	1. Presence of special economic zones 2. Access to large market centers 3. Establishment of processing plants
H. Other Issues	**H. Others**
1. Adverse effect of Mt. Pinatubo eruption 2. Insufficient livelihood projects and employment opportunities to cope with the pressure of an increasing population	1. Availability of small, medium and large scale investors 2. Favorable location 3. Presence of urban prime centers 4. Major supplier of rice to MM

Source : JICA Team's prospects

Table 3.2 Forest Destruction by Region, 1991

(Unit : km2)

Region	Kaingin	Illegal Logging	Typhoon	Forest Fire	Total	(%)
CAR	-	-	-	605	605	(8.4)
1	45	-	458	398	901	(12.5)
2	-	-	-	303	303	(4.2)
3	270	3	-	2,707	2,980	(41.2)
4	87	-	-	1,694	1,781	(24.6)
5	12	27	-	-	39	(0.5)
6	81	-	72	78	231	(3.2)
7	5	22	-	45	72	(1.0)
8	-	-	-	-	-	-
9	72	-	-	36	108	(1.5)
10	-	-	-	-	-	-
11	187	20	-	6	213	(2.9)
12	-	-	-	-	-	-
Philippines	759	72	530	5,872	7,233	(100.0)

Source : 1991 Philippine Forestry Statistics, FMB, DENR

Table 3. 3 Irrigated Area, 1988-1992

(Unit : hectares)

Name of Irrigation System	Service area	1988		1989		1990		1991		1992	
		Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
Angat-Maasim RIS	31,485	27,728	23,400	27,828	24,821	12,976	25,319	28,345	24,141	27,966	23,880
Porac-Gumain RIS	4,486	3,431	3,996	3,692	4,186	3,675	4,201	3,713	-	1,307	530
Colo-Caulaman RIS	513	907	868	892	1,038	1,027	1,130	1,043	400	541	378
Nayom-Bayto RIS	1,948	799	920	817	956	1,464	1,675	1,602	1,664	1,623	1,628
Tarlac-Sn.Miguel-O'donnel RIS	13,976	2,465	9,196	2,500	9,868	2,500	9,172	3,864	-	447	1,576
Camiling RIS	8,580	2,550	6,825	2,310	6,984	3,177	6,451	3,060	7,263	2,909	6,965
Bucao RIS	1,231	1,003	683	1,004	-	1,000	-	908	-	250	-
Nueva Ecija PIS	1,313	674	843	853	605	923	689	759	673	601	323
UPRIIS	103,285	41,794	82,229	66,814	85,211	77,402	84,813	83,701	77,568	78,441	86,058
TOTAL	166,817	81,351	128,960	106,710	133,669	104,144	133,450	126,995	111,709	114,085	121,338

Source: National Irrigation Administration, Region III
Upper Pampanga River Integrated Irrigation System

Table 3.4 Irrigated and Non-Irrigated Paddy Production Performance, 1988 -1992

Province	1988		1989		1990		1991		1992	
	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed
Volume (MT)										
Region III	1,013,510	257,325	1,377,707	307,243	1,437,626	473,304	1,405,118	343,373	1,390,193	345,743
Bataan	56,968	400	59,455	150	62,852	218	54,122	198	64,266	458
Bulacan	190,127	93,126	249,708	92,775	224,489	101,446	224,346	86,837	229,409	74,654
Nueva Ecija	423,172	78,737	637,191	131,286	710,004	261,759	750,428	171,023	711,917	153,887
Pampanga	150,329	10,013	179,821	12,709	178,476	24,282	157,832	9,617	156,875	8,238
Tarlac	156,129	54,702	208,744	47,372	214,551	57,627	183,020	65,642	205,708	94,825
Zambales	36,785	20,347	42,788	22,951	47,254	27,972	35,370	10,056	22,018	13,681
Harvested Area (ha)										
Region III	343,740	121,310	401,170	116,220	387,570	134,070	376,900	122,970	353,200	118,390
Bataan	20,180	200	17,090	70	17,210	90	16,700	70	16,890	160
Bulacan	53,410	29,760	58,890	25,740	52,390	26,720	56,870	26,940	60,990	22,550
Nueva Ecija	144,470	43,220	179,580	54,690	175,850	64,630	183,550	58,190	172,130	52,770
Pampanga	45,820	5,040	49,680	4,180	45,200	6,390	39,220	3,580	36,290	2,440
Tarlac	64,530	31,650	79,340	20,380	80,050	25,050	67,470	30,520	57,880	34,840
Zambales	15,330	11,440	16,590	11,160	16,870	11,190	13,090	3,670	9,020	5,630
Productivity (MT/ha)										
Region III	2.90	2.08	3.35	2.59	3.57	3.15	3.45	2.76	3.67	2.94
Bataan	2.82	2.00	3.48	2.14	3.65	2.42	3.24	2.83	3.80	2.86
Bulacan	3.56	3.13	4.24	3.60	4.28	3.80	3.94	3.22	3.76	3.31
Nueva Ecija	2.93	1.82	3.55	2.40	4.04	4.05	4.09	2.94	4.14	2.92
Pampanga	3.28	1.99	3.62	3.04	3.95	3.80	4.02	2.69	4.32	3.38
Tarlac	2.42	1.73	2.63	2.32	2.68	2.30	2.71	2.15	3.55	2.72
Zambales	2.40	1.78	2.58	2.06	2.80	2.50	2.70	2.74	2.44	2.43

Source : Bureau of Agricultural Statistics (BAS)

Table 3.5 National Irrigation Systems for Grains Production Enhancement Program (GPEP), CY 1993-94

Region/Provinces	No. Systems	Service Area (ha)	Program Area (ha)		Total (ha)	(%)
			Wet Season	Dry Season		
CAR	-	18,153	10,526	11,010	21,536	2.5
Region I	16	36,031	25,110	14,874	39,984	4.6
Region II	20	120,034	102,805	102,279	205,084	23.8
Region III	**12**	**164,161**	**127,106**	**109,809**	**236,915**	**27.5**
- Bataan	1	483	233	172	405	(0.0)
- Bulacan	1	31,485	24,500	27,960	52,460	(6.1)
- Nueva Ecija	5	104,598	90,904	75,872	166,776	(19.4)
- Pampanga	2	5,039	2,269	1,442	3,711	(0.4)
- Tarlac	3	22,556	9,200	4,363	13,563	(1.6)
Region IV	28	41,173	30,448	26,389	56,837	6.6
Region V	12	17,469	13,645	14,215	27,860	3.2
Region VI	12	57,476	49,887	35,111	84,998	9.9
Region VIII	16	15,633	12,577	11,486	24,063	2.8
Region IX	3	13,562	9,992	8,684	18,676	2.2
Region X	4	18,780	11,751	11,351	23,102	2.7
Region XI	14	58,957	37,257	34,717	71,974	8.4
Region XII	6	30,643	28,350	15,453	43,803	5.1
ARMM	2	4,383	3,126	2,802	5,928	0.7
Total	145	596,455	462,580	398,180	860,760	100.0

Source : Grains Production Enhancement Program (GPEP) Irrigation Infrastructure Support Component Progress Report, 30 June 1993, NIA

Table 3.6 Inventory of Settlement Projects in Central Luzon (Accomplishments as of December 1992)

Settlement Project	Location	Proclamation Number	Date Proclaimed	Date Opened	Proclamed Area (ha)	Area as Surveyed (ha)	No. of Settler-Families	Cumulative Accomplishments	
								Area (ha)	No. of HP/CLOA**
1. Pag-Asa (Tarlac) *	Capas-Bamban, Tarlac.& Botlan, Zambales	554	05-15-69	1974	11,039	10,778	6,056	739	1,392
2. Nueva Ecija No. 1 (Parcel A & B)	Pantabangan-Bongabon, Nueva Ecija & Maria Aurora, Quezon	983 Amended by 1355	12-03-74	1972	9,019	10,367	18,982	1,463	4,461
3. Nueva Ecija No.2 (Gen. Ricarte Agri Coop, Inc.)	Gen. Ricarte, Llanera, Nueva Ecija	LOI No.253	02-19-75	1975	351	No survey	1,036	0	0
4. Maria Sinukunan Agri. Cooperative	San Agustin, Magalang, Pampanga	681	04-15-70	1970	756	755	1,878	193	161
Sub-total					21,165	21,900	27,952	2,395	6,014

Source : Bureau of Land Aquisition and Distriibution (BLAD), DAR

Note : * Zone E & F affected by Mt. Pinatubo eruption.

** HP/CLOA or FBs = Homestead Patent / Certificate of Land Ownership Award or Farmer Beneficiaries

Table 3.7 Status of 25 Candidate Small Water Impounding Projects (SWIPs)

Candidate Projects			Present Status
Package	Name of Project	Location Municipality, Province, Region	
1-A	BSWM - 98 Sto. Nino SWIP BSWM - 112 Campin SWIP	Taliboo, Bohol, VII Mahaplag Leyte, VIII	• Under construction (started on March 16, 1993) • Work progress : Sto. Nino SWIP - 60.5% as of October 25 and Campin SWIP - 22.8% as of October 25. • Contractor - Green Asia Construction and Development Corporation
1-B	BSWM - 110 Inamburakay SWIP BSWM - 114 Polangi SWIP	Bobon, Northern Samar, VIII Taft, Eastern Samar, VIII	• Under construction (started on March 16, 1993) • Work progress : Balikbayan SWIP - 55.3% as of October 25 and Florida SWIP - 45.1% as of october 25. • Contractor - L.S. Sarmiento and Company, Inc.
1-C	BSWM - 126 Balibayon SWIP BSWM - 139 Florida SWIP	Surigao, Surigao del Norte, X Kapalong, Davao del Norte, XI	• Under construction (started on March 16, 1993) • Work progress : Balikbayan SWIP - 55.3% as of October 25 and Florida SWIP - 45.1% as of october 25. • Contractor - L.S. Sarmiento and Company, Inc.
2-A	BSWM - 161 Sto. Domingo III SWIP	Lupao, Nueva Ecija, III	• Under preparation of Contract Documents • Contractor - Eapius Dynamic Builders • Construction will start on December 1993.
2-B	BSWM - 77 Lagunlong SWIP	Baco, Oriental Mindoro, IV	• Under preparation of Contract Documents • Contractor - Dimson (Manila), Inc. • Construction will start on December 1993.
2-C	BSWM - 99 Nangka SWIP	Bayawan, Negros Oriental, VII	• Notice to Proceed from DPWH on October 14, 1993 • Contractor - A.V. Adlawan Construction • Construction will start on Mid of November 1993
2-D	BSWM - 111 Sta. Fe SWIP	Borongan, Eastern Samar, VIII	• Under preparation of Contract Documents • Contractor - Unimasters Conglomeration, Inc. • Construction will start on December 1993.
2-E	BSWM - 141 San Nicolas SWIP	Digos, Davao del Norte, XI	• Under preparation of Contract Documents • Contractor - Four Ace Technology Construction, Inc. • Right of way problem is encountered
3	DPWH - 12 Macagtas SWIP	Catarman, Northern Samar, VIII	• Under preparation of Contract Documents • Contractor - Unimasters Conglomeration, Inc. • Right of way problem is encountered
4-A	NIA - 6 Potot SWIP	Milagros, Masbate, V	• Completion of revision works of bid drawings and submission to BOD, DPWH for approval.
4-B	NIA - 7 Caramoan SWIP	Caramoan, Camarines Sur, V	- do -
5-A	BSWM - 62 Maestlipit SWIP	San Miguel, Bulacan, III	• Under bidding - Bidding on November 9, 1993
5-B	BSWM - 65 Maninioc SWIP	Mayantoc, Tarlac, III	- do -
5-C	BSWM - 83 Bulhao SWIP	Labo, Camarines Norte, V	• Under bidding - Bidding on November 11, 1993
5-D	BSWM - 85 Gabawan SWIP	Daraga, Albay, V	- do -
6-A	BSWM - 90 Panlagangan SWIP	Sibalom, Antique, VI	• Under bidding - Pre-bid conference on November 2 and bidding on November 16, 1993
6-B	BSWM - 91 Traciano SWIP	Dumarao, Capiz, VI	- do -
6-C	BSWM - 117 Woodland SWIP	Dumalinao, Zamboanga del sur, IX	• Under bidding - Pre-bid conference on November 2 and bidding on November 18, 1993
6-D	BSWM - 120 Lamare I SWIP	Bayog, Zamboanga del Sur, IX	- do -
6-E	BSWM - 131 Malapong SWIP	Buenavista, Agusan del Norte, X	• Under bidding - Site inspection on November 3 to 6, pre-bid conference on November 8 and bidding on November 23, 1993.
6-F	BSWM - 133 Kitao-Tao SWIP	Kitao-Tao, Bukidnon, X	- do -
7	NIA - 11 Tugas SWIP	Candijay, Bohol, VII	• Prepared report on prequalification evaluation and under deliberation by PBAC.

Note : Projects "shaded" are located in the Region III (Study Area).
Source : PMO - SWIM

Table 3.8 Small Reservoir Irrigation Projects (SRIPs) in Central Luzon Schemed by NIA

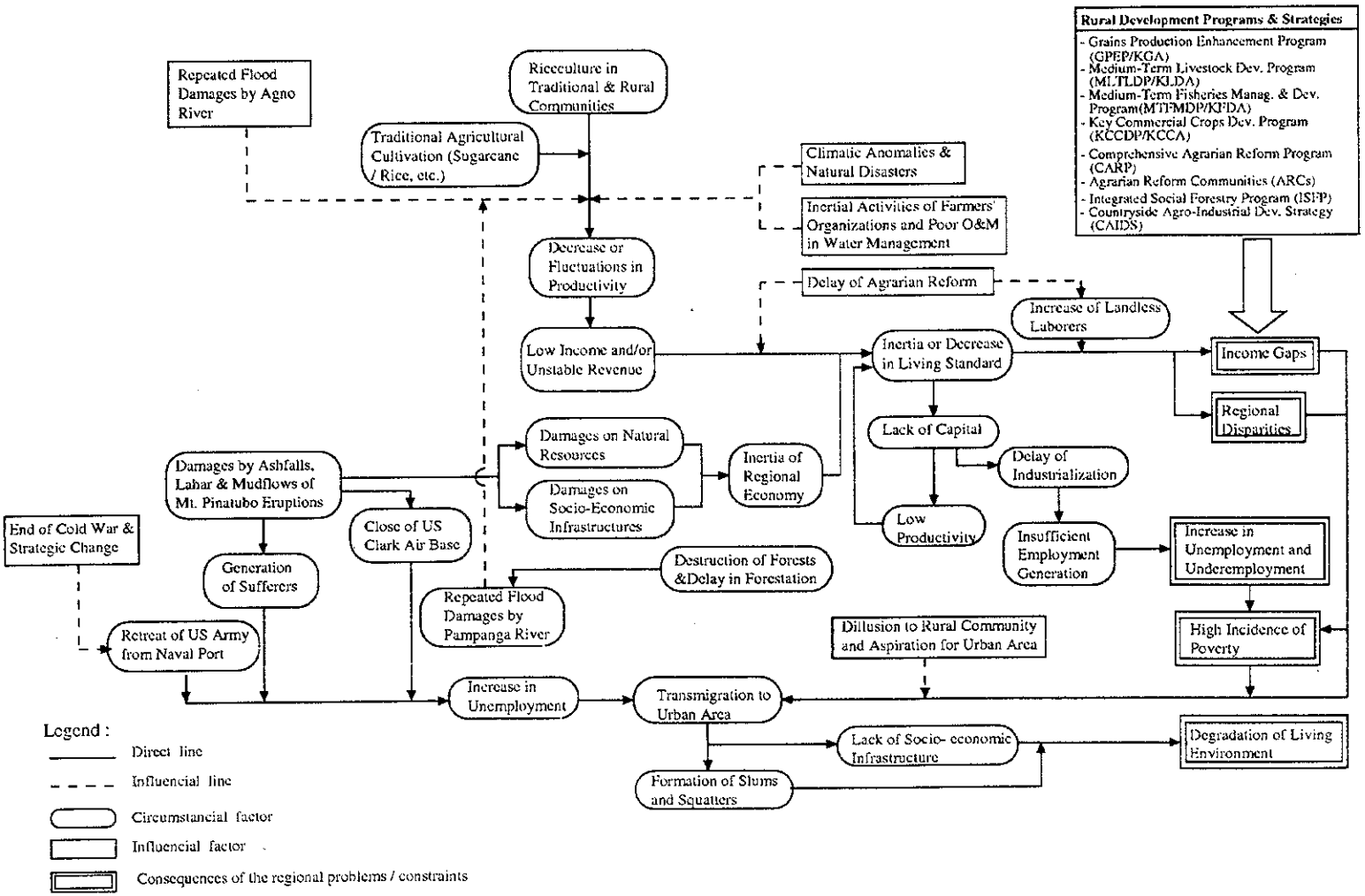
Project / Location	Service Area (ha)	Estimated Cost (P1.0 M)			Implementation Schedule			
		Dam Aspect	Irrigation Compo.	Total	Starting Year		Completion Year	
1. Aliabon, Dinalupihan, Bataan	500	67.40	22.50	89.90	July	1994	June	1996
2. Tangilad, Samal, Bataan	400	139.92	18.00	157.92	July	1994	June	1996
3. Aulo, Palayan, Nueva Ecija	775	230.03	34.88	264.91	July	1994	June	1996
4. Balbalongao, Lupao, Nueva Ecija	1,000	135.00	45.00	180.00	Jan.	1997	Dec.	1998
5. Bayog, Laur, Nueva Ecija	230	43.22	10.35	53.57	July	1995	June	1997
6. Lupao, Lupao, Nueva Ecija	600	64.39	27.00	91.39	Jan.	1991	Jan.	1993
7. Matingkis, Munoz, Nueva Ecija	300	63.00	13.50	76.50	Jan.	1997	Dec.	1998
8. Mayomot II, Talugtug, Nueva Ecija	150	42.75	6.75	49.50	Jan.	1997	Dec.	1998
9. Namunluandayan, Lupao, Nueva Ecija	300	63.00	13.50	76.50	Jan.	1997	Dec.	1998
10. San Isidro, Lupao, Nueva Ecija	750	112.50	33.75	146.25	Jan.	1997	Dec.	1998
11. Upper Tabuating, Gen. Tinio, Nueva Ecija	495	132.00	22.28	154.28	Jan.	1997	Dec.	1998
12. Kawili-Wili, Capaz, Tarlac	300	63.00	13.50	76.50	Jan.	1997	Dec.	1998
13. San Clemente, Sn Clemente, Tarlac	1,160	147.13	52.20	199.33	Jan.	1993	Oct.	1994
Total	6,960	1,303.34	313.21	1,616.55	-	-	-	-

Source : SRIP Office, NIA

CHAPTER 3

FIGURES

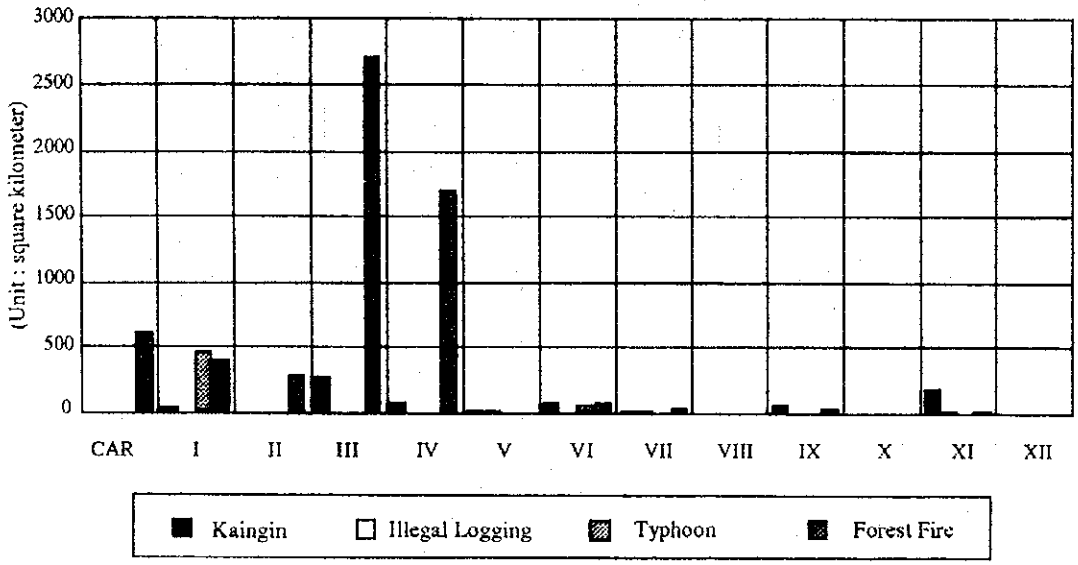
Figure 3.1 Problem Structure for Central Luzon Agriculture



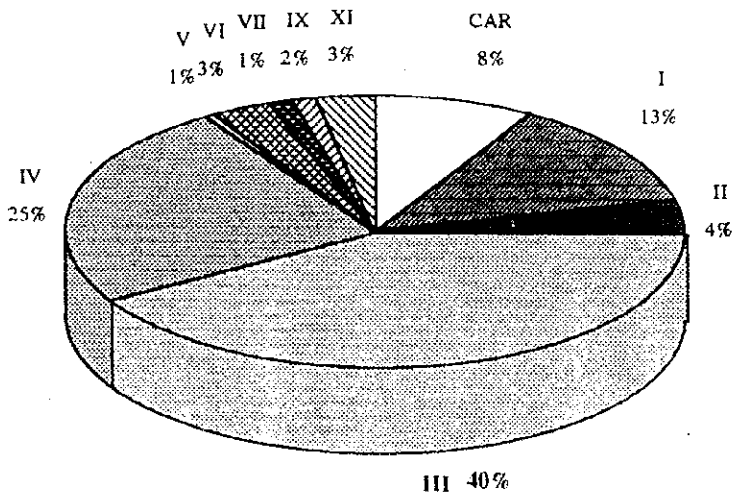
Source : JICA Study Team

Figure 3.2 Forest Destruction by Region, 1991

(1) Forest Destruction by Region, 1991

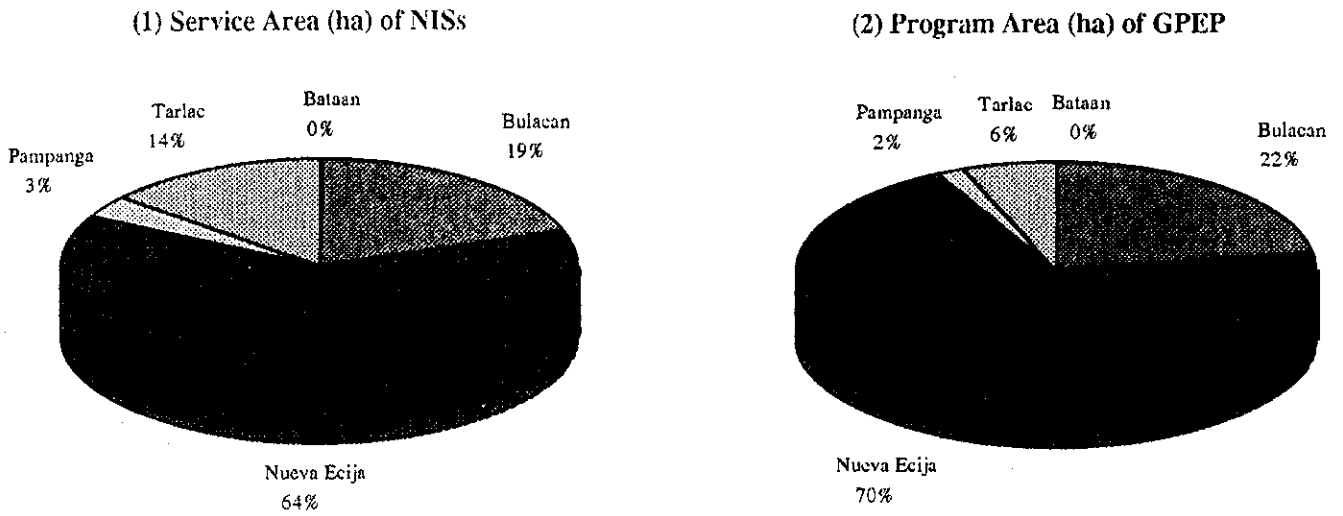


(2) Total Forest Destruction in Region III



Source : 1991 Philippine Forestry Statistics, FMB, DENR

Figure 3.3 National Irrigation Systems for Grains Production Enhancement Program (GPEP), CY 1993-94



Source : Grains Production Enhancement Program (GPEP) Irrigation Infrastructure Support Component Progress Report, June 1993, NIA

CHAPTER 4

CHAPTER 4 AGRO / SOCIO-ECONOMIC SURVEY

4.1 Objectives

As part of the CLDP Master Plan Study, an agro/socio-economic survey was conducted. Objectives of the survey were:

(1) to determine socio-economic conditions of the people engaged in agriculture and fisheries,
(2) to examine profitability of farming and fishing activities, and
(3) to assess government support services to farmers and fishermen.

4.2 Survey Method

An interview/questionnaire type of survey (at random sampling) was conducted utilizing a structured questionnaire. There were two groups of respondents targeted: crop and livestock farmers and small fishermen. Sampling survey areas are illustrated in Figure 4.1.

The crop and livestock survey was carried out in all the six provinces of Central Luzon. The total number of respondents for this sector was 600. The fishery survey was conducted in the three provinces of Bataan, Bulacan and Zambales as they have a reasonable number of fishermen engaged in municipal marine fishing. Survey for this sub-sector was represented by 300 respondents. Distribution by province, municipality and barangay was as follows.

	Crop and Livestock	Fisheries
Number of provinces	6	3
No. of municipalities per province	5	5
Total no. of municipalities	30	15
No. of barangays per municipality	2	2
Total no. of barangays	60	30
Total no. of respondents	600	300
No. of respondents per province	100	100
No. of respondents per municipality	20	20
No. of respondents per barangay	10	10

Municipalities and barangays considered in this survey were selected according to the magnitude of agricultural and fishing activities. Due to lack of secondary data to assess indicators, DAR and DA Region III Offices were asked to recommend preferential

municipalities and barangays. Actual interviews were conducted by 45 enumerators: 30 for crop and livestock sub-sector and 15 for fisheries sub-sector.

4.3 Data Arrangement

Data collected were arranged through an electronic data processing. Data were presented in tables according to indicators grouped under five main parameters as shown below. Data for the two sub-sectors were processed and analyzed separately.

General profile: age/ sex/ occupation/ education/ sources of income/ number of household members including head of households

Living circumstances: major income sources/ annual income from major crops/ other sources of income (minor)/ house ownership/ type of houses/ household convenience and facilities such as water and power supply and sources/ other properties such as house appliance and vehicles/ sources of household commodities/ living expenses/ presence of different types of infrastructure/ availability of social services such as health and education/ environmental factors/ experiences on natural calamities.

Farming condition: land tenure/ sizes of farmland (owned and cultivated)/ status of land ownership/ land areas devoted to different types of crops and other uses/ wet and dry season crops/ rental or sharing schemes in case of lessors and tenants/ raising of livestock and poultry/ fishery activities/ use of farm labor, machinery, fertilizers, agro-chemicals, etc./ difficulties encountered in acquiring farm inputs/ existence of irrigation facilities/ experience on losses/ price determinants in product marketing/ problems in marketing of products/ availability of credit and crop insurance facilities/ availability of extension services/ government and non-government agencies involved in the delivery of these services/ membership in cooperatives and other rural institutions.

Fishing condition: peak and lean months of fishing/ fishing trips made and number of hours spent/ fishing grounds and reasons for preference/ landing sites and reasons for preference/ quantity and species caught and landed/ problems encountered in fishing activities/ sharing of catch/ market outlets/ manner of selling/ terms of sale/ prevailing price information system/ credit facilities/ participation in community organizations/ benefits derived from these organizations/ presence of extension services/ level of satisfaction on these services.

Farmers' and fishermen's requirements: ideas on how to improve their production and living conditions/ support expected from the government/ programs that could help them improve their living condition.

4.4 Results of Agro/Socio-Economic Survey

4.4.1 General profile

Respondents to the survey are heads of respective households. Other members of any household include all persons living in one house who share expenses of the household. They are either members of the family, other relatives or household helps.

Respondents

More than 50% of the farmer-respondents (farmers) are above 50 years old, 24% are 41-50 years old. The rest (26%) are below 40 years old and are considered younger respondents. For each province, older farmers, i.e., above 50 years old share about the same portion of total respondents, respectively. Pampanga has the highest percentage (65%), while Zambales has the lowest (42%).

Fishermen-respondents (fishermen) are generally within the younger age bracket compared to farmers. About 23% are above 50 years old, 27% are within 41-50 years and 50% are below 50 years old.

Largely, farmers have elementary level of education (62%) and high school level (26%). Fishermen have generally elementary (61%) and high school (30%)level of education.

Other members of households

Other members of households are generally young. Among farmers' households, about 44% are 18 years old and below and 18% are 19 to 24 years old, while fishermen's households consist of 58% and 13% in these age classes, respectively.

Comparatively, fishermen's households have higher percentage (26%) of members without education. About 14% of the farmers' total household members have no education while fishermen's has 26%. Of the total members of farmers and fishermen households without education, 16% and 65% respectively are with ages 7 years old and above.

Sizes of households

Households of most respondents have 5-6 members : 38% for farmers and 42% for fishermen.

4.4.2 Living circumstances

Family income and expenses

1) Household income

Most farmers earn below ₱30,000 annual income (53%). Higher income levels (i.e., above ₱80,000) account for 8% of the total respondents. Comparatively, more fishermen earn below ₱30,000 per annum (67%). Those who belong to a higher income level comprise only 3% of its total.

Members of farmers' and fishermen's households are generally without income (75% and 77%, respectively). Most of those who have income, earn only less than ₱20,000 per annum (55% of farmers' and 82% of fishermen's household members, respectively).

Majority of farmers' household members are not earning (74%). Among those who are earning, they derive their income mostly from employment and other sources such as pensions and allowances. Income of these members are mostly less than ₱30,000 per annum (₱2,500 per month).

Like other members of farmers' households, fishermen's households are mainly composed of non-income earning members (78%). Among the earners, 33% derive income from fishing and some 39% from other types of livelihood.

2) Other sources of income

About 16% of farmers receive remittances from relatives and friends working outside the province. Of these respondents' total, 75% receive from abroad and only 24% from other places in the Philippines. A very insignificant percentage of fishermen receive any remittance (10%). Most of these respondents also receive from abroad. About 3% of the total farmers receive pension either as veterans or retirement benefit.

3) Household expenses

Household expenses of farmer- and fishermen-respondents generally range from ₱24,000 per annum and above. About 38% of farmers' households spend more than ₱60,000 per annum and 46%, between ₱24,000 and ₱60,000. Among fishermen households, only 16% spend ₱60,000 per annum while 62% spend between ₱24,000 and ₱60,000.

Respondents generally spend much on food. Of farmer-respondents' households, 85% spend more than ₱1,000 monthly or ₱12,000 per annum for food. About 81% of fishermen-respondents has this level of expense on food items. On the average, many of these

respondents spend around ₱36,000 per annum or roughly ₱100 per day which is more or less equivalent to the income commonly earned by rural households. On other items, expenditure level is generally below ₱500 per month.

4) Housing facilities

Both farmers and fishermen generally own houses they live in (97% and 91%, respectively). Most respondents are relatively permanent in their dwelling places. Most of them have been living there for more than 20 years. Some 13% live in poor houses like shanties (nipa hut). A larger percentage of fishermen live in this type of houses (42%). Most houses are supplied with electricity (89% and 74% of the farmers and fishermen-respondents, respectively) which enables them to own appliances such as TV sets (85%-farmers and 58%-fishermen), refrigerators (41%-farmers and 14%-fishermen) and stereo sets (38%-farmers and 17%-fishermen).

Cooking fuels used are mainly fire wood (80% farmers and 54% fishermen) and charcoal (52% farmers and 22% fishermen). Water supply of 87% and 66% farmers and fishermen respondents, respectively is taken from groundwater (with the use of water pump). About 26% of farmers own vehicles. Among them, 49% own tricycles while others own jeepneys and jeeps (30% each). Of the six provinces, Bulacan has the largest number of respondents who own vehicles.

Rural infrastructure

Most farmer-respondents answer that national roads are generally good (79%). On the other hand, only 43% say that barangay roads are good and 45% say farm roads are bad to worst. Some 12% reply farm roads are not available in their barangays. These responses come mostly from Pampanga and Zambales. Generally, roads network width, pavement and maintenance are good and reasonable (68%, 72%, 63% and 57% respectively). For all the provinces, respondents are generally satisfied with transportation facilities. Drainage facilities are either not available, bad or worst (71%). Only 26% of respondents say that drainage facilities are good.

Fishermen-respondents give an answer that farm roads are not available and if ever available, they are in bad to worst conditions (56%). National roads are generally in good condition (95%). In general, the network and width of roads are good (75% and 73%, respectively). Transportation facilities are available and generally good (78%). About 22% of respondents say that transportation facilities are not available or in bad conditions. These responses are mostly from Bataan.

Drainage facilities are not available (57%). Only about 35% say that available facilities are good (mostly respondents from Bulacan and Zambales). Only about 61% of fishermen are served by a water system. Among them, 83% say that the service is good. Telecommunication services are generally not available among farmer-respondents (68%) and fisherman-respondents (76%). However, postal services are generally good (76% for farmers and 64% for fishermen).

Inconveniences felt by respondents in daily living circumstances are summarized in Table 4.1. Of farmer-respondents, 34.2% indicate that low income is the major trouble of their life, followed by poor infrastructure (17.9%), inadequate water supply (17.3%), poor public services (13.3%), poor housing (11.3%) and so on. In case of fishermen-households, the survey results reveal that low income (85.3%) constitutes a major problem, followed by poor housing (48.8%), poor public services (32.8%), poor infrastructure (20.1%), inadequate water supply (17.1%) and others.

4.4.3 Farming conditions

Land tenure

About 73% of respondents own the land they till. Of them, 32% are full owners, 34% amortizing owners (acquired from CARP distribution) and 7% own and lease. A significant portion, 34%, are lessees. Among the six provinces, Zambales has the largest number of full owners (42%), while Bataan and Bulacan have the most lessees corresponding to 55% and 52% of their respective totals. Nueva Ecija and Tarlac have the most amortizing owners, 66 and 61%, respectively. This indicates a larger scope and accomplishment of CARP in these two provinces.

Land sizes

About 62% of respondents cultivate 2.0 ha of land or less. These respondents are dominantly found in Zambales (83% with 50% tilling 1.0 hectare and less) and Bataan (71% with 43% tilling 1 to 2 ha). Respondents cultivating more than 5 ha constitute a very small portion of the total, only 3%.

The following table summarizes the general status of ownership and size of cultivated land.

Size of Land	Ownership Status		
	Owned	Leased	Tenanted
≦2 ha	61%	72%	50%
2 to 3 ha	23%	19%	27%
3 to 5 ha	14%	6%	12%
more than 5 ha	2%	3%	11%
Total	100%	100%	100%
No. of Respondents	381	204	40

This table shows that whether owned or not, respondents generally cultivate small pieces of land. However, the percentages of tenants cultivating larger piece of lands are more than owners and lessees.

Among non-owners, two different types of agreements are existing: payment of rental for the use of land and sharing of harvest. About 54% pay rental and 46% share harvest with landowners. Rental rates are based on the length of time (as per year) or per ha. In both cases, rental rates usually paid by respondents are within ₱1,000 to ₱5,000 for smaller than 2.0 ha land. Among those who are in the harvest sharing, 21% follow the 70-30 sharing scheme and 19% 50-50 sharing. About 57% are with the other type of sharing scheme.

Land use

All respondents are paddy farmers with about 65% cultivating irrigated lands and 36%, non-irrigated lands. Other crops cultivated consist of vegetables, sugarcane, rootcrops, legumes, fruit trees and others. The table below shows the number and percentage of respondents raising these crops.

	Number	% to Total Respondents
Irrigated paddy	388	65%
Non-irrigated paddy	217	36%
Vegetables	62	10%
Sugarcane	26	4%
Rootcrops	13	2%
Legumes	10	2%
Corn	24	4%

N.B. - Multiple answers are given to the raising crops.

Among the six provinces, Pampanga is most developed in diversified crop farming for sugarcane, rootcrops, corn and legumes. Vegetables are grown in all the provinces, particularly in Nueva Ecija (23%) and Zambales(13%).

Permanent crops mainly consist of fruit trees, coconut and banana. About 4% of respondents raise fruit trees and very few grow coconut (mostly found in Zambales) and banana (Bataan, Bulacan and Zambales).

Livestock and poultry raising

About 54% of respondents raise livestock and 24% raise poultry. Among those who raise livestock, 29% raise cattle, 71% carabao, 46% hogs and 16% goats. Backyard scale (less than 5 heads) is characteristic in cattle raising with mostly (87%) 1-2 heads per respondent. Carabao raising is also commonly on backyard scale but most respondents own 3-5 heads (91%). Hog raising, on the other hand, is generally on commercial scale with 97% of respondents raising more than 10 heads (91% raise 10-15 heads). Among poultry raisers, 88% raise chicken, 25% raise duck and 7% raise other types of poultry.

Farming operations

In farming operations, 82% of respondents use hired labor, 83% use animal labor and 93% use farm machinery. About 57% of respondents utilize animals which they own, 31% rent and others borrow from neighbors and relatives. Machinery are mostly rented (62%) rather than owned (37%). Hand tractor is the commonly used farm machinery (88%). Other farm machinery also used by a few respondents include tractors (13%), harvester (13%), power tillers (5%) and others (12%).

Seed used for planting generally come from the previous harvest (74%) and seed dealers (44%). The latter are most likely sources of certified seeds. About 9% of respondents say that they received planting seed from the Government.

Most respondents use fertilizer (99%). The use of agro-chemicals is common. These usually come from dealers (89%) and the Government (6%). Although extensively used, respondents complain of high prices of fertilizer and agro-chemicals (92% and 85%, respectively). About 46% say that the use of agro-chemicals is dangerous.

Most respondents believe that the level of their inputs for production is low (82%). However, only 37% of them attribute this factor to low level of harvest. More respondents correlate the low harvest to occurrence of natural disasters (69%) and insufficient water supply for crops (58%). A significant portion of respondents also attribute it to damages caused by pests and diseases (44%). About 29% of respondents believe it is low level of farm technology that brought about the predicament.

Marketing

Respondents' agricultural products are either sold or consumed. The table below shows the distribution of respondents according to product destination (percentages taken against the total respondents producing the commodity).

	Wholesaler	Middlemen	Public Market	Consumption
Paddy	38%	46%	-	14%
Vegetables	39%	50%	48%	55%
Fruits	30%	75%	42%	30%
Livestock	3%	18%	3%	6%
Poultry	3%	12%	3%	50%

About 17% of the total paddy producing respondents sell to NFA where buying prices are subsidized by the Government (not shown in the table above). Other respondents have not yet started marketing their products (particularly livestock and poultry raisers).

About 84% of respondents experience losses in farm production. Among paddy and corn producers, the three main causes of losses are natural calamities (83%), low prices (51%) and lack of drying facilities (35%). In vegetables and fruits, main causes of losses are as specified below.

	Vegetables	Fruits
Inefficient harvest methods	24%	21%
Inefficient handling facilities	40%	30%
Lack of storage	82%	42%
Low prices	92%	79%
Poor road conditions	77%	45%
Natural calamities	74%	100%

Survey results show that in most cases, paddy and corn buying prices are determined by buyers. About 37% of respondents say that they could negotiate the price of their produce with buyers. Likewise, vegetable buying prices are also determined mostly by buyers (69%). Some 42% are able to negotiate prices. The same is true with fruits, livestock and poultry.

Respondents are generally not satisfied with the existing marketing conditions (76%). This is true in marketing of all kinds of agricultural produce (Table 4.2). In relation to this, respondents' preferred supports are shown in the table below.

	Paddy/Corn	Vegetable/Fruits	Livestock	Poultry
Post harvest facilities	55%	93%	12%	17%
Farm to market roads	46%	66%	15%	19%
Market information system	52%	100%	18%	25%
Government intervention	61%	93%	14%	27%

Among paddy and corn producers, more government intervention is expected to improve marketing conditions. Market information is recommended among others by vegetable and fruit producers and livestock and poultry raisers.

Support services

About 58% of respondents avail of credit to finance production. The remaining 42% do not avail loans mainly due to high interest rates (34%), inability to meet the requirements (20%), complicated procedures (20%) and unavailabilities of facilities (13%) (Table 4.3).

Amount of loans commonly availed is more than ₱10,000 (48%). Respondents mostly borrow from credit cooperatives (38%), PNB/LBP (27%) and informal lenders (32%). About 49% of loans from cooperatives incurred an interest rate of less than 15% while some 37% paid 16-20% interest. Loans from PNB/LBP generally cost less than 15% (68%) and 16-20% (27%). Interest rates are more liberal in informal sources ranging from no interest to exorbitant rates when borrowed from usurers. Of the respondents borrowing from informal lenders, 46% paid interest rates of less than 15% and 54% paid more than 15%. It is notable that about 37% borrow at more than 20% interest rate.

About 44% of respondents do not avail of crop insurance due to added cost it entails (21%). They have no knowledge of such a facility (15%) and believe that it is not necessary (15%).

About 74% of the total respondents are members of rural organizations in their localities. Of these respondents, 78% are members of cooperatives. A relatively small minority consist of religious groups and foundations (Egos). Most of them joined organizations to avail of cheap credit mainly to finance agricultural production (71%). Other reasons for joining include availment of better government services (57%), personal improvement (58%) and others. Others' purposes are related more to their production activities: i.e., to obtain cheaper farm inputs (43%) and better market prices of produce (38%). Other respondents do not join organizations because they think it unnecessary (31%), while others do not know their existence. Still others do not join because the organizations they know lack good reputation (12%).

About 86% of respondents are aware of the presence of government development programs in their localities. Most of them are familiar with DA (79%) and DAR (71%). A fewer respondents know about LBP (30%) and NIA (6%). About 74% of them avail of extension services offered by government and non-government workers.

Government extension workers usually visit them once a week (88%), others once a month (69%) and twice a month (41%). A smaller percentage of respondents avail extension services from non-government workers (21%). Most of these workers visit them weekly or

monthly. In both government and non-government organizations, respondents say that services are satisfactory (94% and 83%, respectively). Most of them say that services are delivered on time (80%). Some respondents do not avail extension services due to sloppy services which are caused mainly by transportation difficulties (31%) and red tape (11%).

Natural calamities

Pollution is generally not considered a problem among respondents. A very insignificant portion of respondents from Bulacan say that air pollution is getting serious. Natural calamities commonly experienced are flooding (75%) and droughts (77%) which range from slight to serious effect (Table 4.4). Provinces where more respondents suffer from serious flooding are Pampanga, Nueva Ecija and Bataan, and Nueva Ecija suffers most from droughts. Respondents were only slightly affected by the eruption of Mt. Pinatubo.

In production activities, most of respondents are beset by high prices of farm inputs (32%) and lack of farm labor (26%). Respondents from Pampanga cited lack of capital (46%) as one of the major difficulties. This closely correlates with high prices of inputs.

4.4.4 Farmers' requirements and expectations

Respondents generally prefer government subsidies on farm inputs (79%) and credit (73%) and encouragement of cooperative activities (66%) (Table 4.5). More than 50% say that provision of more appropriate infrastructure could improve their living conditions. Less than 40% of respondents put an importance on public services and employment opportunities. To respondents, moving to another place is generally not a means to improve living conditions.

Specific programs and projects cited by farmer-respondents generally fall into five categories. These are porgrams/projects related to generation of livelihood as a source of supplemental income, infrastructure facilities, technical and financial assistance and policy reforms affecting acquisition of inputs, and marketing of produce. Among the five categories, livelihood and infrastructure-related projects and programs are mostly indicated (37% each) by farmers (Table 4.6).

Among those who stated preference for infrastructure facilities, 69% specified their need for irrigation facilities and only 18% for roads. Post harvest facilities are mostly pointed out by Nueva Ecija respondents. Among those who cited alternative livelihood projects, many preferred livestock raising through dispersal programs. Financial assistance looked up to from the Government are mainly credit facilities. Although few, some respondents realized the need for reforms on policies particularly related with farm input acquisition and marketing of products.

4.4.5 Fishing conditions

Most fishermen-respondents choose fishing as a means of livelihood mainly due to their proximity to coastal areas (70%) and the lack of alternative livelihood (51%). About 32% of respondents say that fishing has a good prospect for livelihood.

Respondents from the three provinces vary in the peak and lean months for fishing due to the difference in fishing grounds they go to. Most of the Bataan respondents fish within the Country's fishing grounds (76%), Bulacan respondents within the municipality or province (48% and 36%, respectively) and Zambales respondents mostly outside the Country (34%).

About 90% of fishermen-respondents catch fish species other than those belonging to the first five species (anchovies, frigate tuna, silago whiting, goatfish and yellow and big-eyed tuna) landed in Central Luzon in terms of quantity and value. Among the five species, more respondents have been getting anchovies and silago whiting (24% and 23%, respectively). During the peak season about 56% of respondents catch less than 50 kg of fish in one month while 35% catch more than 300 kg. During lean months, more fishermen get less than 50 kg (75%) and less get over 300 kg (11%).

Respondents usually land their catch within their barangay (57%), within their municipalities (60%) and Metro Manila landing centers (58%). These are true to all the provinces. Their preferences to landing centers are due mainly to availability of buyers/traders (86%) and high market prices for their catch (86%). These reasons indicate that fishermen generally prefer to sell their catch upon landing, as fish is easily perishable.

Constraints most felt by fishermen-respondents are unfavorable weather conditions (88%), limited capital (61%) and limited capacity of gears (41%) (Table 4.7). While these problems are common to all the three provinces, Bataan respondents also encountered problems such as water pollution (66%), depleting resources (69%) and competition with big fishermen (56%). Effects of natural calamities in fishery sector is summarized in Table 4.4. According to the survey results, nearly 70% of fishermen give an answer that their fishery activities were affected seriously (8.3%) or slightly (60.3%) by the ashfalls from Mt. Pinatubo.

Generally, respondents catch fish for selling (98%). Most of them sell more than 80% of their catch (79%). Some 84% of respondents allot 10% of their catch for consumption and 42% give about 10% of their catch to relatives and friends. Only about 31% of respondents share their catch (mostly Zambales respondents). Respondents share their catch with owners of craft, crew members, operator and owner of the gear (58%, 52%, 44% and 34%, respectively of the total who have sharing arrangements).

Respondents generally trade their catch at landing sites (61%) and market places (47%). Only about 6% of respondents conduct trading while at the sea. They prefer trading at landing and market places since these places are not actually far (27% say near the fishing ground and 43% say near their residence). Some 47% of these respondents say that their catch are sold at high prices and 28% say their catch are paid in cash at landing centers. Respondents bring their catch to market due to higher buying prices (77%) and presence of more buyers (56%).

Buyers of respondents' catch are mostly wholesalers and retailers (74%). A few respondents go on direct selling to consumers (11%). In Bulacan, a different system of marketing is adopted by 32% of respondents called "konsignasyon". In this system, fishermen deliver the catch to buyers as previously arranged. Likewise, buyers in the markets are also dominated by wholesalers and retailers (78%). Most respondents prefer to sell to regular buyers (65%). Others sell to buyers due to immediate cash they can offer (34%) and accessibility/convenience (44%).

Price determination is generally influenced by three factors: supply and demand situation (76%), quality/size/kind (51%) and prevailing market price (34%). Because of the situation, marketing is very susceptible to price fluctuation which is a problem among 60% of respondents (Table 4.8). In relation to this, lack of storage and ice plants forbids them to wait for better prices. Some 33% also say that there are price manipulations in the markets (33%).

Support services

Only 26% of respondents receive extension services from the Government and non-government organizations. Most of these services are given out by the Bureau of Fisheries and Aquatic Resources of DA (93%). There are very few respondents who encountered technicians from banking institutions and municipal governments. Most respondents say that there is only one technician visiting them (68%) and the frequency of visits is once a month only (57%).

They say extension services they get is satisfactory (83%). Only a few respondents from Bataan have availed of extension services given by non-government institutions (24%). Like government technicians, they also visit once a month which made respondents say that services are not timely. Among those who do not avail of extension services, about 55% say that extension workers are choosy of who to serve while 34% are not interested. Among those who were able to avail of extension services, 74% had a problem on irregular visits of the technicians.

Relatively few respondents (39%) avail of loans to finance their fishing operations (Table 4.3). Of the total who do not avail loans, 33% say they do not have collateral, 30% say that they are discouraged by red tape and 26% say that interest rates are too high.

Of those who availed loans, 46% borrow from friends and relatives, 30% from traders, 21% from other sources and 10% from cooperatives. About 31% get interest rates of less than 5% and 35% get more than 20%. Most of those who obtained low interest rates borrowed from friends/relatives (39%) and traders (53%). Also, 47% of those who got high interest rates borrowed from friends/relatives. Borrowers from cooperatives generally avail loans at 6-15% interest rates. Those who generally borrow from informal sources said that loans are easily acquired (40% say convenient and 30% say there are less requirements) and loans have better repayment terms (25%).

A little less than half of respondents join organizations in their communities (49%). Of these respondents, 53% joined associations and 35% religious groups. Only 8% are members of cooperatives. Most of these respondents joined organizations to avail of technical assistance (53%) in their fishing activities while 31% joined to get production and marketing assistance.

4.4.6 Fishermen's requirements and expectations

Respondents generally believe that their living conditions can be improved (97%). Programs and projects cited to attain better living conditions are classified into five broad categories : generation of alternative livelihood, provision of infrastructure facilities, technical assistance, financial assistance, and enforcement of laws on sea fishing (Table 4.9).

Of these types of programs, about 49% of respondents say that financial assistance would improve their income and eventually their living conditions. This is particularly cited by most respondents from Bulacan (86%). Of the Bataan respondents, 40% believe that enforcement of fishing laws could make life better. Coastal environment is more likely a concern of the Bataan fishermen than those in Bulacan and Zambales. Also, a fewer Bataan respondents have preference for infrastructure projects.

To the question about ideas to improve living conditions, 30% of fishermen-respondents propose the government financial aid (Table 4.5). In addition, about 18% of respondents suggest to implement/promote livelihood projects, while 10% of them consider that strict implementation of law is needed for resources conservation as well as sustainable fishery management.

CHAPTER 4

TABLES

Table 4.1 Living Inconveniences

(1) Crops and Livestocks Survey Results

Suggestions / Province	Bataan		Bulacan		N. Ecija		Pampanga		Tarlac		Zambales		Total	
Low income	81	(85.3)	70	(72.9)	76	(76.0)	60	(63.8)	97	(98.0)	87	(88.8)	471	(34.2)
Poor housing	33	(34.7)	25	(26.0)	29	(29.0)	33	(35.1)	24	(24.2)	12	(12.2)	156	(11.3)
Poor infrastucture	50	(52.6)	32	(33.3)	37	(37.0)	79	(84.0)	31	(31.3)	17	(17.3)	246	(17.9)
Inadequate water supply	34	(35.8)	41	(42.7)	52	(52.0)	52	(55.3)	43	(43.4)	16	(16.3)	238	(17.3)
Poor public services	31	(32.6)	30	(31.3)	31	(31.0)	56	(59.6)	11	(11.1)	24	(24.5)	183	(13.3)
Enviiomental problems	22	(23.2)	11	(11.5)	12	(12.0)	12	(12.8)	4	(4.0)	7	(7.1)	68	(4.9)
Others	1	(1.1)	2	(2.1)	9	(9.0)	3	(3.2)	0	(0.0)	1	(1.0)	16	(1.2)
Total*	252	-	211	-	246	-	295	-	210	-	164	-	1,378	-
Total Respondents	95	(265.3)	96	(219.8)	100	(246.0)	94	(313.8)	99	(212.1)	98	(167.3)	582	(100.0)

(2) Fishery Survey Results

Suggestions / Province	Bataan		Bulacan		Zambales		Total	
Low income	91	(91.0)	68	(68.0)	96	(97.0)	255	(85.3)
Poor housing	59	(59.0)	37	(37.0)	50	(50.5)	146	(48.8)
Poor infrastucture	30	(30.0)	26	(26.0)	4	(4.0)	60	(20.1)
Indequate water supply	23	(23.0)	10	(10.0)	18	(18.2)	51	(17.1)
Poor public services	53	(53.0)	27	(27.0)	18	(18.2)	98	(32.8)
Enviiomental problems	22	(22.0)	2	(2.0)	6	(6.1)	30	(10.0)
Others	3	(3.0)	15	(15.0)	1	(1.0)	19	(6.4)
Total*	281	-	185	-	193	-	659	-
Total Respondents	100	(281.0)	100	(185.0)	99	(194.9)	299	(220.4)

Note : * Multiple answers are given.
Source : JICA-CLDP Master Plan Study Team - Agro/Socio-Economic survey in December 1993

Table 4.2 Satisfaction to Marketing Condition - Crops and Livestocks Survey

1) Palay / Corn

Satisfaction / Province	Bataan	Bulacan	N. Ecija	Pampanga	Tarlac	Zambales	Total
Yes	26 (26.5)	25 (25.5)	11 (11.0)	2 (2.1)	33 (34.0)	25 (27.5)	122 (21.0)
No	72 (73.5)	73 (74.5)	89 (89.0)	95 (97.9)	64 (66.0)	66 (72.5)	459 (79.0)
Total	98 (100.0)	98 (100.0)	100 (100.0)	97 (100.0)	97 (100.0)	91 (100.0)	581 (100.0)

2) Vegetables / Fruits

Satifaction / Province	Bataan	Bulacan	N. Ecija	Pampanga	Tarlac	Zambales	Total
Yes	5 (38.5)	1 (7.7)	2 (4.9)	4 (16.7)	0 (0.0)	15 (29.4)	27 (18.9)
No	8 (61.5)	12 (92.3)	39 (95.1)	20 (83.3)	1 (100.0)	36 (70.6)	116 (81.1)
Total	13 (100.0)	13 (100.0)	41 (100.0)	24 (100.0)	1 (100.0)	51 (100.0)	143 (100.0)

3) Cattle / Carabao

Satisfaction / Province	Bataan	Bulacan	N. Ecija	Pampanga	Tarlac	Zambales	Total
Yes	5 (45.5)	3 (11.1)	3 (10.3)	2 (4.9)	0 (0.0)	7 (28.0)	20 (13.1)
No	6 (54.5)	24 (88.9)	26 (89.7)	39 (95.1)	20 (100.0)	18 (72.0)	133 (86.9)
Total	11 (100.0)	27 (100.0)	29 (100.0)	41 (100.0)	20 (100.0)	25 (100.0)	153 (100.0)

4) Hog / Goat

Satisfaction / Province	Bataan	Bulacan	N. Ecija	Pampanga	Tarlac	Zambales	Total
Yes	3 (33.3)	2 (16.7)	4 (15.4)	1 (4.0)	0 (0.0)	5 (23.8)	15 (13.2)
No	6 (66.7)	10 (83.3)	22 (84.6)	24 (96.0)	21 (100.0)	16 (76.2)	99 (86.8)
Total	9 (100.0)	12 (100.0)	26 (100.0)	25 (100.0)	21 (100.0)	21 (100.0)	114 (100.0)

5) Chiken / Duck

Satisfaction / Province	Bataan	Bulacan	N. Ecija	Pampanga	Tarlac	Zambales	Total
Yes	4 (50.0)	1 (16.7)	4 (19.0)	1 (7.1)	0 (0.0)	6 (27.3)	16 (22.2)
No	4 (50.0)	5 (83.3)	17 (81.0)	13 (92.9)	1 (100.0)	16 (72.7)	56 (77.8)
Total	8 (100.0)	6 (100.0)	21 (100.0)	14 (100.0)	1 (100.0)	22 (100.0)	72 (100.0)

6) Others

Satisfaction / Province	Bataan	Bulacan	N. Ecija	Pampanga	Tarlac	Zambales	Total
Yes	0 (0.0)	1 (50.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (9.1)
No	0 (0.0)	1 (50.0)	1 (100.0)	5 (100.0)	0 (0.0)	3 (100.0)	10 (90.9)
Total	0 (0.0)	2 (100.0)	1 (100.0)	5 (100.0)	0 (0.0)	3 (100.0)	11 (100.0)

Source : JICA-CLDP Master Plan Study Team - Agro/Socio-Economic Survey in December 1993

Table 4.3 Utilization of Agricultural Loan

(1) Crops and Livestock Survey Results

1) Availability of Loan

Availability / Province	Bataan	Bulacan	N. Ecija	Pampanga	Tarlac	Zambales	Total
Yes	57 (57.0)	66 (66.0)	76 (76.0)	68 (68.7)	49 (49.5)	29 (29.3)	345 (57.8)
No	43 (43.0)	34 (34.0)	24 (24.0)	31 (31.3)	50 (50.5)	70 (70.7)	252 (42.2)
Total	100 (100.0)	100 (100.0)	100 (100.0)	99 (100.0)	99 (100.0)	99 (100.0)	597 (100.0)

2) Reasons for Non-use

Reasons / Province	Bataan	Bulacan	N. Ecija	Pampanga	Tarlac	Zambales	Total
High interest rates	17 (38.6)	13 (37.1)	12 (40.0)	15 (38.5)	23 (53.5)	7 (11.1)	87 (34.3)
Inability to meet requirements	9 (20.5)	7 (20.0)	9 (30.0)	12 (30.8)	4 (9.3)	10 (15.9)	51 (20.1)
Complicated procedure	7 (15.9)	12 (34.3)	4 (13.3)	8 (20.5)	10 (23.3)	11 (17.5)	52 (20.5)
Not available	3 (6.8)	1 (2.9)	2 (6.7)	1 (2.6)	1 (2.3)	24 (38.1)	32 (12.6)
Not needed	8 (18.2)	2 (5.7)	3 (10.0)	3 (7.7)	5 (11.6)	11 (17.5)	32 (12.6)
Total	44 (100.0)	35 (100.0)	30 (100.0)	39 (100.0)	43 (100.0)	63 (100.0)	254 (100.0)

3) Amount of Loan vs. Interest Rate

Amount (P) / Interest Rate (%)	≤ 5	6 - 10	11 - 15	16 - 20	≥ 20	Total
None	0	0	0	1	1	2 (0.5)
≤ 1,000	3	2	0	2	2	9 (2.3)
1,001 - ≤ 3,000	4	13	3	3	7	30 (7.8)
3,001 - ≤ 5,000	7	13	7	7	14	48 (12.4)
5,001 - ≤ 10,000	11	39	16	27	19	112 (29.0)
> 10,001	19	37	34	63	32	185 (47.9)
Total	44	104	60	103	75	386 (100.0)

4) Sources of Loan

Source / Interest Rate (%)	≤ 5	6 - 10	11 - 15	16 - 20	≥ 20	Total
Rural Bank	1	5	3	3	3	15 (3.9)
Credit Cooperatives	14	37	20	53	21	145 (37.5)
PNB / LBP	12	26	33	28	6	105 (27.1)
Commercial Bank	0	0	0	0	0	0 (0.0)
Informal Lender	17	35	4	21	45	122 (31.5)
Others	0	0	0	0	0	0 (0.0)
Total	44	103	60	105	75	387 (100.0)

(2) Fishery Survey Results

1) Availability of Loan

Availability / Province	Bataan	Bulacan	Zambales	Total
Yes	32 (32.0)	57 (58.8)	26 (26.3)	115 (38.9)
No	68 (68.0)	40 (41.2)	73 (73.7)	181 (61.1)
Total	100 (100.0)	97 (100.0)	99 (100.0)	296 (100.0)

2) Reasons for Non-use

Reasons / Province	Bataan	Bulacan	Zambales	Total
No collateral	25 (27.8)	20 (48.8)	15 (19.0)	60 (28.6)
High interest rates	26 (28.9)	10 (24.4)	12 (15.2)	48 (22.9)
Too much paper work / redtape	27 (30.0)	2 (4.9)	6 (7.6)	35 (16.7)
Not available	9 (10.0)	2 (4.9)	15 (19.0)	26 (12.4)
Not needed	3 (3.3)	7 (17.1)	31 (39.2)	41 (19.5)
Total	90 (100.0)	41 (100.0)	79 (100.0)	210 (100.0)

3) Amount of Loan vs. Interest Rate

Amount (P) / Interest Rate (%)	≤ 5	6 - 10	11- 15	16 - 20	≥ 20	Total
≤ 1,000	3	4	1	4	15	27 (25.7)
1,001 - ≤ 3,000	5	8	0	0	15	28 (26.7)
3,001 - ≤ 5,000	17	3	0	4	3	27 (25.7)
5,001 - ≤ 10,000	8	2	1	0	5	16 (15.2)
> 10,001	3	1	1	0	2	7 (6.7)
Total	36	18	3	8	40	105 (100.0)

4) Sources of Loan vs. Interest Rate

Source / Interest Rate (%)	≤ 5	6 - 10	11- 15	16 - 20	≥ 20	Total
Rural Bank	0	1	0	0	0	1 (1.0)
Commercial Banks	0	0	0	0	0	0 (0.0)
Friends / Relatives	14	2	0	2	19	37 (35.2)
Cooperatives	1	5	2	0	3	11 (10.5)
Traders / Brokers	19	7	1	0	9	36 (34.3)
Others	2	3	0	5	9	20 (19.0)
Total	36	18	3	8	40	105 (100.0)

Source : JICA-CLDP Master Plan Study Team - Agro/Socio-Economic Survey in December 1993

Table 4.4 Natural Calamities

(1) Crops and Livestock Survey Results

1) Flooding

Calamities / Province	Bataan		Bulacan		N. Ecija		Pampanga		Tarlac		Zambales		Total	
Seriously affected	34	(34.0)	21	(21.0)	35	(35.4)	39	(39.0)	18	(18.0)	4	(4.0)	151	(25.2)
Slightly affected	40	(40.0)	33	(33.0)	46	(46.5)	46	(46.0)	74	(74.0)	62	(62.0)	301	(50.3)
Not affected	26	(26.0)	46	(46.0)	18	(18.2)	15	(15.0)	8	(8.0)	34	(34.0)	147	(24.5)
Total	100	(100.0)	100	(100.0)	99	(100.0)	100	(100.0)	100	(100.0)	100	(100.0)	599	(100.0)

2) Drought

Calamities / Province	Bataan		Bulacan		N. Ecija		Pampanga		Tarlac		Zambales		Total	
Seriously affected	13	(13.0)	3	(3.0)	36	(36.4)	23	(23.0)	2	(2.0)	10	(10.0)	87	(14.5)
Slightly affected	53	(53.0)	79	(79.0)	50	(50.5)	59	(59.0)	65	(65.0)	72	(72.0)	378	(63.1)
Not affected	34	(34.0)	18	(18.0)	13	(13.1)	18	(18.0)	33	(33.0)	18	(18.0)	134	(22.4)
Total	100	(100.0)	100	(100.0)	99	(100.0)	100	(100.0)	100	(100.0)	100	(100.0)	599	(100.0)

3) Ashfall from Mt. Pinatubo

Calamities / Province	Bataan		Bulacan		N. Ecija		Pampanga		Tarlac		Zambales		Total	
Seriously affected	13	(13.0)	0	(0.0)	0	(0.0)	39	(39.0)	7	(7.0)	2	(2.0)	61	(10.2)
Slightly affected	66	(66.0)	34	(34.0)	36	(36.4)	51	(51.0)	60	(60.0)	83	(83.0)	330	(55.1)
Not affected	21	(21.0)	66	(66.0)	63	(63.6)	10	(10.0)	33	(33.0)	15	(15.0)	208	(34.7)
Total	100	(100.0)	100	(100.0)	99	(100.0)	100	(100.0)	100	(100.0)	100	(100.0)	599	(100.0)

4) Mudflow / Lahar

Calamities / Province	Bataan		Bulacan		N. Ecija		Pampanga		Tarlac		Zambales		Total	
Seriously affected	10	(10.0)	1	(1.0)	0	(0.0)	20	(20.0)	0	(0.0)	0	(0.0)	31	(5.2)
Slightly affected	8	(8.0)	6	(6.0)	1	(1.0)	28	(28.0)	20	(20.0)	6	(6.0)	69	(11.5)
Not affected	82	(82.0)	93	(93.0)	98	(99.0)	52	(52.0)	80	(80.0)	94	(94.0)	499	(83.3)
Total	100	(100.0)	100	(100.0)	99	(100.0)	100	(100.0)	100	(100.0)	100	(100.0)	599	(100.0)

5) Others

Calamities / Province	Bataan		Bulacan		N. Ecija		Pampanga		Tarlac		Zambales		Total	
Seriously affected	22	(52.4)	10	(10.0)	50	(50.5)	31	(31.0)	11	(11.0)	11	(11.0)	135	(22.5)
Slightly affected	19	(45.2)	29	(29.0)	12	(12.1)	20	(20.0)	58	(58.0)	48	(48.0)	186	(31.1)
Not affected	1	(2.4)	22	(22.0)	2	(2.0)	0	(0.0)	8	(8.0)	5	(5.0)	38	(6.3)
Total	42	(100.0)	61	(61.0)	64	(64.6)	51	(51.0)	77	(77.0)	64	(64.0)	359	(59.9)

(2) Fishery Survey Results

1) Flooding

Suggestions / Province	Bataan		Bulacan		Zambales		Total	
Seriously affected	10	(10.0)	34	(34.0)	13	(13.0)	57	(19.0)
Slightly affected	56	(56.0)	47	(47.0)	38	(38.0)	141	(47.0)
Not affected	34	(34.0)	19	(19.0)	49	(49.0)	102	(34.0)
Total	100	(100.0)	100	(100.0)	100	(100.0)	300	(100.0)

2) Drought

Suggestions / Province	Bataan		Bulacan		Zambales		Total	
Seriously affected	0	(0.0)	19	(19.0)	0	(0.0)	19	(6.3)
Slightly affected	57	(57.0)	5	(5.0)	26	(26.0)	88	(29.3)
Not affected	43	(43.0)	76	(76.0)	74	(74.0)	193	(64.3)
Total	100	(100.0)	100	(100.0)	100	(100.0)	300	(100.0)

3) Ashfall from Mt. Pinatubo

Suggestions / Province	Bataan		Bulacan		Zambales		Total	
Seriously affected	3	(3.0)	5	(5.0)	17	(17.0)	25	(8.3)
Slightly affected	66	(66.0)	52	(52.0)	63	(63.0)	181	(60.3)
Not affected	31	(31.0)	43	(43.0)	20	(20.0)	94	(31.3)
Total	100	(100.0)	100	(100.0)	100	(100.0)	300	(100.0)

4) Mudflow / Lahar

Suggestions / Province	Bataan		Bulacan		Zambales		Total	
Seriously affected	0	(0.0)	1	(1.0)	9	(9.0)	10	(3.3)
Slightly affected	33	(33.0)	41	(41.0)	11	(11.0)	85	(28.3)
Not affected	67	(67.0)	58	(58.0)	80	(80.0)	205	(68.3)
Total	100	(100.0)	100	(100.0)	100	(100.0)	300	(100.0)

5) Others

Suggestions / Province	Bataan		Bulacan		Zambales		Total	
Seriously affected	32	(40.0)	8	(34.8)	28	(31.8)	68	(35.6)
Slightly affected	46	(57.5)	15	(65.2)	53	(60.2)	114	(59.7)
Not affected	2	(2.5)	0	(0.0)	7	(8.0)	9	(4.7)
Total	80	(100.0)	23	(100.0)	88	(100.0)	191	(100.0)

Source : JICA-CLDP Master Plan Study Team - Agro/Socio-Economic Survey in December 1993

Table 4.5 Ideas to Improve Living Conditions

(1) Crops and Livestock Survey Results

Suggestions / Province	Bataan		Bulacan		N. Ecija		Pampanga		Tarlac		Zambales		Total	
Gov't subsidy on farm inputs	79	(79.0)	67	(67.0)	77	(77.8)	97	(97.0)	82	(82.0)	65	(68.4)	467	(78.6)
Gov't subsidy on farm credit	66	(66.0)	86	(86.0)	67	(67.7)	95	(95.0)	73	(73.0)	49	(51.6)	436	(73.4)
Promotion of agrarian reform	80	(80.0)	44	(44.0)	49	(49.5)	54	(54.0)	75	(75.0)	47	(49.5)	349	(58.8)
Encouraging coop activities	58	(58.0)	71	(71.0)	60	(60.6)	88	(88.0)	73	(73.0)	40	(42.1)	390	(65.7)
Provision for infrastructure	66	(66.0)	51	(51.0)	56	(56.6)	69	(69.0)	37	(37.0)	35	(36.8)	314	(52.9)
Provision of water supply	52	(52.0)	61	(61.0)	63	(63.6)	70	(70.0)	58	(58.0)	40	(42.1)	344	(57.9)
Provision of public services	49	(49.0)	32	(32.0)	37	(37.4)	61	(61.0)	8	(8.0)	29	(30.5)	216	(36.4)
New employment opportunities	20	(20.0)	76	(76.0)	33	(33.3)	58	(58.0)	34	(34.0)	39	(41.1)	260	(43.8)
Migration	1	(1.0)	3	(3.0)	0	(0.0)	0	(0.0)	0	(0.0)	4	(4.2)	8	(1.3)
Others	1	(1.0)	0	(0.0)	5	(5.1)	1	(1.0)	0	(0.0)	3	(3.2)	10	(1.7)
Total*	472	-	491	-	447	-	593	-	440	-	351	-	2,794	-
Total Respondents	100	(472.0)	100	(491.0)	99	(451.5)	100	(593.0)	100	(440.0)	95	(369.5)	594	(470.4)

(2) Fishery Survey Results

Suggestions / Province	Bataan		Bulacan		Zambales		Total	
Govt to extend financial aid	36	(22.6)	63	(43.4)	36	(25.0)	135	(30.1)
Livelihood projects	47	(29.6)	15	(10.3)	18	(12.5)	80	(17.9)
Strict implementation of law	34	(21.4)	1	(0.7)	11	(7.6)	46	(10.3)
Resettle petrochem residents	1	(0.6)	0	(0.0)	0	(0.0)	1	(0.2)
Infrastructure / road	4	(2.5)	5	(3.4)	4	(2.8)	13	(2.9)
Cooperative development	4	(2.5)	14	(9.7)	18	(12.5)	36	(8.0)
Water system	10	(6.3)	3	(2.1)	1	(0.7)	14	(3.1)
Electricity	4	(2.5)	18	(12.4)	0	(0.0)	22	(4.9)
Fishing equipment	2	(1.3)	18	(12.4)	15	(10.4)	35	(7.8)
Technology on fishing	17	(10.7)	8	(5.5)	17	(11.8)	42	(9.4)
Others	0	(0.0)	0	(0.0)	24	(16.7)	24	(5.4)
Total	159	-	145	-	144	-	448	-
Total Respondents	100	(100.0)	100	(100.0)	100	(100.0)	300	(100.0)

Note : * Multiple answers are given.
Source : JICA-CLDP Master Plan Study Team - Agro/Socio-Economic Survey in December 1993

Table 4.6 Farmers' Needs and Requirements

(1) For Improvement of Living Conditions

Programs	Bataan		Bulacan		N. Ecija		Pampanga		Tarlac		Zambales		Total	
Alternative livelihood	30	(30.0)	46	(46.0)	51	(51.0)	21	(21.0)	57	(57.0)	18	(18.0)	223	(37.2)
Infrastructure	21	(21.0)	50	(50.0)	47	(47.0)	23	(23.0)	42	(42.0)	39	(39.0)	222	(37.0)
Technical assistance	30	(30.0)	6	(6.0)	2	(2.0)	40	(40.0)	1	(1.0)	5	(5.0)	84	(14.0)
Financial assistance	10	(10.0)	13	(13.0)	7	(7.0)	35	(35.0)	3	(3.0)	16	(16.0)	84	(14.0)
Policy reforms	5	(5.0)	7	(7.0)	4	(4.0)	4	(4.0)	0	(0.0)	2	(2.0)	22	(3.7)
Total*	96	-	122	-	111	-	123	-	103	-	80	-	635	-
Total Respondents	100	(100.0)	100	(122.0)	100	(111.0)	100	(123.0)	100	(103.0)	100	(80.0)	600	(105.8)

(2) Infrastructure Projects Indicated by the Farmers

Programs	Bataan		Bulacan		N. Ecija		Pampanga		Tarlac		Zambales		Total	
Roads	4	(19.0)	13	(26.0)	1	(2.1)	0	(0.0)	19	(45.2)	2	(5.1)	39	(17.6)
Irrigation facilities	8	(38.1)	22	(44.0)	30	(63.8)	6	(26.1)	20	(47.6)	29	(74.4)	115	(51.8)
Total*	12	-	35	-	31	-	6	-	39	-	31	-	154	-
Total for infrastructure	21	(57.1)	50	(70.0)	47	(66.0)	23	(26.1)	42	(92.9)	39	(79.5)	222	(69.4)

Note : * Multiple answers are given.
Source : JICA-CLDP Master Plan Study Team - Agro/Socio-Economic Survey in December 1993

Table 4.7 Problems Usually Encountered

Reasons	Bataan		Bulacan		Zambales		Total	
Unfavorable weather	98	(98.0)	69	(70.4)	96	(97.0)	263	(88.6)
Limited capital	66	(66.0)	48	(49.0)	69	(69.7)	183	(61.6)
Water pollution	65	(65.0)	23	(23.5)	2	(2.0)	90	(30.3)
Depleting fish supply	69	(69.0)	26	(26.5)	15	(15.2)	110	(37.0)
Presence of big fisheermen	56	(56.0)	17	(17.3)	22	(22.2)	95	(32.0)
Limited capacity of fishing gear	59	(59.0)	39	(39.8)	26	(26.3)	124	(41.8)
High operating cost	46	(46.0)	9	(9.2)	19	(19.2)	74	(24.9)
Government restrictions	0	(0.0)	1	(1.0)	8	(8.1)	9	(3.0)
Total*	459	-	232	-	257	-	948	-
Total Respondents	100	(459.0)	98	(236.7)	99	(259.6)	297	(319.2)

Note : * Multiple answers are given.
Source : JICA-CLDP Master Plan Study Team - Agro/Socio-Economic Survey in December 1993

Table 4.8 Problems Encountered in Marketing of Catch

Problems	Bataan		Bulacan		Zambales		Total	
Fluctuation of prices	75	(79.8)	75	(81.5)	57	(59.4)	207	(73.4)
Lack of storage	45	(47.9)	1	(1.1)	35	(36.5)	81	(28.7)
Lack of ice plant	7	(7.4)	3	(3.3)	24	(25.0)	34	(12.1)
Lack of transport facilities	21	(22.3)	9	(9.8)	21	(21.9)	51	(18.1)
Limited capital	46	(48.9)	9	(9.8)	40	(41.7)	95	(33.7)
Price manipulation	55	(58.5)	19	(20.7)	24	(25.0)	98	(34.8)
Few market outlets	0	(0.0)	0	(0.0)	5	(5.2)	5	(1.8)
High operation cost	33	(35.1)	4	(4.3)	8	(8.3)	45	(16.0)
Lack of processing facilities	0	(0.0)	0	(0.0)	6	(6.3)	6	(2.1)
Others	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Total*	282	-	120	-	220	-	622	-
Total Respondents	94	(300.0)	92	(130.4)	96	(222.9)	282	(218.4)

Note : * Multiple answers are given.
Source : JICA-CLDP Master Plan Study Team - Agro/Socio-Economic Survey in December 1993

Table 4.9 Fisherfolks' Needs and Requirements for Improvement of Living Conditions

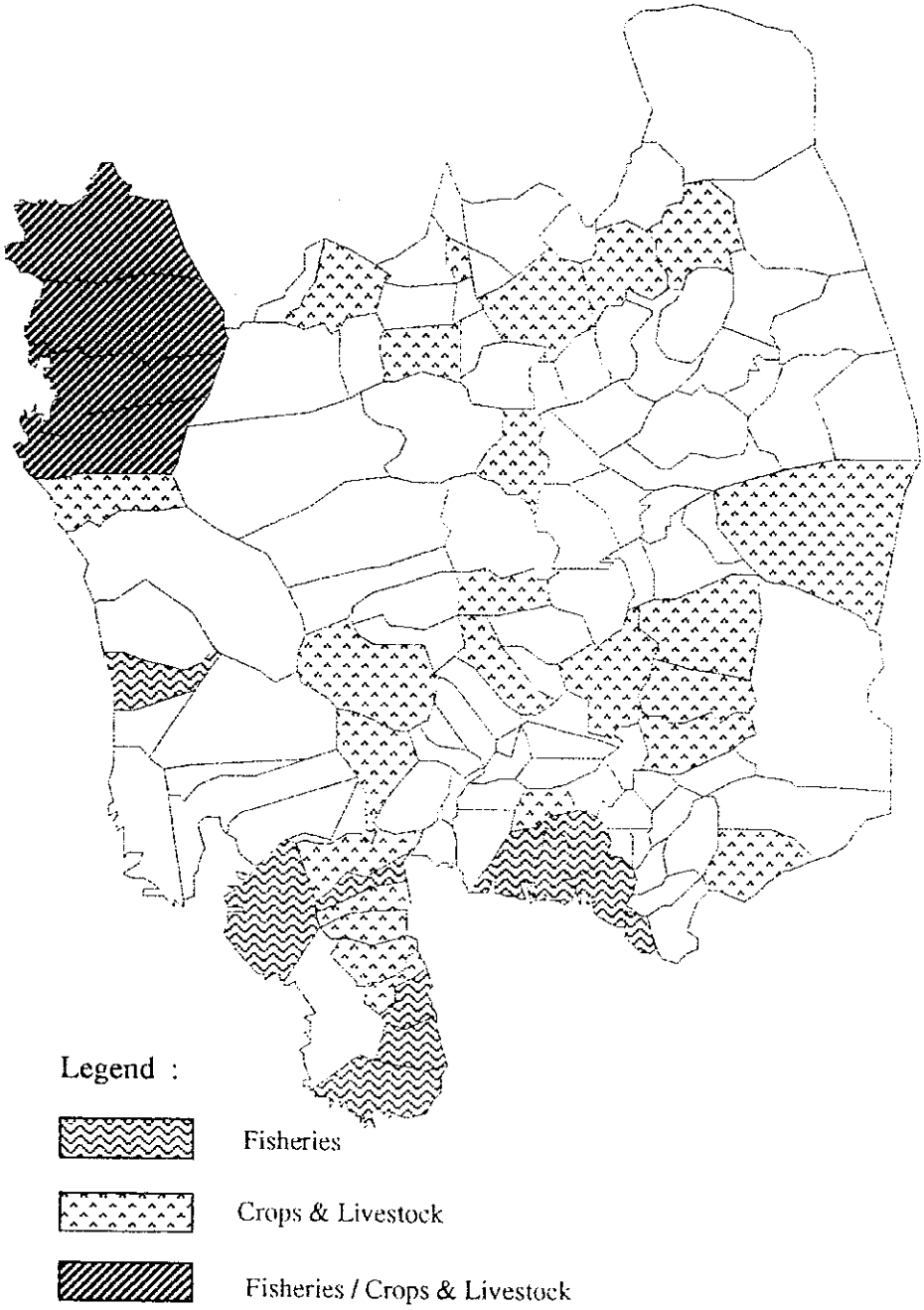
Programs	Bataan		Bulacan		Zambales		Total	
Alternative livelihood	30	(31.6)	3	(3.8)	17	(21.3)	50	(19.7)
Infrastructure	7	(7.4)	20	(25.3)	19	(23.8)	46	(18.1)
Technical assistance	20	(21.1)	11	(13.9)	17	(21.3)	48	(18.9)
Financial assistance	32	(33.7)	68	(86.1)	24	(30.0)	124	(48.8)
Law enforcement	38	(40.0)	1	(1.3)	4	(5.0)	43	(16.9)
Total*	127	-	103	-	81	-	311	-
Total Respondents	95	(133.7)	79	(130.4)	80	(101.3)	254	(122.4)

Note : * Multiple answers are given.
Source : JICA-CLDP Master Plan Study Team - Agro/Socio-Economic Survey in December 1993

CHAPTER 4

FIGURES

Figure 4.1 Sampling Areas for Agro/Socio-Economic Survey



CHAPTER 5

CHAPTER 5 RURAL AND AGRICULTURAL DEVELOPMENT PLAN

5.1 Objectives and Development Framework

5.1.1 Objectives

In support for the "Philippines 2000", the objectives of rural and agricultural development plan for Central Luzon have been established. They are:

(1) To increase production to support food and feed sufficiency in the region and contribute to other region's requirements;

(2) To improve farmers' and fisherfolks' incomes by enhancing agricultural productivity and expanding raw materials base for processing in rural areas;

(3) To generate sufficient employment opportunities in rural areas to minimize out-migration and social disruption;

(4) To contribute to the diversification of region's economy and biosphere; and

(5) To improve the quality of life and welfare of the rural populace.

5.1.2 Agricultural development framework

Agriculture development for the Central Luzon regional development shall be carried out in the context of increased production volume and value added and sustainability. This incorporates ideas about more environmentally and socially sensitive approaches to agriculture which imply a number of features about ecology and society that go beyond the limit of the agricultural field.

Thus, social factors including marketing and pricing mechanisms and land tenure relationships would be as important as droughts, pest outbreaks or soil degradation. Also, results of the interplay between social and economic factors generate a particular agricultural ecosystem by which decisions that allocate energy and material inputs are important factors of sustainability.

The development framework in agriculture is anchored in the three alternative scenarios examined for the CLDP Master Plan: Globalization, Localization and Glocalization. The globalization scenario is based on the maximum utilization of industrial/trade anchors mainly for export-oriented, labor-intensive industries. Among these industries, agro-based production will be promoted. To support this, Central Luzon may be specialized in a few selected crops other than rice and traditional crops. A shift towards readily exportable and

processed crops would likely be encouraged. This would be coupled by a commercial scale operation in agricultural production.

The localization scenario is a community-based development scenario. Improvement in agriculture value added shall be carried out through crop diversification by small farmers. Mixed and integrated farming shall be emphasized. Since production may be shifted to vegetables and fruits, organization of farmers for marketing and integration may be more beneficial. These forms of farming may also expand the base for a range of rural industries for simple processing. In both ways, small farmers can earn extra income, while staying in rural areas.

The glocalization scenario combines advantages of the first two alternatives while minimizing adverse social and environmental effects. Crop diversification would be emphasized for those crops that can be processed within the region into final products and those that would supply Metro Manila and export markets. This scenario represents the development paradigm for Central Luzon.

Crop diversification towards high value added crops as well as improved and diversified use of all commodities is important in all the scenarios. The agri-based industry sector which transforms raw agricultural products into finished products will play key roles in all the scenarios. Some possible crops for cultivation in lahar affected areas may also be identified.

Figure 5.1 schematically shows the background and the conceptual development framework for the rural and agricultural sector by topographical zone in Central Luzon.

In totality, the proposed agricultural development framework consist of four components defining the basic strategy needed to address the problems identified in the present agricultural condition in the region : extensification, intensification, conservation and rehabilitation. These are described separately in the following.

5.2 Basic Strategy

There are four components in the basic strategy for agricultural development in Central Luzon: extensification, intensification, conservation and rehabilitation. Extensification means the optimum utilization of available land resources. This is achieved through expansion of agricultural area, evolution of appropriate cropping patterns and multi-story cropping.

Intensification is basically improvement of produce in both volume and quality. This goes along with the goal to increase value of agriculture outputs. This is achieved through diversification, enhanced utilization of inputs such as fertilizer, good quality planting materials and agro-chemicals.

Conservation refers to preservation of soil and water resources which support the sustainability of agricultural activities while adding to production value. The dwindling supply of water and degradation of soil quality are twin effects of man's destructive activities and lack of concern for conservation. Conservation strategy will consist of measures as agro-forestry in the upland, construction of waterway structures and adoption of regulatory laws.

Rehabilitation covers areas affected by the Mt. Pinatubo eruption. This strategy includes classification of areas according to the degree of damages. Land areas which could not be salvaged from the devastation should be left out while concentrating on areas that could still be rehabilitated. Rehabilitation areas also cover denuded forest and mangrove areas.

5.2.1 Extensification

There is a need to shift from a commodity based approach to a farming systems approach that will enable farmers, especially numerous small rice and sugar farmers to diversify produce to high income elasticity crops. Thus, this strategy considers the best use of the land and land use allocation in determining the region's development directions and interventions that will be implemented along this direction.

The term of extensification is generally used in a land use matter. This refers to the optimum utilization of agricultural land. In the 1992 land use data compiled by BSWM, agricultural land use shares 35.4 % of the total land area of Central Luzon or 644,475 ha. However, using the analysis of the region's land capability based on the existing land management units (LMUs) and pedo-ecological zones, land area suited to agriculture production could expand to as much as 955,000 ha.

Under this plan, land areas are classified according to crop suitability, although the soil structure of the region is relatively homogenous (i.e., suitable to a variety of crops). The lowlands are proposed for irrigated and rainfed paddies and a variety of temporary crops such as vegetables, pulses and corn. The upland areas are proposed for multi-story cropping which would hold two or more crops in the same area. The idea is to be able to utilize the land at its optimum capacity and tree crops to share the fertilizer for temporary crops. Thus, planting temporary crops between spaces of tree crops of similar nutrient requirements could double the benefit. This, in turn, gives added value to tree crop production.

Production forest areas are allocated for fruit tree crops and timber production. This shall constitute a large portion of the forest area in the region. This serves dual purposes: forest cover, and food and timber production.

Marginal areas for agricultural production may be allocated for managed pasture. This strategy is expected to increase production value of agriculture due to the higher value of

cattle livestock compared to tree crop products. This is particularly true under the globalization and glocalization scenarios. In the localization scenario, these marginal areas are seen as multi-cropping areas or other land uses since large animal production is mainly expected under backyard raising.

The proposed agricultural land use varies in the three scenarios as each espouses different means in attaining economic growth. The table below shows the proposed land use in the localization, globalization and glocalization scenarios. Geographic distribution of proposed land use is given in Volume VI: Sector Report 4 for Environment and Land Husbandry.

Proposed Land Use in Three Scenarios

(Unit: 1,000 ha)

	Localization	Globalization	Glocalization
Lowland Prime Lands			
Irrigated Paddy	284	281	281
Mixed Farming	199	0	117
Diversified Crops	67	0	65
Commercial Crops	0	265	82
Upland Prime Lands			
Multi-Story Farming	92	96	96
Managed Pasture	0	84	85
Moderate/Marginal Uplands			
Multi-Story Farming	88	0	0
Production Forests			
Tree Crops/ Agro-Forestry	223	223	223

Source : JICA Team

Land utilization in the three scenarios is based on the strategy of better land management for increased value added in agriculture. Better land management is viewed in the context of appropriateness of land use through analysis of potentials. Land use in the three scenarios basically differ in crop areas due to varying development concepts.

Localization strategy is backed by diversification to high value crops such as vegetables, rootcrops and fruits that are readily tradable in local or Metro Manila markets. Globalization strategy emphasizes commercial and industrial crops to support agro-industrialization in the region. Important crops would be cashew, coffee, cacao and peanuts in addition to the traditional industrial crops such as sugarcane. Corn would also be an important crop to augment production of livestock and poultry. Glocalization strategy combines the first two taking the best attribute of each. Thus, this has a good mix of industrial as well as readily tradable high value crops.

All the three scenarios share the same features in the irrigated paddy areas, production forest areas and diversified prime upland for tree crops. Irrigated paddy areas are maintained at more or less 281,000 ha. Production forest areas and prime uplands are the same as soil and water conservation and environmental concerns are emphasized in all the scenarios along with food and timber production.

The utilization of identified key production areas shall be an important part of the extensification strategy. These specific areas shall be devoted to corresponding suitable crops to maximize advantage. The key production area approach augurs well for the region's quest for enhanced production volume and value added in agriculture.

5.2.2 Intensification

Crops

Intensification is also called the vertical expansion in agriculture development. With the limitations imposed by the size of land area, intensification is the only strategy that could increase production and consequently, increase value added in agriculture production. This strategy shall be carried out in line with the Government's "key production area" strategy of increasing production. In this program, the Government integrates all assistance such as technology in production and postharvest, material inputs and marketing for production of specific commodity in a potential area. Thus, all appropriate supports are provided in order to encourage production increase.

In crop production, intensification means optimum utilization of fertilizer and high yielding varieties and consolidation of other inputs and support services, coupled with technology and modern farm practices. Among others, timing of planting activities such as transplanting and fertilizer application is consequential in improving production of rice. Production of fruits and vegetables shall be undertaken through the development of high yielding varieties. The use of good seed and seedlings shall be proliferated through the furtherance of the Bureau of Plant Industry's (BPI) capability to monitor the production of certified seeds and seedlings. Production of certified seed shall be practiced largely by the private sector.

Fishery

The declining volume of fish landed in Central Luzon (and in fact, in the whole Country) is attributed mainly to the concentration of both small and commercial fishers in overfished municipal waters while offshore areas remain untapped. Local commercial fishers (small fishermen in particular) lack the ability to modernize fishing technology and gears due to lack of financial resources. Like the crop sub-sector, fishery has very little access to affordable credit due to the inherent risk attached to it. Thus, the key to increased production in marine fishing is to enable the fishermen to go offshore through provision of modern and efficient

equipment and gears through an easy acquisition program. Small fishermen should be given the same opportunity as commercial fishermen through a cooperative undertaking.

Also, marine fishery production in the region is largely determined by location of landing facilities that would facilitate trading and marketing. Thus, the establishment of one would greatly enhance fish production in the region since local fishermen, both commercial and municipal, would be encouraged to land in the nearest areas rather than going to other landing centers.

Production in fisheries would be augmented by propagation of aquaculture in the sea, inland waters and fishponds through improved technology and inputs. While no expansion of fishponds are considered in the plan, intensification of production in aquaculture shall be carried out through increase of stocking rates of fry/fingerlings.

Livestock and poultry

Livestock and poultry production shall be intensified through increased participation of small farmers in backyard raising. This shall be undertaken through importation of breeders and development of stocks. Due to land tenure problems associated with Pasture Lease Agreements, commercial operations shall be mostly fattening in confinement such as feedlotting. Commercial breeding farms shall be encouraged to enter into contract-growing with farmers (individually or cooperatives).

This scheme will reduce investment requirements of commercial scale operators for land and labor and assure them of steady supply of ready-to-slaughter animals while small farmers are assured of feeder animals and ready market. Dispersal of large animals for fattening shall be expanded by the Government with private stock farms. To encourage the participation of these private stock farms, they shall be covered by an incentive program such as zero tariff for importation of cattle breeders. In order to answer the immediate demand for beef in the region, cattle fattening shall be backed by importation of fatteners from other countries.

Cattle, swine and poultry production shall be supported by corn production in the region. With the perennial problem of scarcity in feed supply, corn feed shall be increased from 100% deficit to 34% sufficiency level (localization scenario) and shall be augmented by other auxiliary feeds such as crop residues. Since, feed supply from within the region shall remain deficient in the next 15 years, cattle, swine and poultry production shall be supported by feed supply from nearby regions. Along this line, the Government shall promote market assistance and information services such as forward selling agreements between corn producers and corn users.

5.2.3 Conservation

There are two areas that need to be taken care of in order to substantially support the agriculture and fishery industry. These are forest areas which are crucial in the conservation of soil and water resources and mangrove forests which are the spawning areas of fish. The proposed land use plan for the region designated 377,000 ha of protection forests. These consist of watershed areas, national parks and other forests deemed critical for conservation purposes.

The designated forest areas are mostly denuded and are mostly grassland. The most commercially valuable forests are old growth dipterocarp forests dominated by various hardwood species loosely classed as Philippine mahogany. However, they are dwindling rapidly.

The total forest area with dipterocarp vegetation in Central Luzon is only 177,000 ha, 24% of which are old growth and 76% residual. This includes the areas at the former Naval Reservation of the USA in Bataan and Zambales. These areas and other remaining forests are reserved for conservation. In order to conserve the remaining forest resources, government and non-government entities should take a tougher stance on the implementation of policies regarding protection of both forests and mangrove areas.

Mangrove forests are decreasing due mainly to conversion to fishponds. Originally, mangrove forests lost due to fishpond operations are found along the coastal areas of Pampanga and Bulacan and a few areas in Zambales. At present, there exist a total of 100 ha of mangrove forests in the region which should be given immediate conservation attention.

The protection and rehabilitation of watershed areas which are vital for the continued agricultural productivity in lowlands should be ensured through the implementation of community-managed integrated forestry program with sloping agriculture land technology. Essential conditions are organizing of tribal communities and other sectors and total prevention of logging activities in the areas aiming at the eventual management of the resources by the communities themselves.

These measures should be supported by concerted efforts by the private sector as well as the Government. An advocacy for a firm government hand on the implementation of total log ban in the region's watershed areas should be complemented by networking and linkaging with NGOs, student organizations and church-based groups to support the protection and rehabilitation efforts and campaigning among a broad majority of the population on watershed area protection and regeneration.

5.2.4 Rehabilitation

In a series of events which occurred since the June 1991 eruption, the watersheds and major river basins which drained Mt. Pinatubo have been completely altered from their pre-eruption conditions. Most of these former river channels and low lying adjoining areas are now buried by pyroclastic deposits, ranging from meters to tens of meters in depth. In most reaches of these river basins, surface water flow during the long dry season is now minimal or non-existent, in stark contrast to the pre-eruption years when many of these same rivers served as important sources for local irrigation systems and supported a sustenance level of traditional fisheries.

The river basins affected by lahar flows were formerly vast tracts of agricultural lands. These covered a total of 77,275 ha as of 1993 and are forecast to expand in the next series of eruptions and due to their aftermathes. The same crops may not be grown in these areas, but other crops may suit better. Areas with thick deposits of ashfall and lahar could still be utilized after rehabilitation. This needs a new thrust on research which should take on the right crops to plant, fertilizer use and farming practices adopted to rehabilitated areas.

Denuded forest areas, particularly portions of watersheds of important river systems, are areas for reforestation proposed in the land use plan. These areas are intended to be restored to dipterocarp forests. The Government may directly undertake replanting activities or it may enter into co-production, joint venture or production sharing agreements with the private sector such as corporations or associations. Also, some upland areas are proposed for agro-forestry. Land owners covered in such areas shall be encouraged to plant tree crops to augment reforestation in denuded watershed areas.

The Sloping Agricultural Land Technology (SALT) which was started by a church-based NGO in Mindanao is an alley cropping system which could provide short-term subsistence and long term cash income. It has a positive environmental impact as it reduces soil erosion and increases agriculture benefit as it replenishes soil nitrogen. In addition, reforestation projects should include selection of appropriate species such as fast-growing and fertility-restoring leguminous trees. Intercropping with tree crops and minor forest products such as rattan would also enhance the impact of reforestation programs.

For the next 15 years, the total log ban policy shall be strictly enforced in Central Luzon. Thus, there will be no timber production except for auxiliary products such as rattan. Forest production activities will consist of propagation and replanting of fast growing and hardwood species of trees.

While maintaining a sustained supply of fishery food products, regeneration and sustained management of aquatic resources should be undertaken by the Government. Activities should include rehabilitation of fishery resources for the next 15 years.

5.2.5 Measures to undertake development

Since agricultural production in Central Luzon is dominated by small-scale farmers, the ultimate objective is the development of these farmers through the transformation of their production practices into market-driven ones that can adjust, at minimal costs, to changing local and international markets and technological conditions. Implementing a new land use plan means getting farmers to plant new crops. Convincing them to do so entails two factors : 1) there is an easily adoptable technology and 2) there is good market for the produce.

(1) Production technology and assistance

Research and extension

Agricultural research should focus on high value crops that can be integrated in the present farming system of the region. Multi-story farming, mixed farming and integrated farming should be given a priority. Possible combinations of crops that could be grown in the same area should be developed. The purpose of R&D is ultimately to produce appropriate site-specific technology for diversification through multi-story farming, mixed farming and integrated farming.

Research and extension efforts should also be directed towards utilization of ashfall and lahar affected areas. This requires the intensive application of soil test kit under he DA's program on soil suitability analysis to aid farmers in deciding what crops to raise. There are areas, however, that need focused researches including areas with thick deposits of lahar.

In fisheries, research shall focus on increased production in aquaculture. Areas of research shall include stocking density of cultured fry and combination of species that can be raised in the same pond at the same time.

It is also important that researches include quality control, timeliness of harvesting, processing techniques and marketing strategy to improve crop competitiveness in the market. If the region's fresh agriculture products should be competitive in the international market, excellent product handling and packaging should be incorporated in the development of postharvest technology that should be adopted. This increases production cost but should be necessarily pursued due to growing requirements for quality standards of consumers.

Production credit facility and input subsidies

Producing new crops entails additional production expenses. There is a need to create a special on-lending program for the production of new crops. In order to further encourage planting new crops and in large production volume, the Government should provide subsidies on inputs such as fertilizers, seed and machinery.

Credit facilities may not necessarily mean additional government funds for direct lending. Instead funds could be infused in the guarantee fund of the Government to enhance the credit worthiness in the agriculture sector. The participation of the private sector in rural credit could be encouraged if the guarantee program is expanded.

Alternative financial delivery systems should be created to meet capital requirements of new crop production (including enhancement of production), mobilizing NGOs, POs and middle sector resources toward the formation of a private development bank to serve farmers. Such a bank will eventually be transferred to farmers themselves. Moreover, the proliferation of rural banks particularly cooperative-based ones can provide more credit opportunities in rural areas due to availability of funds. Rural banks plow savings of the people back to the community in contrast to commercial banks which more often siphon cash from rural areas to urban areas.

Production and distribution of quality seed and seedlings

This entails strengthening of the BPI functions on seed certification, seed quarantine (in case of imported seed and seedlings) and seed multiplication monitoring. The Government should undertake a seed multiplication program which could either be undertaken by BPI itself or through accreditation of privately-owned seed farms.

With the private sector participating in seed production, the BPI capability to monitor and certify the quality of planting materials should be enhanced. In the similar manner, BPI should also be equipped with knowledge and equipment to guarantine imported planting materials.

Public information and promotion

A program package should be developed for public information and promotion to create awareness among farmers. Particularly, information dissemination of government programs should be extensive reaching farmers even in the most remote areas. This would entail prudent use of mass media.

Infrastructure

Upgrading of irrigation systems in lowlands along with the development of new areas for irrigation is still wanting in the region. The region has a total irrigation development ratio of 59%. Development of communal-sized irrigation systems prove to be multi-beneficial in the

farming community. Small water impounding dams are necessary to solve the problem of water shortages for growing crops in uplands and rainfed areas. This creates a twin effect of controlling disastrous erosions in uplands and floods in lowlands as well.

Acceleration of CARP implementation and development of ARCs

The distribution of lands through the CARP has been dragging. After about six years of implementation, only about 46% of the program's target has been realized. This centerpiece program of the previous administration has been overshadowed by other programs under the new dispensation. However, the truth still remains that land reform holds the key to the growth of rural economies. Time after time it will be repeated that improvement of land tenure would not only enhance land utilization but also improve the economic status of farming tenants and lessees. The comprehensive approach to this land tenure improvement necessitates the development of agrarian reform communities (ARCs) to facilitate and consolidate support services of the program and assistance from NGOs and other entities. This ensures a more cost-effective implementation of the program with more grasp of impact to the beneficiaries and the community.

(2) Marketing

Provision of postharvest technology and facilities

Among the paddy postharvest facilities, dryers are most deficient. The deficiency can be addressed through a post harvest facility acquisition program where the Government taps the private sector to mass produce NAPHIRE designs and loan out to cooperatives on an installment basis.

The program on crop diversification would necessitate different types of storage and warehouses. Compared to rice, most vegetables and fruits are easily perishable. Provision for this by the Government may be channeled through cooperatives. The private sector could be better invited in this endeavor.

Creation of market linkages

The growing market for high value crops in both local and international markets would not benefit small farmers unless they have proper connection and linkages with the market mainstream. In this endeavor, cooperative development holds a key. A cooperative of farmer-producers may be given technical assistance via training on how to penetrate markets such as local retail and export. Cooperatives can also enter into contract growing for supply of raw materials to agro-industries.

The Government can play an active role in accessing, documenting and disseminating at the local level information on world and local market trade, and potentials for high-value crops.

There are a variety of income-generating productive activities which small farmers can diversify into if provided with sufficient information and access to these outlets.

With the private sector participation, the Government can embark on market information systems and aggressively promote Philippine agricultural commodities in foreign markets, negotiating for fairer trade relationships with these markets and designing institutional linkage arrangements between multi-national corporations and farmers' cooperatives through projects such as joint-ventures, land lease arrangements and contract groups. Studies on group farming, contract growing and other schemes involving participation and cooperation of a large number of farmers should be aggressively pursued with the end view of expanding their potentials for formal tie ups with local and foreign agri-business entities.

Targeting on foreign markets, the best assistance the Government can give to producers is to straighten up trade policies. The Government should pursue more deregulated policies which transcend beyond the limits of protectionism and plunge into a more competitive world market and take a careful consideration of international agreements on trade being formulated for purposes of mutual trade interests among participating countries. Expected to affect the Philippine agriculture industry significantly are GATT, APEC, AFTA and other multi-lateral agreements. Aside from direct impacts such as volumes of products traded, the participation of the Philippines in these international trade agreements would place the Country in a dynamic environment which would spur development in the countryside.

Provision of trading centers, price information and farmers' participation

Agricultural production is characterized by a large number of small producers who are often at the disadvantaged position in marketing due to a variety of setbacks, one of which is the lack of farmgate price information. Trading centers coupled with price information system would certainly improve the bargaining position of these small producers. These facilities would allow exchange of information between and among trading centers within and outside the region.

Also, existing market conditions in favor of traders and landlords can be described as an income leakage from primary producers-farmers to traders. This system which has been perpetrated for a long time can be corrected by establishing alternative trading and marketing organizations starting from the barangay level and consolidated at the district towards the provincial level. This should be geared towards gradually gaining control of at least 25% of the region's total agricultural production by farmers.

Development and strengthening of farmers' organizations.

While Central Luzon has relatively well-organized institutions for farmers and fishermen, they have not yet saved the plight of farmers significantly. In most cases, these organizations

(e.g. cooperatives) are used only as channels of government and NGO assistance, mostly credit assistance. While many organizations have proven worthiness, there are also a number that failed and were not sustained for various reasons. More frequently, organizations die down due to lack of correct perception about goals of the organization and lack of management skills. Still the enormous potential of farmers and fishermen's institutions to pursue development in rural areas remain indisputable. With the continuing value re-orientation and training for the rural folks, institutionalization would finally stand up for its worth.

5.3 Agricultural Development Potentials and Targets

(1) Food production and sufficiency level

In all the three scenarios, Central Luzon is expected to be more than self-sufficient in food crops (Tables 5.1 and 5.2). The region shall continue to be the rice bowl of the Philippines with 19% to 59% production surplus, depending on the scenarios. With a crop intensity of 200% in irrigated areas and 100% in rainfed paddy areas and an average yield of 5.0 tons/ha, the region is expected to achieve an annual growth rate of 1.96% to 3.45% in paddy production. Leading provinces that would contribute largely to the surplus production are Nueva Ecija, Bulacan and Pampanga.

Vegetable crops represented by okra, squash, watermelon, onion, asparagus, mungbean, tomato and eggplant shall have an annual production growth rate of 4.2% to 7.1%. This performance shall bring the region's sufficiency level to about 121% to 208% by the year 2010. This surplus means the region's potential for export to other regions and international markets. These targets shall be realized with increased yields which are within the range of the region's potential.

Fruits and nuts are represented by mango, banana, papaya, peanut and cashew in the projection. Production shall grow at an annual rate of 16% to 18%. Mango which is an important product in the region shall increase its production at 6.8% to 7.6% per annum. This performance will lead to 110% surplus in the region by the year 2010 which could be brought to local or international markets.

Meat supply shall be less than the expected demand due to the limitation posed by land areas not favorable to commercial raising particularly of cattle. However, cattle production is expected to have an annual increase in the next 15 years at 2.8% to 5.7%, has production at 2.5% to 4.5% and poultry production at 3.5% to 5.9%, respectively. This shall create a meat sufficiency level of 50% to 80% by the year 2010, improved from the present 45% self-sufficiency. Fish supply shall be supported mainly by production in aquaculture (85%). Marine and inland fishery shall contribute a meager 15% of the total supply. Sufficiency

level in fish shall be from 93% to a surplus condition of 118%, a significant improvement from the present level of 73%.

Corn production shall be intended for food and feed consumption. Production growth rates shall be rather high particularly in the globalization and the glocalization scenarios to support production of cattle, swine and poultry. Annual growth rates in corn shall range from 10.4% to 14.2%. Despite this increase, however, the demand for corn cannot be met by the region's production alone. While production shall meet food demand by 100%, it can only attain 7% to 34% sufficiency level in feed requirement .

(2) Economic growth

According to the Philippines 2000, the GRDP of Luzon is expected to grow at 8.5% per annum from 1993 to 1998, higher than the national growth target of 7.4%. Agriculture may grow at 3.97% to 4.51% per annum, higher than the national target of 4.0%. Among the three alternative scenarios, the highest GVA growth rate shall be attained in the glocalization scenario posting an average of 4.51% annually from 1990 to 2010. Localization and globalization shall attain growth at 4.30% and 3.97% in the same period, respectively.

(3) Export earnings / savings

Surpluses in crop production are expected to generate additional income for the region. Selected crops have export potentials in both domestic and international markets. A variety of exportable crops in fresh and processed forms are as follows.

Crop	Unprocessed	Processed
Tomato		*
Peanuts		*
Asparagus	*	
Ginger	*	*
Cassava	*	*
Mango	*	*
Cashew		*
Sugarcane		*
Coffee		*
Cacao		

(4) Support for agro-industrialization

Under the three scenarios, agriculture production shall be consistent with the development of agro-industrialization. Agro-industrialization is expected to increase the value added of agricultural products through manufacturing of food and non-food products with crop-base

raw materials. The traditional sugar industry and processing of paddy will be complemented by other processing plants particularly to utilize production of fruits, nuts and rootcrops. The increased production of cassava would justify the manufacturing of flour, modified starch and other products. The introduction of coffee, cacao and cashew production in the region would develop more manufacturing initiatives due to availability and abundance of raw materials.

(5) Employment generation

Economic activities in the agriculture sector are expected to increase the value of services and eventually increase employment. The gross value added in agriculture services is expected to grow at 4.30%, 4.51% and 3.97% in the localization, the glocalization and the globalization scenarios, respectively. Employment is expected to grow correspondingly. Demand for labor in production would increase primarily due to expansion of planted area. In addition, the establishment of processing plants would expand labor demand more dramatically.

5.4 Development Projects

5.4.1 Project formulation and development programs / projects

Based on the basic strategy presented above, a set of projects or programs have been formulated to attain the development targets set in subsection 5.2.1. Table 5.3 shows the framework of project selection in rural and agricultural sector by sub-sector.

Core projects and programs identified in each sub-sector are listed below. A profile of each project/program is contained in Volume VIII: Project Report.

(1) Crop production

(Rehabilitation of irrigation system)

1) Angat Afterbay Regulator Dam Rehabilitation
2) Mapanuepe River Lake Irrigation
3) Porac-Gumain River Irrigation System Restoration

(New irrigation systems)

4) Balintingon Reservoir Multipurpose Development
5) Pampanga Delta Development Project - Irrigation Component
6) Upper Tabuating River Irrigation
7) North Lawis (Palongahon) Irrigation
8) Communal Irrigation Development
9) Tarlac Satellite Irrigation

(Others)

10) Small Water Impounding Projects (SWIPs)
11) Small Reservoir Irrigation Projects (SRIPs)
12) Integrated Upland Farming System Development
13) Pilot Pump Irrigation
14) Postharvest Operations Nucleus Development
15) Tropical Plants Multiplication and Distribution
16) Citrus Intercropping Pilot Development
17) Integrated Organic Farming Promotion
18) Seri-Culture Promotion

(2) Livestock production

1) Crop - Livestock Integrated Farming
2) Backyard Animal Production Enhancement Program
3) Carabao-Based Dairy Development

(3) Fishery production

1) Provincial Tilapia Hatchery
2) Fishery Common Service Facilities Establishment
3) Grouper Cage Culture
4) Luzon Sea Coastal Resources Management

(4) Forestry production

1) Holistic Catchment Management Program
2) Rattan and Bamboo Plantations Development and Management

(5) Agro-industry / livelihood

1) Hermosa Agro-Industrial Estate
2) Countryside Agro-Industrial Centers (CAICs) Development
3) Micro and Small Enterprises Livelihood Systems Development
4) People's Postharvest and Trading Facilities
5) Local Resource and Agri-Based Rural Industries Establishment
6) Regional Herbal Processing Plant

(6) Institutional and capability building

1) Regional Agricultural Training and Extension Center
2) Regional Cooperatives Development and Training Institute
3) Resource Center for People's Participation in Local Governance and Development
4) Computerization of LGU Data Base

5) Land Resources Information System Development
6) Popular Leadership and Entrepreneurship Training

(7) Finance and crop insurance
1) Provincial Cooperative Savings and Loan Association

(8) Integrated area, inter-sector and rural development
1) Muñoz Agro-Science Community-Quiquepartite Networking
2) Rural Database Development
3) Rural Roads Development and Management
4) Rural Energy Program
5) Rural Water Supply and Sanitation Improvement
6) Agrarian Reform Communities Livelihood and Cooperative Development
7) Community-Based Resettlement and Livelihood Development

5.4.2 Institutional and operational arrangements for implementation of the CLDP programs / projects

To implement and successfully manage the proposed development projects and programs, it is essential to set up an integrated or closely inter-linked tie-up supporting system among all agencies and institutions concerned including the national government agencies (NGAs), local government units (LGUs at provincial, municipal and barangay levels), NGOs and people's organizations. Figures 5.2 and 5.3 show the proposed set-up for rural and agricultural development in Central Luzon and the operational framework for implementing the CLDP programs / projects, respectively.

CHAPTER 5

TABLES

Table 5.1 Projected Food and Feed Supply and Demand

Particular	1990 Position	Localization	Glocalization	Globalization
2010 Population ('000)	6,191	10,499	10,499	10,499
Mean per capita consumption for Region III (kg/year)				
Rice & Other Products	119	119	119	119
Vegetables	47	47	47	47
Rootcrops	5	5	5	5
Corn & Other Products	6	6	6	6
Fruits	39	39	39	39
Meat	21	21	21	21
Fish	33	33	33	33
Production (Supply) [MT]				
Rice (milled)	1,146,558	2,257,800	2,009,400	1,689,600
(unmilled)	1,910,930	3,763,000	3,349,000	2,816,000
Vegetable	112,037	314,885	442,370	254,270
Rootcrops	42,511	378,230	337,720	512,000
Corn (Food)	17,304	104,990	104,990	104,990
Fruit	124,869	932,075	991,690	821,900
Meat	59,111	29,276,741	46,750,273	43,828,151
Fish	150,256	409,107	321,781	321,781
Corn Feed	0	23,600	146,725	87,800
Demand [MT]				
Rice (milled)	736,729	1,249,381	1,249,381	1,249,381
(unmilled)	1,409,420	2,439,787	2,400,457	2,349,822
Vegetable	290,977	493,453	493,453	493,453
Rootcrops	30,955	52,495	52,495	52,495
Corn (Food)	61,910	104,990	104,990	104,990
Fruit	278,087	470,985	470,985	470,985
Meat	130,011	220,479	220,479	220,479
Fish	204,303	346,467	346,467	346,467
Corn Feed	193,875	335,545	508,111	260,647
Sufficiency Level				
Rice	135%	154%	139%	119%
Vegetable	38%	64%	90%	51%
Rootcrops	137%	721%	643%	975%
Corn (Food)	28%	100%	100%	100%
Fruit	45%	198%	210%	174%
Meat	45%	50%	80%	75%
Fish	73%	118%	93%	93%
Corn Feed	0%	7%	29%	33%

Note : Base year of projection - 1990

Source: JICA-CLDP Masterplan Study Team

Table 5.2 Growth Rates in Agriculture Value Added and Production Volumes in Three Scenarios

Particular	Localization	Glocalization	Globalization
GVA Growth Rate	4.30	4.51	3.97
Production Growth Rate			
Rice	3.45	2.85	1.96
Corn	10.39	14.24	12.71
Vegetable	5.30	7.11	4.24
Roots and Tubers	11.55	10.92	12.40
Banana	9.01	9.46	8.60
Mango	6.80	7.34	7.57
Fruits and Nuts	18.38	18.56	16.27
Sugarcane	0.12	-0.79	-0.79
Coffee	23.72	19.07	15.79
Cattle & Other Lives	2.79	5.65	5.31
Hog	2.51	4.53	4.19
Poultry	3.47	5.93	5.59
Marine/Inland Fishe	1.70	0.63	0.63
Aquaculture	6.06	4.77	4.77

Source: JICA-CLDP Masterplan Study Team