

Fig. H.3.2 PROPOSED CORN SEED DISTRIBUTION SYSTEM

Planning & Monitoring
of Seed Production/
Distribution

Research, Varietal
Development &
Breeding

Multiplication
of Foundation
Seed

Multiplication of
Registered &
Certified Seed

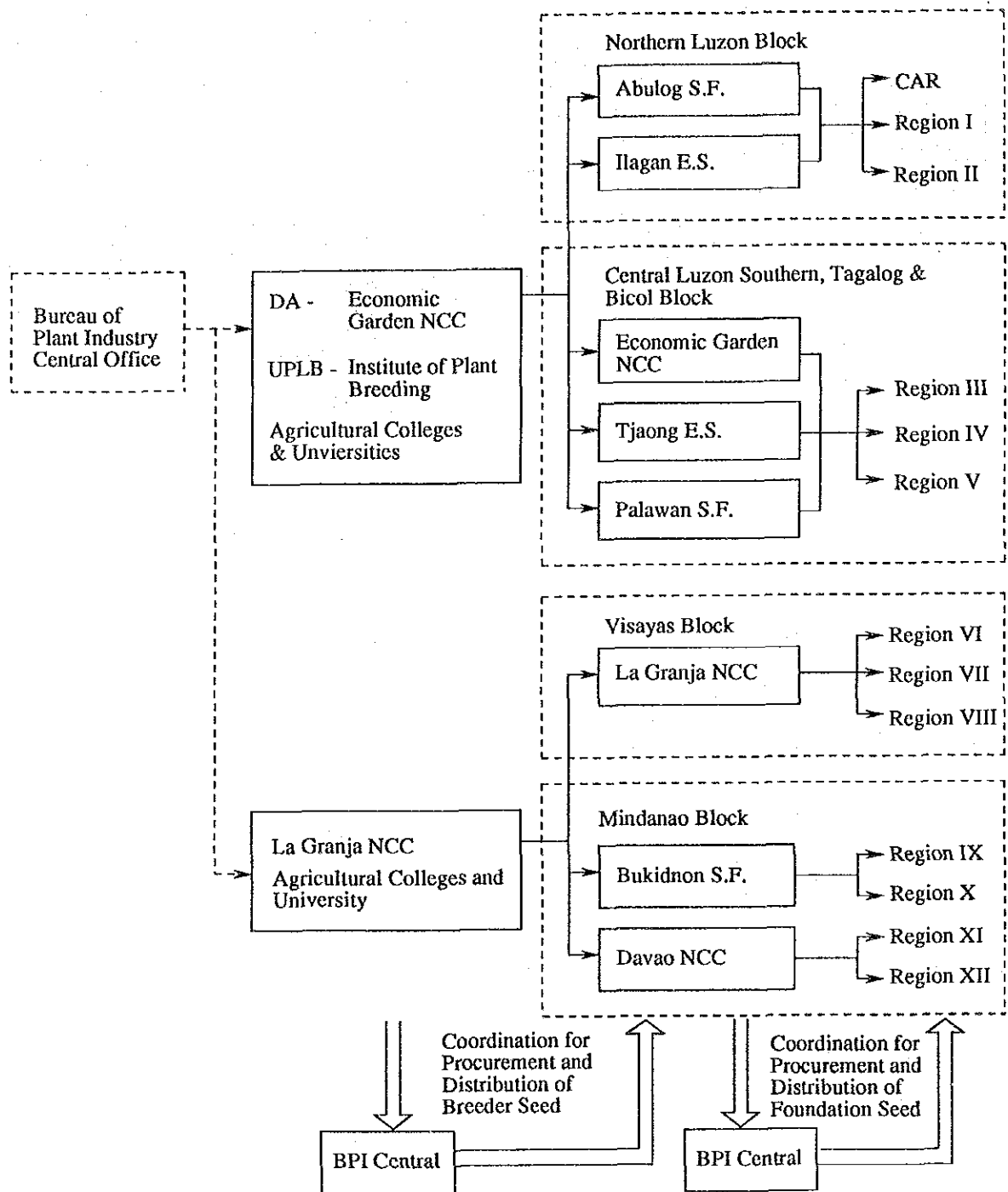


Fig. H.3.3 PROPOSED PEANUT SEED DISTRIBUTION SYSTEM

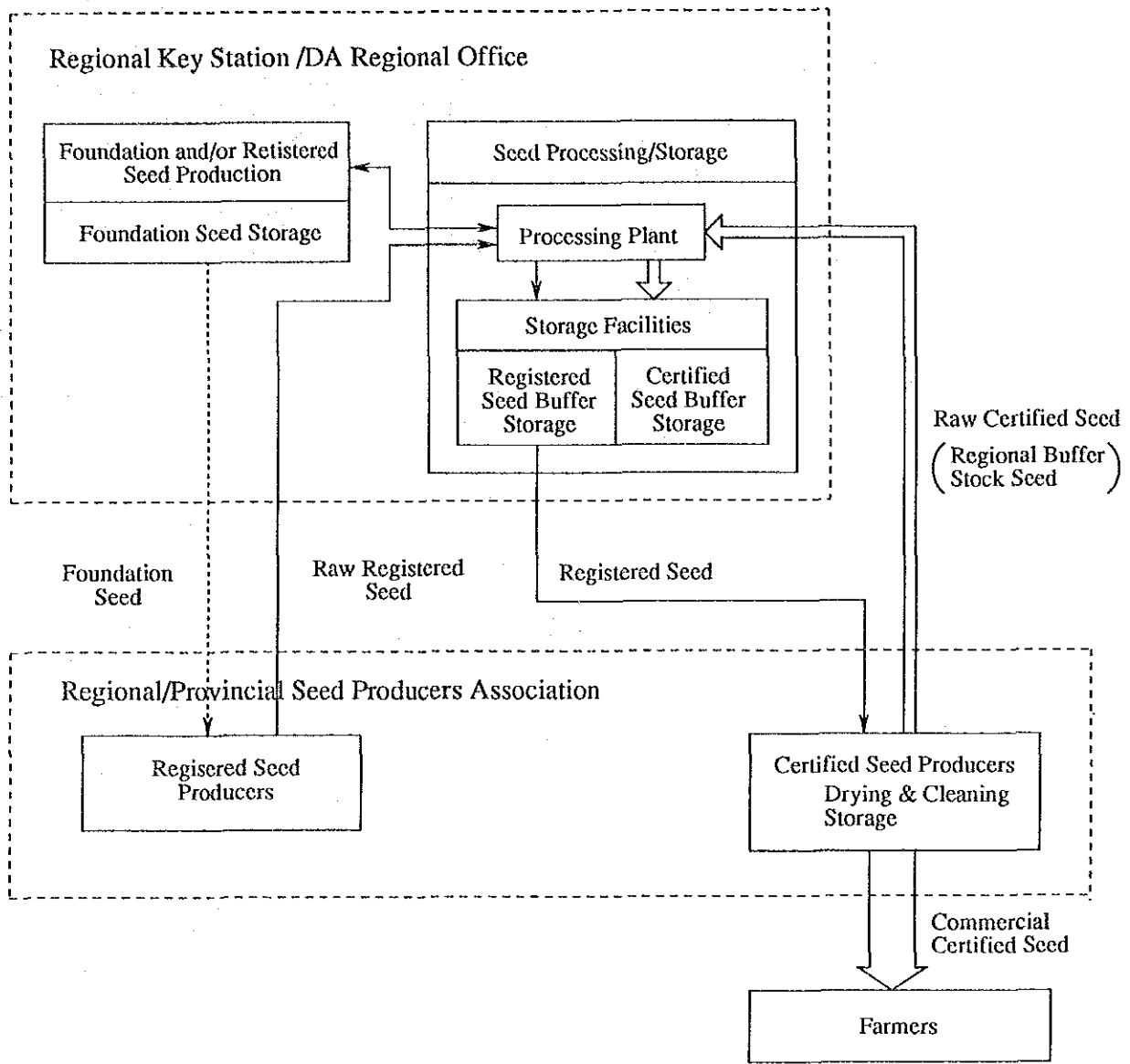


Fig. H.3.4 PROPOSED REGIONAL SEED PROCUREMENT, STORAGE AND DISTRIBUTION SYSTEM

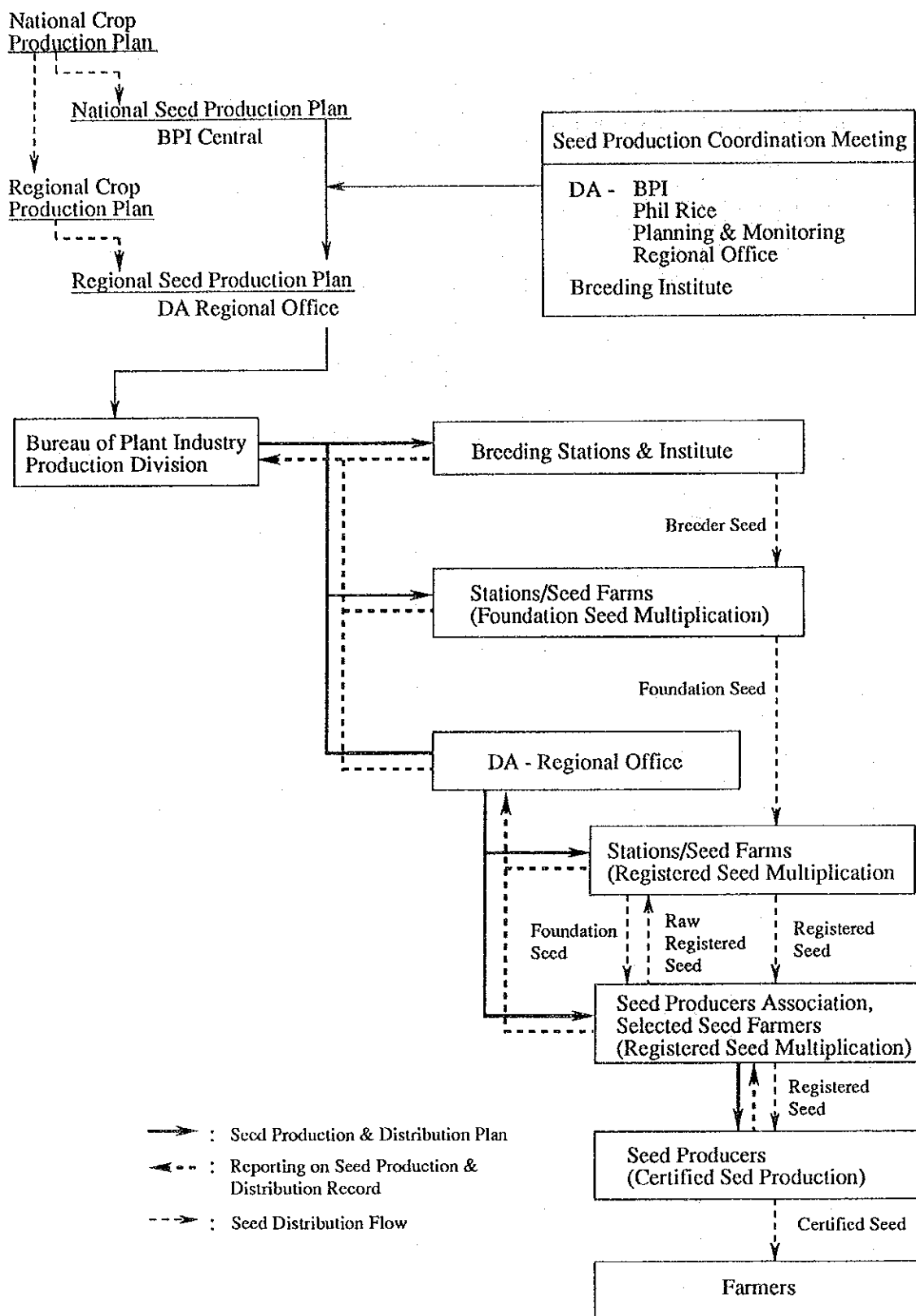


Fig. H.3.5 PROPOSED PLANNING AND MONITORING SYSTEM FOR SEED PRODUCTION AND DISTRIBUTION

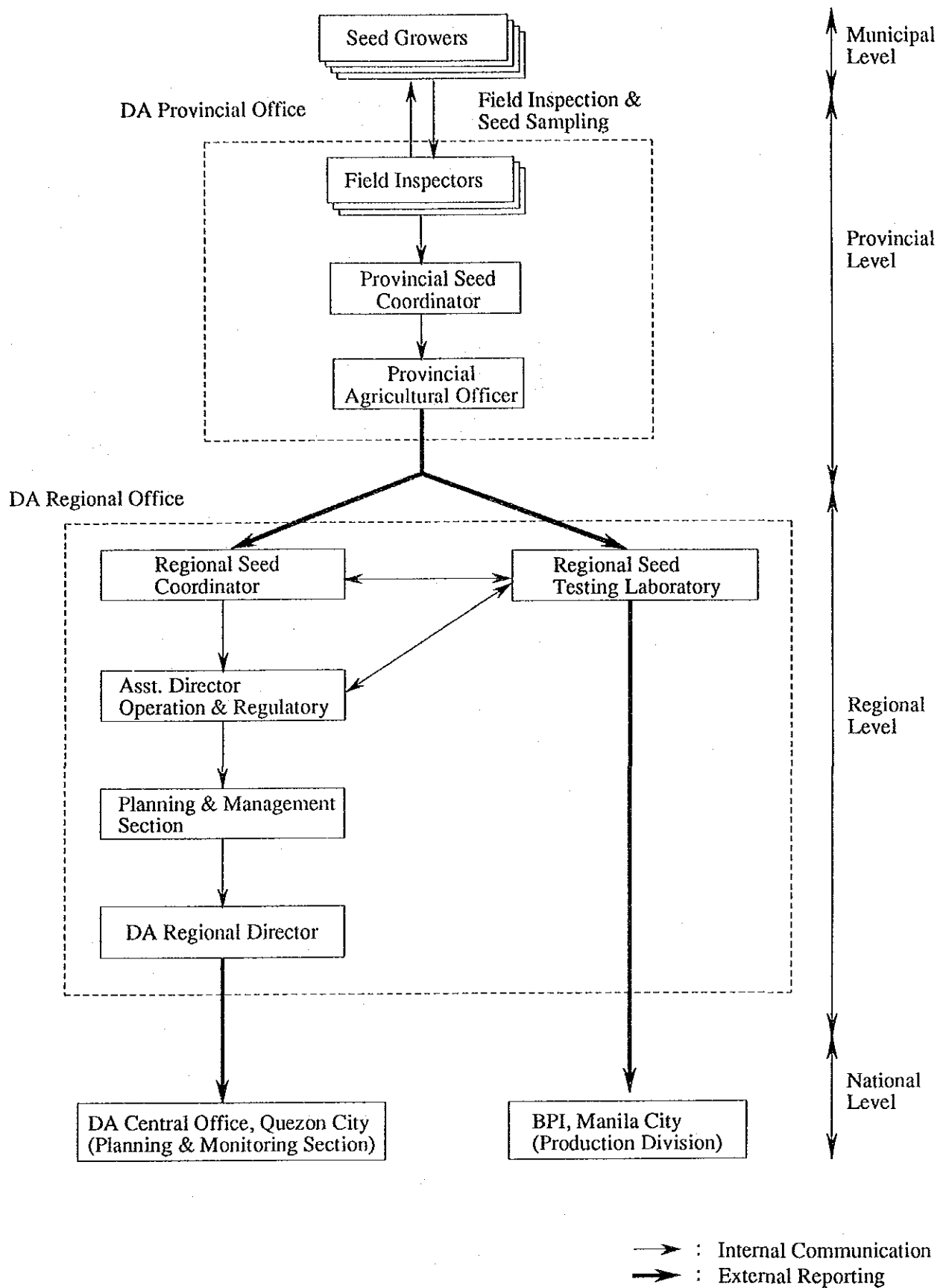


Fig. H.4.1 PRESENT MONITORING SYSTEM ON SEED PRODUCTION AND DISTRIBUTION IN THE MODEL AREAS

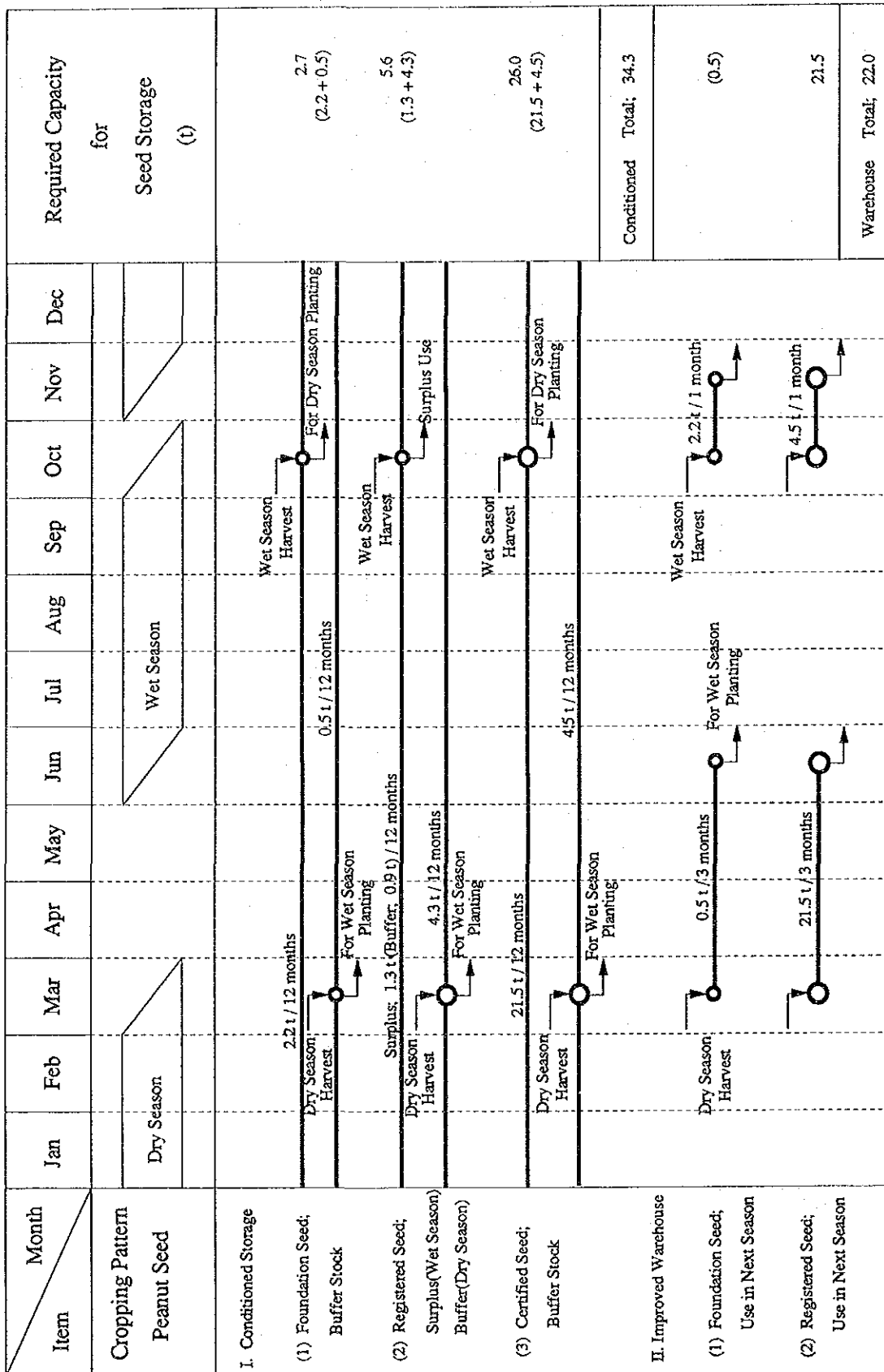


Fig. H.5.1 REQUIRED PEANUT SEED STORAGE CAPACITY IN IILIGAN EXPERIMENT STATION

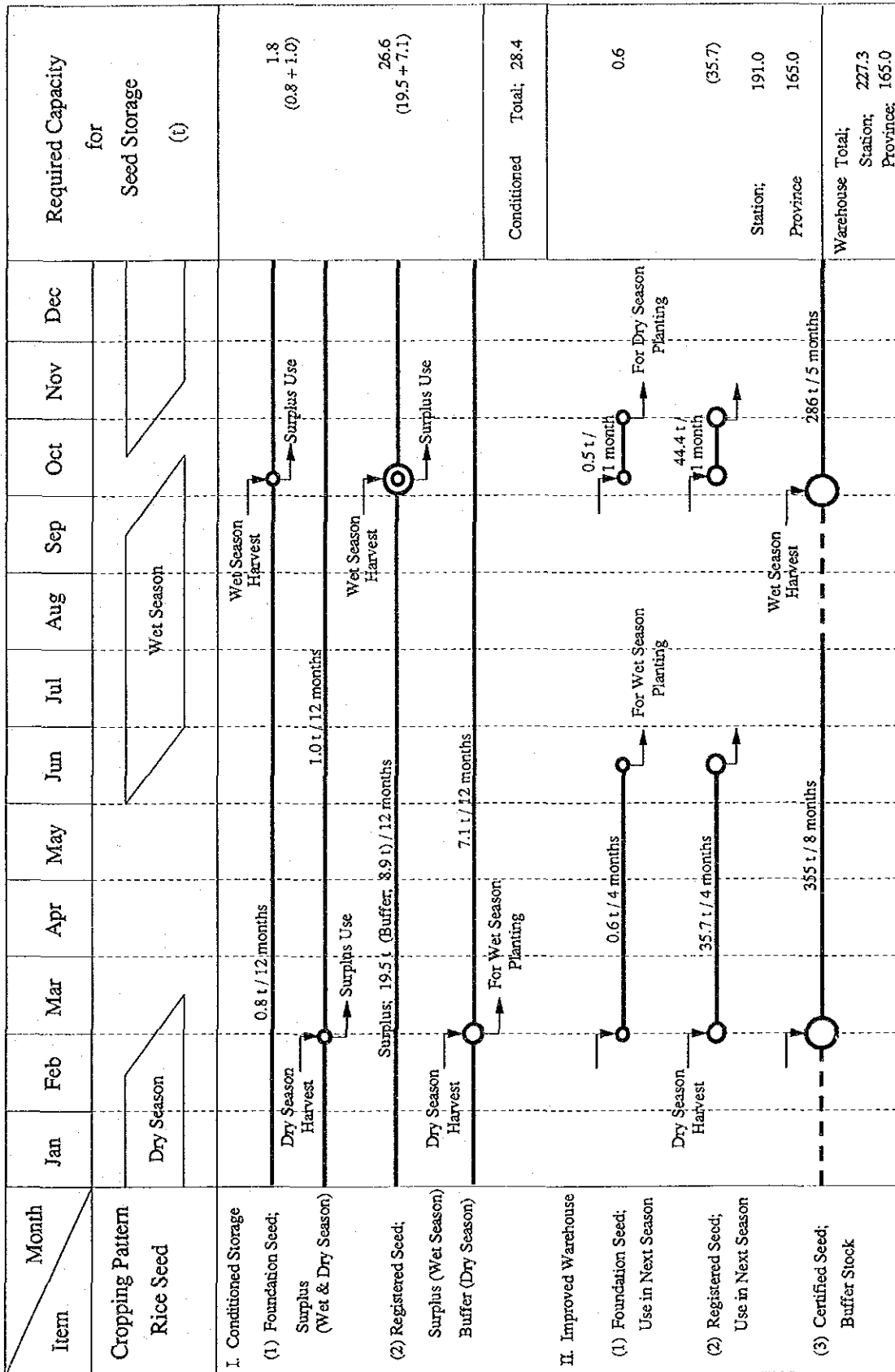


Fig. H-5.2 REQUIRED RICE SEED STORAGE CAPACITY IN VISAYAS EXPERIMENT STATION

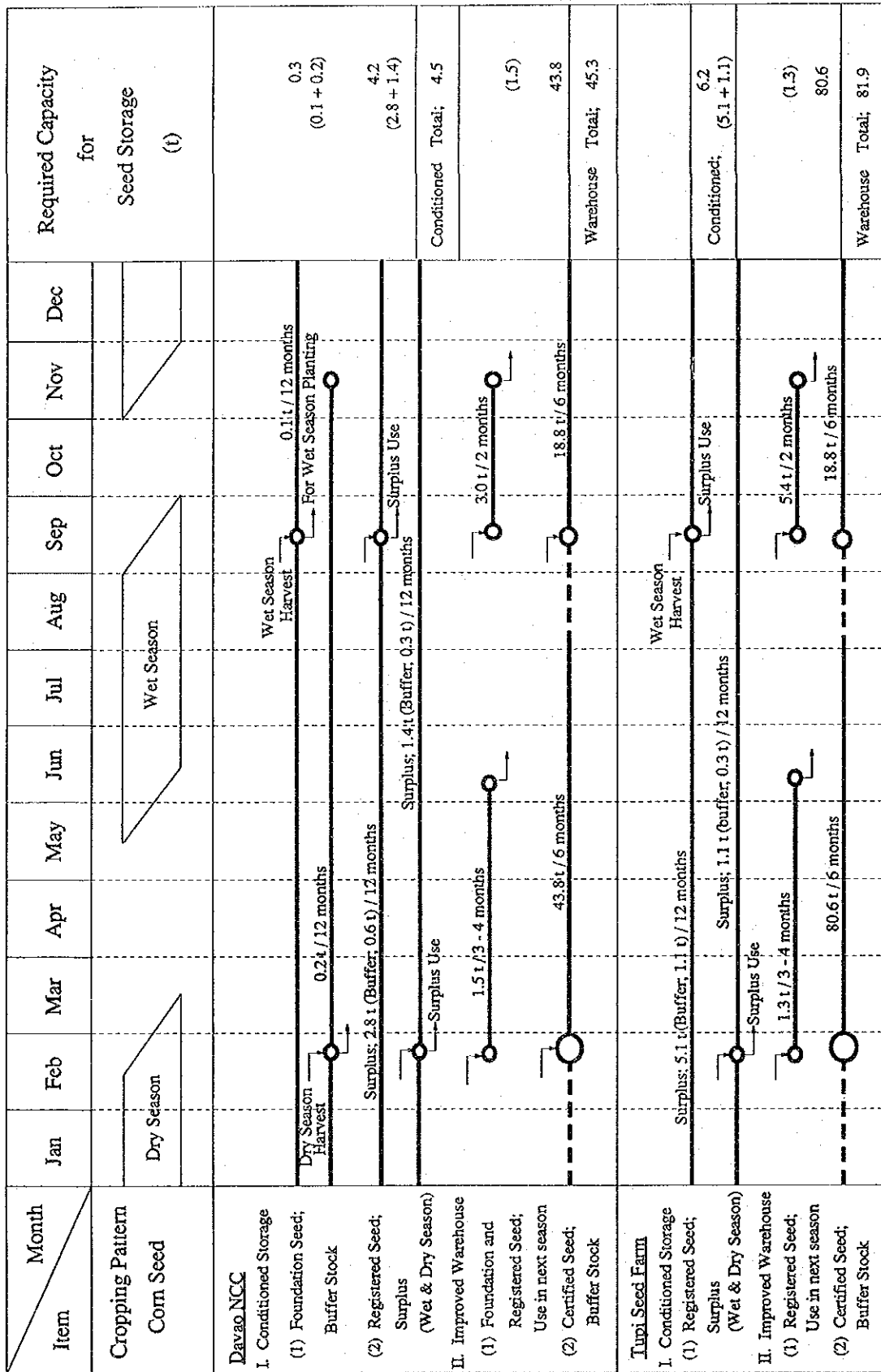


Fig. H.5.3 REQUIRED CORN SEED STORAGE CAPACITY IN DAVAO NCC AND TUPI SEED FARM

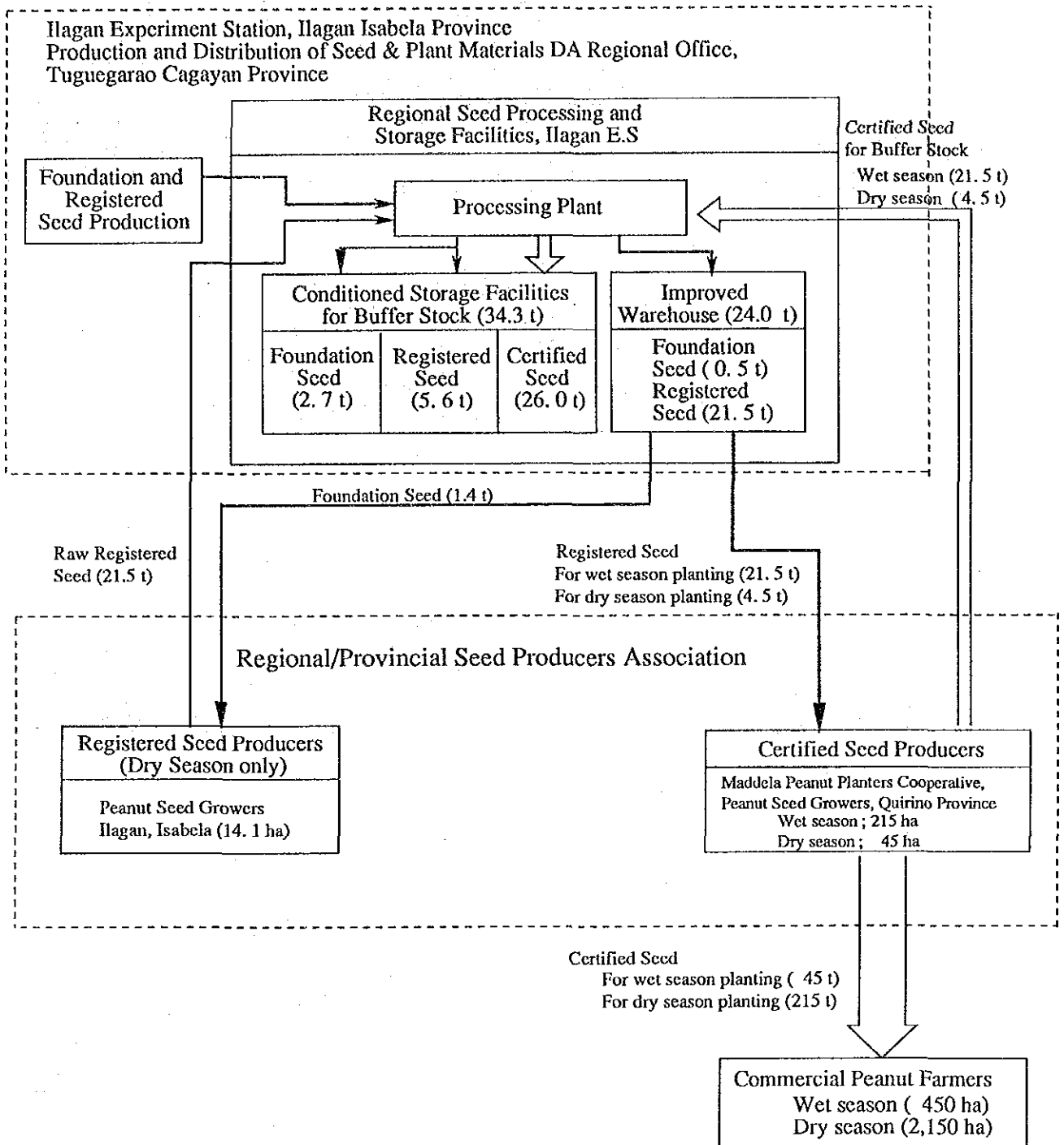


Fig. H.5.4 PROPOSED PEANUT SEED PRODUCTION AND DISTRIBUTION PLAN IN REGION II

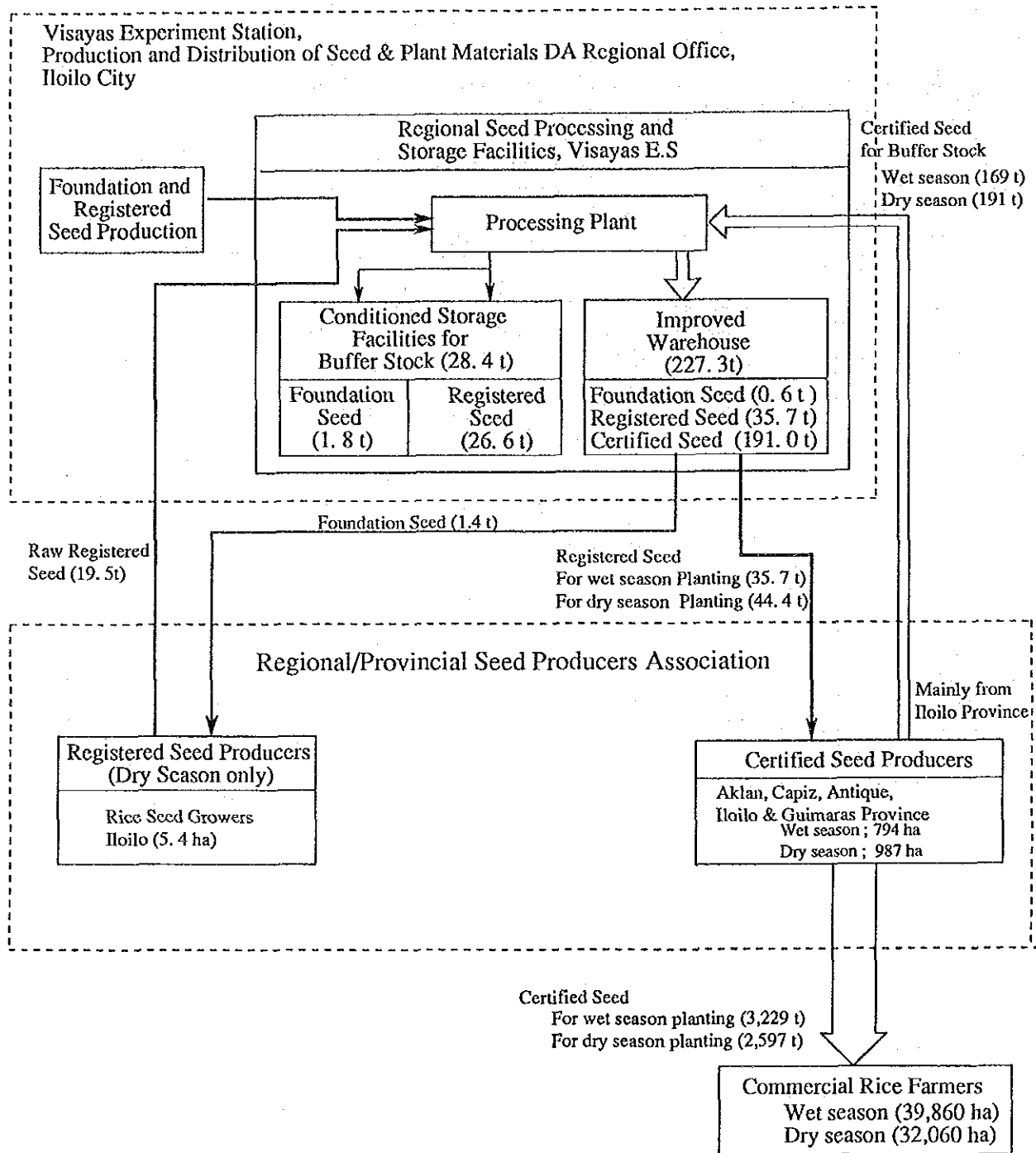
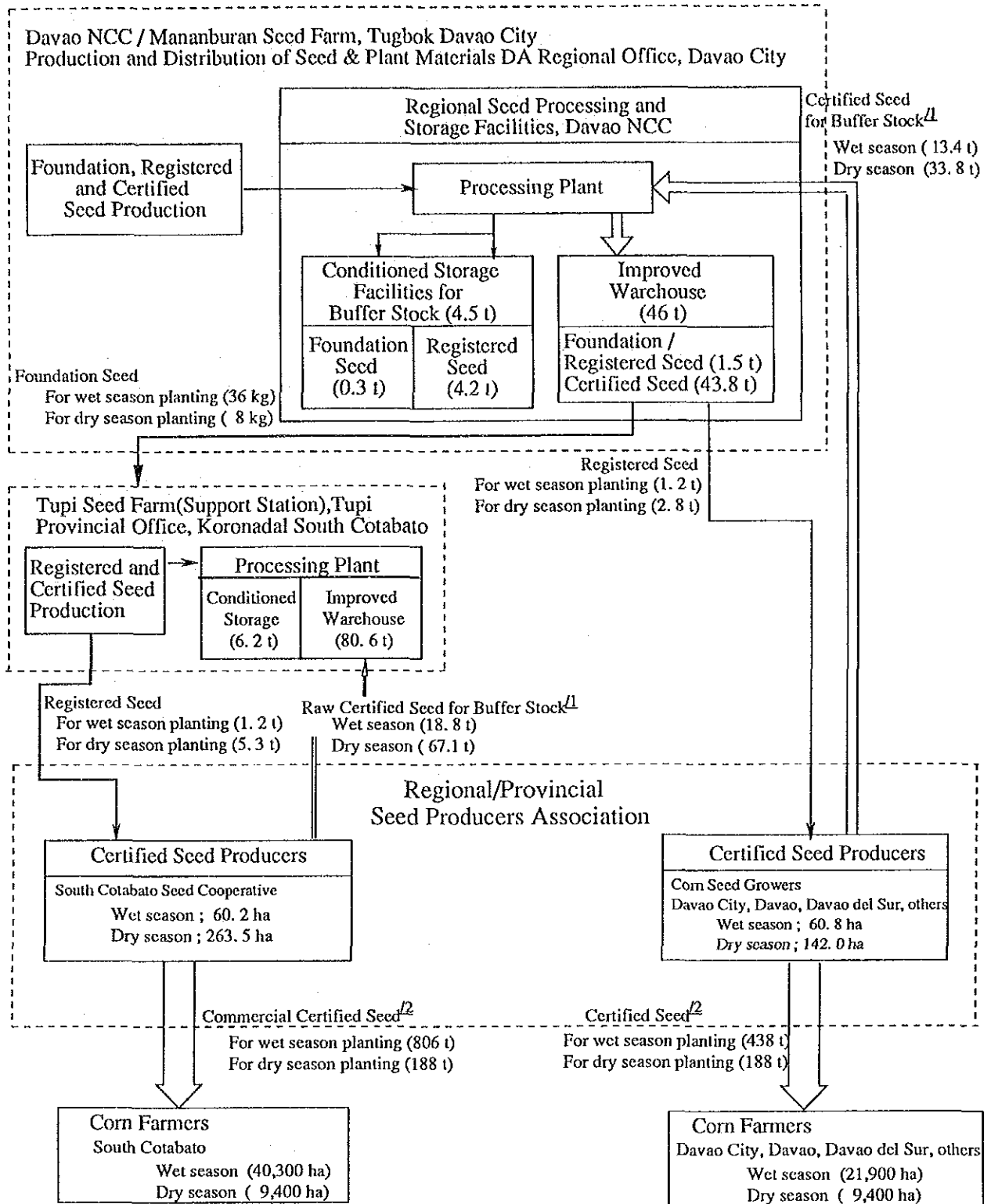


Fig. H.5.5 PROPOSED RICE SEED PRODUCTION AND DISTRIBUTION PLAN IN REGION VI



Note: ¹ ; Excluded certified seed produced in the station
² ; Included certified seed produced in the station

Fig. H.5.6 PROPOSED CORN SEED PRODUCTION AND DISTRIBUTION PLAN IN REGION XI

*Feasibility Study on
Improvement of Seed Production and Distribution, and
Establishment of Appropriate Seed Storage System*

Annex I

**Seed Producers
and
Support Services**

FEASIBILITY STUDY ON
IMPROVEMENT OF SEED PRODUCTION AND DISTRIBUTION, AND
ESTABLISHMENT OF
APPROPRIATE SEED STORAGE SYSTEM

ANNEX I SEED GROWERS AND SUPPORT SERVICES

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1. PRESENT CONDITION OF THE COUNTRY

1.1 Organization and Activities of Seed Producers Associations

1.1.1 Organization of Seed Producers Association

The Department of Agriculture (DA), particularly Bureau of Plant Industry (BPI) intends to achieve its goal in seed production and distribution with the active participation of individual seed growers. In order to be effective the seed growers bind themselves together to form an association at a provincial level in order to coordinate their activities for seed production and distribution within the province. The organization of a Provincial Seed Producers Association (PSPA) is coordinated by the Provincial Agricultural Officer (PAO) of the DA and the Provincial Seed Coordinator. The Association has to be registered with the Securities and Exchange Commission (SEC). The association has a set of officers consisting of Board of Directors, President, Vice-President, Treasurer Secretary and Auditor duly elected among the members. The function of the President is to administer and manage the activities of the association. The tenure of office of the elected officers is usually one year.

The Seed Producers Association (SPA) are grouped by province which in turn are federated at a regional level. The regional federation is usually organized with the participation of the presidents of PSPA under supervision of the Regional Director assisted by the Chief of Operation Division, Regional Seed Coordinator and the Chief of Seed Quality Control Services. The federation also has set of officers duly elected or appointed by the members during their annual conference conducted by DA. The Federation president administers, manages and coordinates the plans, programs and project activities of the seed producers association in the region. He also represents the association at national conferences, meetings, and seminars concerning the seed program of the DA. At present, only one federation throughout the country is active. This federations is located in Region VI. Their main activities include marketing and distribution of seeds produced among the members and procurement of farm inputs for the members.

1.1.2 Rice Seed Growers

Based on Table I.1.1 the present (1989) total number of Rice Seed Growers for the whole country is estimated at 1,466. On average, the number of seed growers per region is 113, ranging from 16 members in Cordillera Autonomous Region (CAR) to 242 members in Region III. The area for rice seed production by region is lowest in CAR at 46 ha and

highest in Region III at 2,620 ha. The average rice seed production area per seed grower, ranges from 3 ha in Region XI to 11 ha in Region III.

In Region II particularly Isabela Rice Seed Growers are scattered throughout the province. The total area devoted for rice seed production is 970 ha involving 123 seed growers. Aurora town occupies the largest area with 278 ha involving 9 seed growers. On the other hand, Ilagan has the smallest with 0.8 ha, with 1 seed grower only. Out of 123 municipalities, 10 have no seed growers.

It is noted that there are provinces without Rice Seed Growers at all. These are mainly concentrated in CAR, like Abra, Benguet, Mountain Province and Ifugao. Other provinces include Batanes in Region I, and Sulu in Region IX.

1.1.3 Corn Seed Growers

The total number of Corn Seed Growers as of 1983 is estimated at 285 covering around 952 ha throughout the entire country as shown in Table I.1.2. The region with the highest number of seed growers is in Region II with 77, while the regions with the least number is in Region I and Region X with five seed growers each. In terms of area, out of 1,302 ha devoted for corn seed production 217 ha is in Region X and only 10 ha in Region I.

On average, the area devoted to corn production is 4.1 ha per farm. By region, it is highest in Region X with 43 ha per farm due to the share of Philippine National Construction Corporation (PNCC, formerly CDCP) with 123 ha and lowest in Region XI with 1.4 ha per farm.

In case of Iloilo province in Region VI the current total area devoted to rice seed production is about 244 ha involving 42 seed growers. In terms of area Dumangas has the largest with 55 ha devoted to seed production involving 7 Rice Seed Growers.

1.1.4 Activities of Seed Producers Associations

Basically the main activity of the SPA which are organized on a provincial basis is centered in the coordination of members to produce the certified seed required by the farmers. The function of the association is to help the seed growers to produce the certified seed required by the farmers within each province or region. In relation to the demand of certified seeds in the province or region, the association (in coordination with the regional seed

coordinator and seed inspector) determines the varietal requirement to be produced and distributed on the basis of the seed production program.

In addition to the above activities and based on the inquiries made by the team during the field survey at Region II, VI, and XI, activities of the Seed Growers Association (SGA) are as follows :

- a) To render assistance and coordinate the procurement of seeds from Experiment Stations and Seed Farms for distribution to members,
- b) To assist in the distribution and marketing of the seed produced by members,
- c) To disseminate information in respect of new farming technologies and market prices of farm inputs and outputs,
- d) To help members with crop production loans .

The associations usually meet regularly depending on the need to discuss matters relevant to the production and distribution of seeds activities with the supervision of the provincial coordinator.

1.2 Seed Growers' Profitability

For comparison of the profitability of seed production and ordinary production for the three study crops, a summary table was prepared and shown below.

| | (₱1,000/ha) | | | | | |
|-----------------------|------------------|----------|------|----------|---------|----------|
| | Rice (irrigated) | | Corn | | Peanuts | |
| | Seed | Ordinary | Seed | Ordinary | Seed | Ordinary |
| Production cost | 10.6 | 5.9 | 10.0 | 1.8 | 7.4 | 3.0 |
| Gross return | 21.0 | 8.2 | 30.0 | 3.5 | 24.0 | 9.4 |
| Net return | 10.4 | 2.3 | 20.0 | 1.7 | 16.1 | 6.4 |
| Net profit cost ratio | 1.0 | 0.4 | 2.0 | 0.9 | 2.2 | 2.1 |

(See Tables I.1.3 to I.1.5)

In the case of rice seed production the estimated total production cost is ₱10,552/ha compared with the ordinary rice cost on the average of 1987-1988 at ₱5,904/ha. In terms of net return per hectare, seed rice farmer will realize ₱10,448 higher than that of the ordinary paddy farmer with only ₱2,344. The net profit ratio for seed rice production is also higher at 1.0 over that of ordinary rice production of 0.40. The cost and return estimates for corn seed production results to very high net returns of ₱19,951/ha compared to the average of 1987-

1988 at only ₱1,687/ha, the increase is about 11.8 times. Furthermore, in terms of profit cost ratio, corn seed production is very significant over that of ordinary corn production with 1.99 over that of 0.63 for ordinary corn production. The profitability of corn seed production over that of ordinary corn seed production is mainly attributed to the increase in the production and the price of seeds due to high quality. For peanut seed production, the net return per hectare is about ₱16,608 compared with ₱6,422 for ordinary peanut production. However, on net profit cost ratio, the figure on the average of 1987-1988 for ordinary corn production is higher at 2.12 over that for seed production which is 0.80. The main reason for this is the higher cost of production which is estimated at 2.9 times higher.

Based on the above estimates and comparison, between seed production and ordinary production for rice, corn and peanuts it is concluded that profitability of production is higher for seed production over that of ordinary production. It also reflects that higher investment is required for seed production, but, in return this gives a higher profit.

1.3 Seed Related Support Services

The present government support services to the seed growers are still limited. The present services by the Agricultural Production Technicians (APT) of DA in the proper seed production practices are still minimal, and very few seed growers were able to avail the services of the APT, so that seed growers have to depend on their own technology for seed production. The services of the seed inspector are also confined to seed certification, and the seed inspector only comes to the seed growers field when seed certification is needed.

With regard to the training system for extension workers, seed inspectors, operators of seed related facilities is still inadequate. The last time the government conducted training in seed certification and its related aspects was in 1988 it was conducted in each Region.

At present cooperative activity for production and marketing is still weak among seed growers. Support services from the government on this aspect is still lacking. What is happening now is that the seed growers use their own initiatives both in production and marketing.

2. BASIC IMPROVEMENT PLAN OF OTHER SUPPORT SERVICES

2.1 Extension Services

To achieve production of sufficient amount of high quality seed, it is necessary to train all the personnel involved in seed production and distribution, especially in the field of seed production and quality control technique as follows :

- to train the seed growers and extend technical services for them especially on seed production, post harvest operation technique and storage and also by upgrading the technique of seed inspector/extension workers,
- to train officials, staff and workers at seed centers for proper crop management in the seed farm, operation and maintenance of seed processing and storage facilities and equipment,
- to avail the facilities, equipment and materials required for the above extension and training services.

2.2 Organization of Seed Growers

The present set up of seed growers must be strengthened by promoting the organization of growers for further increase in high quality seed production. Through the strengthening of coordination among the seed growers, the following activities will be facilitated:

- systematic, proper and timely execution of procurement of inputs, marketing of products,
- systematic and effective utilization of facilities for seed processing, drying and storage, etc. through the seed growers' cooperative activities,
- promotion of a coordinated effort between the government and the seed growers to contribute more in the production of high quality seed and expand the use of the certified seed by the common farmers.

2.3 Credit Services

To attain the objective of wider participation of seed growers in the production of high quality seeds, strong support services in the financial aspect for the growers is inevitable. The main points to be strengthened in the credit service system are as follows :

- to continue on strengthening the Rice Production and Enhancement Program (RPEP) program which at present is providing certified seed and fertilizers to the farmers,
- to expand the credit items to be granted to the seed growers, such as processing facilities and equipment, storage for seed, etc.

3. PRESENT CONDITION OF MODEL AREA

3.1 Location and Socio-Economy

3.1.1 Location

The locations of the three Model Areas for the three study crops are distinctly separated by Island and by Region, Peanut in Luzon, Rice in Visayas and Corn in Mindanao. These are shown in Figures I.3.1 to I.3.3.

For Peanut, the model area is located in Region II particularly in Isabela, Cagayan and Quirino provinces. The seat of the Regional Capital is in Tuguegarao, Cagayan which can be reached from Manila by air transportation via Tuguegarao airport and also Cagayan airport in Isabela. By land transportation it could be reached from Manila by any motor vehicle via Maharlika highway passing through Dalton pass in Nueva Vizcaya by approximately 10 hours. It is also accessible by sea transport which would be passing Luzon Sea through Babuyan channel and dock at Appari, Cagayan. The model station is Ilagan Experiment Station which is located in Ilagan Isabela about 150 km from the Regional Capital.

In the case of Rice, the model area is situated in Region VI consisting the provinces of Iloilo Capiz, Aklan, Antique, Negros Occidental and sub province of Guimaras which is adjacent to Iloilo city. Iloilo city is the designated Regional Capital and it is accessible from Manila by both air and sea transport. Four existing airports are available in the Region from Manila, these are, Iloilo city, Bacolod in Negros Occidental, Kalibo in Aklan and San Jose de

Buenavista in Antique. By sea transport Iloilo could be reached via Visayan Sea and Panay Gulf.

The Visayas experiment station is located in Jaro, Iloilo about 9 kilometers from Iloilo city while the La Granja National Crop Center can be found in Negros Island south, east of Iloilo particularly in La Carlota city, Negros occidental.

Corn model area is located in Region XI southern part of Mindanao comprising six provinces namely South Cotabato, Davao del Sur, Davao, Davao Oriental, Surigao del Sur and Davao city. The seat of Regional Capital is in Davao City where it is accessible from Manila by air or sea. The available and existing ports are located in Davao city, General Santos city and in Bislig. For sea transport from Manila, Davao city can be reached through the existence of Davao sea port. Davao city could be reached from Manila by land transport passing through the Maharlika highway in the south and through ferry boat in Visayas. However, it will take around 55 hours to reach Davao city from Manila.

The model station, Davao National Crop Center is located in Davao city while Tupi Seed Farm is located in Tupi at South Cotabato around 150 km from Davao city.

3.1.2 Demography

Based on the data of population projections from the National Census and Statistics Office (NCSO), the total population of the three provinces at Region II sums up to 2.1 million with a total number of household of 429 thousand. Population density is estimated at 94 person per square kilometer.

The average size per family is five (5) and the annual population growth rate is 1.2%. Rural population is higher at 79% over that of the urban population. The inhabitants are dominated by Ilocanos and Ibanags and their major source of income comes from farming.

In Region VI, the current total population in the six provinces is 5.7 million consisting of 945 thousand households. The estimated average size of family is six (6). Population density is computed at an average of 280 per square kilometer which is very much higher compared to Region II. Annual growth rate based on the last ten years is 1.03%. Rural population share is 67% over that of 33% urban population. Ilongos dominate the region and their major source of livelihood is farming.

In the case of Region XI, the current population is about 5.0 million with an estimated total number of households of 789 thousand. The average size of household is estimated at 6.3 higher compared to Region II and Region VI. Population density will reached to about 153 person per square kilometer and the estimated share of rural population is about 59% over that of the urban population. The population growth rate is calculated at 1.22% annually higher compared to Regions II and VI. This may be due to migration of people from Luzon and Visayas area to this particular region.

Agriculture is the main source of income among the populace.

Table below shows the demographic condition of the three particular model Regions.

| Model Region | Physical Area (000 ha) | Population 1990 (000) | Population Density (Pop./km ²) | Number of Household (000) | Average Family Size (No.) | Percent of Rural Population (%) |
|--------------|------------------------|-----------------------|--|---------------------------|---------------------------|---------------------------------|
| Region II | 2,272 | 2,147 | 94 | 429 | 5.0 | 79 |
| Region VI | 2,023 | 5,670 | 280 | 945 | 6.0 | 67 |
| Region XI | 3,234 | 4,961 | 153 | 789 | 6.3 | 59 |

3.1.3 Present Land Use

Majority of the area in the three model regions is occupied by forest land ranging from 17% of Region VI to 46% in Region II. The share of area devoted for production of irrigated rice ranges from 5% in Region XI to 7% in both Regions II and VI. The share of rainfed were ranges from 2% in Region II to 10% in Region VI.

Diversified crops area where corn and peanut are included as planted crops, the share ranges from 9% in Regions II and XI to 21% in Region VI. The share of the area devoted to agricultural production is highest in Region VI with a share of 52% and lowest in Region II with only 23% share. The land use Table is shown as follows.

| Land Use | Region II | | Region VI | | Region XI | |
|---------------------|------------------|--------------|------------------|--------------|------------------|--------------|
| | Area (000 ha) | Share (%) | Area (000 ha) | Share (%) | Area (000 ha) | Share (%) |
| Total physical area | 2,227 | 100 | 2,020 | 100 | 3,535 | 100 |
| Rice: | | | | | | |
| Irrigated | 162 | 7 | 150 | 7 | 175 | 5 |
| Rainfed | 38 | 2 | 194 | 10 | 91 | 3 |
| Diversified crops | 194 | 9 | 429 | 21 | 299 | 9 |
| Permanent crops | 111 | 5 | 278 | 14 | 554 | 17 |
| Forest area | 1,057 | 46 | 334 | 17 | 969 | 30 |
| Pasture land | 253 | 11 | 5 | * | 227 | 7 |
| Grass land | 385 | 17 | 300 | 15 | 641 | 20 |
| Other land | 69 | 3 | 332 | 16 | 280 | 9 |

* Insignificant

3.2 Organization and Activities of the Seed Producers Association

3.2.1 Criteria for Admission to the Seed Producers Association

The criteria presently established by the seed producers association under the three model Regions in admitting their members aims to promote the production of high quality seeds. This is shown in Table I.3.1.

The criteria set on the size of farm for seed production requires a larger one because the production is not only intended to cater the needs of the seed growers but also for other seed growers in the province and other provinces or regions. For rice seed production it is set at a minimum of 5 ha compared to 1 ha set for peanut in Region II and 2 ha set for corn production in Region XI.

On the training requirement aspect, a seed producer should know the proper production technology in order to produce high quality seeds.

Regarding the condition of the seed production area, it is a must that a rice seed producers area is irrigated mainly due to rice crop needs adequate irrigation water and proper timing of irrigation water delivery.

Likewise, ownership of farm machinery is included as one criteria for admission because seed production requires intensive and proper timing of farm operations it is but necessary and inevitable to utilize agricultural machineries and other post facilities in the production of desired quality seeds.

3.2.2 Present Organizational Structure

It is obvious that in any organization there is always a set of officers to manage and lead the group in any activities they want to undertake. As shown in Table 1.3.2 all the set of officers are the same in all the SPA covered by the model regions. The officers elected include Board of Directors, President, Vice President, Secretary, Treasurer and auditor. They are elected by the members annually except in Region XI where only 1 of the 4 associations do it annually. This is shown in Table I.3.3.

In Region II for peanut, the Maddela peanut planters cooperative is existing with about 600 member active at present.

All the SGA in Region VI have not yet converted into a cooperative. However, it is only in this region where Seed Growers Federation is formed, established and actively motivated.

In Region XI all the SGA except one have converted themselves into a Seed Producers Cooperative.

3.2.3 Frequency and Purpose of General Assembly Meeting

The frequency of general assembly meeting differ from association to association in the three model Regions as shown in Table I.3.4. However, it is suggested that a regular meeting must be done in all the SGA to update and disseminate new seed production technology for the purpose of attaining production of high quality seeds.

As mentioned in Table I.3.5 the purposes of holding general assembly meeting are election of officers, financial report on the status of the association and information dissemination related to seed procurement and distribution. These activities would directly benefits the association members and almost uniform in all the association covered by the model regions.

3.2.4 Existence of Permanent Office and Availability of Office Facility

It is noted in Table I.3.6 that not all the SGA covered by the three model regions have permanent office and available office facilities. To develop good relationship and linkage among the members of the association it is very important that a permanent office and

availability of office facilities is established. Good communication and fast processing of papers needed by the association is inevitable.

Comparing the existence of permanent office among the SGA in the three model regions, associations in Region XI is highest with 67%. The reason may be the associations were already converted into a cooperative in which it requires a permanent office.

3.2.5 Activities of the Seed Growers Associations

As exhibited in Table I.3.7 the present activities of the different SGA or cooperatives are more or less of the same nature in the whole three model regions.

In Maddela Peanut Planters Cooperative at Region II, the present activity includes contacting buyers of peanut and corn produce by the members particularly from Manila traders and processors and charging the members a minimum of 0.50/kg sold from his produce.

In Region VI, the federation of seed producers association usually monitors the inventory of seed produce by the individual SGA and assists them on the marketing and distribution of these seed stocks. The associations also assist their members in the procurement of their seeds and farm inputs by instructing them where to procure the desired farm inputs.

For Region XI, the seed producers cooperative activities include the coordination in the procurement of seeds from the seed farms and stations, selling and distribution of farm inputs like fertilizers and agro-chemicals among the members and coordinates in the distribution of seed produce by the members.

These present limited activities of all the concerned SPA may be attributed to the limited capital of the associations and also lack of full cooperation among the members.

3.2.6 Number and Area of Seed Growers

The present number and area for seed production of the seed growers on the three study crops in the three model regions are presented in Figures I.3.4 to Figure I.3.15. In case of peanut in Region II only 9 active seed growers with a total area of seed production can be found in Maddela, Quirino, however, due to inavailability of registered and certified seeds, their planting materials usually comes from their previous production.

In case of rice in Region VI the total number of seed growers is 105 with a total area of seed production of 543 ha. These seed growers are distributed in the six provinces but the majority is located in Iloilo with 40% share on the total numbers and about 23% share on the total area for seed production.

For corn in Region XI the present total number of seed growers is 36 cultivating an area of 63 ha.

3.3 Seed Growers Economy

3.3.1 Average Area of Landholding

Based on the results of the farm survey interview the average area of landholding among the seed growers are estimated as follows; 2.5 ha in Region II peanut seed growers, 13.2 ha for rice seed growers in Region VI and 7.0 ha among the corn seed growers at Region XI. It is reflective from the figures that rice seed growers have larger landholding compared to corn and peanut seed growers. The proportion of irrigated area on the average landholding, for Region II is zero, while for Region VI, 71% of the average landholding is under irrigation and for Region XI, 41% is under irrigation.

3.3.2 Average Area for Seed Production

The Table below shows the average area for seed production among the sample seed growers in the three model regions. It is observed that peanut seed growers have the smallest average area with only 0.68 ha compared to rice seed growers which have the largest with 7.72 ha. For corn the average area for seed production is 1.42 ha.

Cropping intensity is high on peanut seed production with 278% and low in rice seed production at 183% and corn seed is 194%. The reason for low cropping intensity for rice seed is due to inadequate supply of irrigation water during the dry season.

It is noted that peanut and corn seed production areas are rainfed in contrast to rice seed production area which are all irrigated.

| | Peanut Seed Grower (ha) | Rice Seed Grower (ha) | Corn Seed Grower (ha) |
|------------------------|----------------------------|--------------------------|--------------------------|
| Wet Season | 0.68 | 7.72 | 1.42 |
| Dry Season | 1.21 | 6.41 | 1.33 |
| Cropping Intensity (%) | 278 | 183 | 194 |

3.3.3 Average Yield

The present average yield of the three study crops in the model regions are as follows :

| Item | Peanut Seed (t/ha) | Rice Seed (t/ha) | Corn Seed (t/ha) |
|-------------|-----------------------|---------------------|---------------------|
| Wet Season: | | | |
| Registered | — | 3.6 | 2.2 |
| Certified | 1.1* | 3.6 | 2.8 |
| Dry Season: | | | |
| Registered | — | 3.4 | 2.3 |
| Certified | 1.2* | 3.8 | 2.6 |

* commercial

Rice yields for both certified and registered seeds during the wet season is the same. However, during the dry season, yield for certified seeds is higher over that of registered seed. The difference is due mainly to water availability and management. Likewise for corn the trend in yield shows higher for certified seed over that of certified seeds.

3.3.4 Crop Budget

The present crop budget is prepared to determine the profitability of the three study crops in the three model regions. It is prepared both on wet season and dry season separately and is based on the current 1990 prices. This is shown in Table I.3.11 to Table I.3.13.

Based on the table below, net return for corn is highest among the three crops with the seed grower realizing ₦19,420/ha during the wet season.

Rice seed grower can obtain a net return of ₦15,100/ha during the dry season.

Peanut seed growers could only get a net return of ₱4,080/ha and ₱3,855/ha during the dry and wet season respectively.

The big difference in the net return for corn seed growers compared to peanut and rice is attributed to the high price of corn seeds compared to lower price of rice and peanut seeds.

Unit: (₱)

| Item | Peanut Seed | | Rice Seed | | Corn Seed | |
|------------------|-------------|------------|------------|------------|------------|------------|
| | Wet Season | Dry Season | Wet Season | Dry Season | Wet Season | Dry Season |
| Gross Income | 12,100 | 12,240 | 24,010 | 22,680 | 29,260 | 30,590 |
| Production Cost | 8,245 | 8,160 | 8,910 | 9,315 | 11,160 | 11,170 |
| Net Return | 3,855 | 4,080 | 15,100 | 13,365 | 18,100 | 19,420 |
| Net Profit Ratio | 0.5 | 0.5 | 1.7 | 1.4 | 106 | 107 |

(See Tables 3.7.3, 3.7.4 and 3.7.5)

In order to increase the seed productivity it is important to increase the net seed production and increase the price of seed particularly rice and peanut.

3.3.5 Farm Budget

Seed growers economy is also analyzed in terms of the farm budget prepared based on the results of the farm-survey conducted. It is however, concentrated only to owner operator mainly due to all the samples interviewed are owner operators. The farm budget table is summarized as follows :

| Item | Unit | Peanut Seed (t/ha) | Rice Seed (t/ha) | Corn Seed (t/ha) |
|---------------------|----------|--------------------|------------------|------------------|
| Average Family Size | (person) | 6 | 6 | 6 |
| Average Farm Size | (ha) | 0.68 | 7.72 | 1.42 |
| Cropping Intensity | (%) | 278 | 183 | 194 |
| Gross Farm Income | (₱) | 24,200 | 335,655 | 82,325 |
| Off-Farm Income | (₱) | 1,550 | 8,890 | 5,000 |
| Non-Farm Income | (₱) | 9,650 | 66,450 | 11,335 |
| Total Gross Income | (₱) | 35,400 | 400,995 | 98,570 |
| Production cost | (₱) | 14,585 | 128,495 | 30,705 |
| Net Income | (₱) | 20,815 | 282,500 | 67,865 |

The farm budget shows that the average net income among the rice seed growers in Region VI is very high compared to peanut seed growers and corn seed growers. However, corn seed growers net income is higher compared to peanut seed growers. The difference in the net income among the groups of seed growers could be attributed to the size of farm, price of crops, non-farm income and off-farm income.

On the annual average family expenditures among the three groups of seed growers, rice seed growers spend more at ₱137,400 compared to ₱103,055 for corn seed growers and ₱29,185 for peanut seed growers.

3.4 Seed Related Support Services

Data and informations on support services gathered during the field survey on the three model regions strongly confirms that limited quantity of support services coming from both government and private sectors are extended to the seed growers. Government programs like the RPEP which have been launched two years ago and which component includes certified seed distribution and fertilizer subsidy and intensive extension services seems to be failure that made demoralization on the part of the seed growers for rice.

At present, the current government program on rice includes Rice Action Program which was launched in May 1990 which aims to increase the production of rice through the use of fertilizer and certified seeds. However the assistance of the government is only limited to fertilizer subsidy at the moment. The newly launched government program for corn is the Corn Production Enhancement Program (CPEP), whose aim is to increase corn production by at least 10% over that of 1989 level of production. For Phase I of this program it is focus on the fertilizer assistance and for Phase II it includes the provision on improved corn variety seeds. South Cotabato in Region VI is covered by this program.

Peanut Production Program at present includes the Peanut Development Project under the DA and Philippine Council of Agricultural Research and Resources Development (PCARRD) Cooperative Project-A four year project in which one of the selected pilot areas is in Region III particularly Isabela, Cagayan and Quirino. The component technology includes the use of an improved variety and the use of inoculation. These input seeds and inoculants are provided by the project on loan basis payable in kind after the harvest. This project has started in dry season 1988-1989.

On the extension support services from the DA, the present activities of the Regional and provincial seed coordinators are almost uniform in all the three model regions. Their

activities includes coordination and supervision in the monitoring of seed stocks for distribution, coordinate and assists the seed growers in the procurement of planting materials and conducts training related to seed production and distribution.

From the seed inspectors, their services are only limited to seed certification and only extended to the seed growers during the harvesting period and only when notified by the concerned seed growers. At present the number of seed inspectors in each of three model regions are 9, 15 and 15 for Regions II, VI and XI respectively.

The number of Agricultural Production Technicians (APT) of the DA in each of the three model Region is adequate considering that there are 537, 1,145 and 671 in Regions II, VI and XI respectively. However their extension services in seed production is limited. According to DA the APT's now are generalist, meaning they don't have any particular field of specialization as an extension worker. By these nature of function it will affect the needed support extension services by the seed growers.

In Region II, according to the peanut seed growers, the services of the APT's is not sufficiently extended to them as what they expected to be. The seed growers are being visited by the APT's only once a year or twice a year.

In Region VI APT's extension services is better compared to Region II. They claimed they were visited by the APT's every month. While in Region XI majority of the seed growers were visited by the APT's twice in every cropping season.

The extension activities of the APT's include the proper application of farm technologies and also they conduct trainings and seminars to the seed growers.

The number of Seed Inspectors and APT's by, Region and by province are presented in Table I.3.8 and summarized as follows :

| | Number of Seed Inspector | Number of APT's | Number of Seed Growers | Total Area for Seed Production (ha) |
|-----------|--------------------------|-----------------|------------------------|-------------------------------------|
| Region II | 2 | 535 | 9 | 10.0 |
| Region VI | 15 | 1,137 | 105 | 543.5 |
| Region XI | 12 | 671 | 38 | 69.0 |

On credit services, the present government program is mainly concentrated on fertilizer assistance for rice and corn programs.

4. MODEL IMPROVEMENT PLAN

4.1 Basic Concepts for the Improvement

Considering the contribution and participation of the seed growers in the production of high quality seeds, it is very necessary to extend them the full support in order to attain successfully the objective of the seed production and distribution program.

The identified basic improvement for the seed growers in the three model regions is to improve and strengthen their organization by way of identifying the seed growers by class of seed to be produced.

Extension of services is easy to administer when the seed growers are united and well coordinated.

4.2 Proposed Organization of Seed Producers Association

4.2.1 Selection of Model Seed Growers

In the selection of peanut registered seed growers in Region II to produce the needed registered seeds which the Ilagan Experiment Station can not produce, it is proposed to be done by 3 peanut seed growers in Ilagan. The main reason is due to proximity of the seed farms to the station. The 14.1 tons deficits registered peanut seeds could be easily produced by the three seed growers because their total available potential area for peanut seed production is 30 ha, however only 5 ha each from their area is needed to produce the deficit production.

Likewise, in the production of certified peanut seeds, it is proposed that it will be undertaken by the seed growers in Maddela, Quirino. The Maddela Peanut Planters Cooperative has around 600 active members at present. They are growing peanut at an average of one (1) ha per member. So that with the required certified peanut seeds of 215 tons during the wet season and 45 tons during the dry season, these peanut growers can easily produce the required volume. The advantage of selecting the peanut seed growers in

Maddela is that they are already organized. Their area for seed production is contiguous. Therefore, coordination and communication among the seed growers is easy.

The selection of registered rice seed growers in Region VI to produce the deficit production from the Visayas Experiment Station of 19.5 tons during the dry season is recommended to Bulong-Cabugao compact farm. This compact farm has about 15 rice farmers cultivating an effective crop area of about 15 ha. It is located in Santa Barbara, Iloilo which is about 7 kilometers away from the Visayas Experiment Station. The accessibility to the facilities of the model station is easy and management and coordination among the members will not be difficult.

The certified seed production of the present 105 rice seed growers cultivating an area of 543 ha is not enough to meet the requirements of 2,857 tons during the wet season and 3,552 tons during the dry season. This current number of seed growers are scattered in the whole region and some are presently producing registered seeds. For the selection of certified rice seed grower to fill the deficit production, it is proposed that it will be taken from Iloilo province. The main reasons are, it has a wide potential irrigated area for seed production and its proximity to the model station.

In the case of corn, the deficit production of certified seeds by Davao NCC and Tupi Seed Farm would be shouldered by the corn seed growers in Davao and South Cotabato. The required area of certified seed production in the Region except South Cotabato during wet season is 60.8 ha however, the total area planted by the seed growers at present is 45 ha. This deficit area is proposed to be shouldered by the other corn growers in Davao. The deficit area during the dry season would also be taken in Davao, considering its potential wide area for corn seed production.

Likewise, in South Cotabato, the present certified seed production area during wet and dry season is 26 ha, as planned the total required area during the wet season is 60.2 ha. Comparing the present cropped area to the required area it resulted to a big difference. It is recommended that the shortage in area for certified corn seed production be shouldered by seed grower in South Cotabato. The planted area for corn in South Cotabato in 1989 is estimated at 400,960 ha during the wet season and 91,450 ha during the dry season.

4.2.2 Proposed Organization

In the three model regions, it is understood that the present Seed Growers Associations (SGA) were organized under the supervision of the Provincial Agricultured

Officer and the Provincial Seed Coordinator. However, most of these SGA are still not well organized and coordinated in their seed production and distribution activities.

This present conditions of the SGA is mainly due to :

(1) Irregular Organization Meeting

As observed, the frequency of SGA meeting are conducted once or twice a year.

It is proposed that meeting of the seed growers association be conducted regularly at least once a month to discuss every matter related to seed production and distribution activities.

(2) Existence of Federation of Seed Producers Association

At present only Region VI has a Federation of Seed Growers Association (FSGA), the other two Model Region have none. The importance of a FSGA is needed in the coordination of seed production and distribution in the region.

It is proposed that FSGA or Cooperative be formed and organized, in the other two regions. In Region VI, the existing Federation of Seed Producers Association (FSPA) is proposed to be strengthened.

(3) Training and Information Drive

Training and information drive related to seed production extended to the seed growers is still very limited. At present the technology of seed production is dependent on the technical know how of the individual seed growers.

It is then proposed that intensive training on the seed production technology be extended regularly among the members of the SGA by the Department of Agriculture (DA).

(4) Poor Self-reliance of Seed Growers

Self discipline in every member of the Association is an inevitable factor in the success of an association. This factor may be difficult to remedy however, with the proper education and training as recommended among the seed growers, this can be solved.

(5) Inconvenient Location of Seed Farms

It is noted that the seed farms among the seed growers are located far from one another. The accessibility in extending support services, and communication is difficult.

It is then proposed and programmed that the seed farms of the potential model seed growers would be located in one contiguous area.

4.3 Seed Growers Economy

The proposed seed growers economy is based on the profitability per hectare of the three study crops in the model regions. Crop budget are prepared separately for the three crops as shown in Tables I.3.16 to I.3.18. It is summarized below together with the present crop budget for comparison purposes.

Unit: Thousand pesos

| Item | Peanut Seed | | Rice Seed | | Corn Seed | |
|------------------|-------------|--------|-----------|--------|-----------|--------|
| | Present | Future | Present | Future | Present | Future |
| Gross Income | 12.1 | 23.0 | 23.3 | 29.9 | 29.9 | 51.0 |
| Production Cost | 8.2 | 7.6 | 9.0 | 9.6 | 11.2 | 10.5 |
| Net Return | 4.0 | 15.4 | 14.3 | 20.3 | 18.7 | 40.5 |
| Net Profit Ratio | 0.5 | 2.0 | 1.6 | 2.1 | 1.7 | 3.8 |

Growing the three study crops with the project indicates a high profitability. Among the three study crops corn seed shows a net profit ratio of 3.8, while rice and peanut seeds indicates a net profit ratio of 2.1 and 2.0, respectively.

To compare these figures with the present net profit ratio, for peanut seed there is a difference of 1.5, for rice, the difference is 0.5 while for corn the difference is 2.1. These difference indicate that with the project an incremental profit would be derived.

4.4 Proposed Seed Related Support Services

In Region II, the present program on Peanut Development Action Project (PDAP) is assumed to be continued and strengthened. It is also proposed that the Maddela Peanut Planters Cooperative (MPPC) be strengthened and the activities be expanded to include supply of farm inputs and credit.

Extension services especially peanut seed production technology be extended to the seed growers through the Agricultural Production Technologist (APT) is also proposed.

Likewise, in Region VI, the proposed seed related support services includes, strengthening the Rice Action Program to include the assistance on the certified seed usage among the farmers. It is also recommended that extension services among the APT be intensive by giving them some incentives.

The proposed related seed support services for corn seed growers would include continuation and strengthening of the corn Production Enhancement Program. Promotion on the planting of open-pollinated certified corn seeds by the concerned personnel is proposed. It is also necessary to recommend that extension services by the APT be more frequent by also giving them some incentives and the necessity of motor vehicles for their mobility.

Table I.1.1 NUMBER AND AREA OF RICE SEED GROWERS BY REGION (1989)

| Region | No. of Rice Seed Grower | | Area of Rice Seed Grower | | Average Area (ha/Grower) |
|-------------|----------------------------|--------------|-----------------------------|--------------|--------------------------------|
| | No. | Share (%) | Area (ha) | Share (%) | |
| Philippines | 1,466 | 100 | 7,365 | 100 | 5.0 |
| CAR | 16 | 1 | 46 | 1 | 2.9 |
| I | 105 | 7 | 350 | 5 | 3.3 |
| II | 144 | 10 | 598 | 8 | 4.0 |
| III | 242 | 17 | 2,619 | 35 | 10.8 |
| IV | 127 | 9 | 371 | 5 | 2.9 |
| V | 168 | 11 | 817 | 11 | 4.9 |
| VI | 105 | 7 | 543 | 7 | 5.2 |
| VII | 44 | 3 | 112 | 2 | 2.6 |
| VIII | 73 | 5 | 362 | 5 | 5.0 |
| IX | 30 | 2 | 121 | 2 | 4.0 |
| X | 96 | 7 | 268 | 4 | 2.8 |
| XI | 221 | 15 | 676 | 9 | 3.1 |
| XII | 90 | 6 | 482 | 6 | 5.4 |

Table I.1.2 NUMBER AND AREA OF CORN SEED GROWERS BY REGION (1983)

| Region | No. of Corn Seed Grower | | Area of Corn Seed Grower | | Average Area (ha/Grower) |
|-------------|----------------------------|--------------|-----------------------------|--------------|--------------------------------|
| | No. | Share (%) | Area (ha) | Share (%) | |
| Philippines | 321 | 100 | 1,302 | 100 | 4.1 |
| I | 5 | 2 | 10 | 1 | 2.0 |
| II | 77 | 24 | 406 | 31 | 5.3 |
| III | 15 | 5 | 65 | 5 | 4.3 |
| IV | 33 | 10 | 123 | 9 | 3.7 |
| V | 10 | 3 | 36 | 3 | 3.6 |
| VI | 51 | 16 | 187 | 14 | 3.7 |
| VII | 15 | 5 | 35 | 3 | 2.3 |
| VIII | 14 | 4 | 37 | 3 | 2.6 |
| IX | 31 | 10 | 43 | 3 | 1.4 |
| X | 5 * | 2 | 217 | 17 | 43.4 * |
| XI | 38 | 12 | 63 | 5 | 1.7 |
| XII | 27 | 8 | 80 | 6 | 3.0 |

Note: * Includes 170 ha. of Construction Development Corporation of the Philippines (CDCP) farm

Table I.1.3 RICE SEED PRODUCTION COST AND RETURN

| Item | Quantity | Unit | Unit Price (P) | Amount (P) |
|---|----------|-----------|----------------|------------|
| I. Labor | | | | |
| Seed Bed Preparation | | | | |
| Buffaloes | 3 | head-day | 26 | 78 |
| Labor | 3 | man-day | 54 | 162 |
| Land Preparation | | | | |
| Power tiller | 8 | hour | 150 | 1,200 |
| Buffaloes | 12 | head-day | 26 | 312 |
| Labor | 12 | man-day | 54 | 648 |
| Transplanting | 20 | man-day | 54 | 1,080 |
| Crop Management | 25 | man-day | 54 | 1,350 |
| Harvesting | 20 | man-day | 54 | 1,080 |
| Post Harvest Work | 20 | man-day | 54 | 1,080 |
| II. Material Inputs | | | | |
| Seeds | 50 | kg | 8 | 400 |
| Fertilizers | | | | |
| Urea | 100 | kg | 3.9 | 390 |
| Ammophos | 100 | kg | 5.4 | 540 |
| Complete | 100 | kg | 4.6 | 460 |
| Agro-chemicals | | | | |
| Thiodan | 2 | liter | 120 | 240 |
| Azodrin | 2 | liter | 210 | 420 |
| Sack | 100 | sack | 6 | 600 |
| III. Irrigation Feed | 100 | kg | 5 | 500 |
| IV. Total Production Cost (I + II + III) | | | | 10,552 |
| V. Total Production/ha | 3,000 | kg (seed) | 7 | 21,000 |
| VI. Net Return (V - IV) | | | | 10,448 |
| VII. Net Profit Ratio (VI/IV) | | | | 1.0 |

Table I.1.4 CORN SEED PRODUCTION COST AND RETURN

| Item | Quantity | Unit | Unit Price (P) | Amount (P) |
|--|----------|----------|----------------|------------|
| I. Labor | | | | |
| Land Preparation | | | | |
| Power tiller | 8 | hour | 150 | 1,200 |
| Buffaloes | 17 | head-day | 26 | 442 |
| Labor | 17 | man-day | 54 | 918 |
| Planting | 4 | man-day | 54 | 216 |
| Crop Management | | | | |
| Labor | 32 | man-day | 54 | 1,728 |
| Buffaloes | 8 | head-day | 26 | 208 |
| Harvesting | 20 | man-day | 54 | 1,080 |
| Post Harvest Work | 15 | man-day | 54 | 810 |
| II. Material Inputs | | | | |
| Seeds | 20 | kg | 15 | 300 |
| Fertilizers | | | | |
| 21-0-0 | 200 | kg | 2.5 | 500 |
| Complete | 200 | kg | 4.6 | 928 |
| Agro-chemicals | | | | |
| Pesticide | 4 | liter | 150 | 600 |
| Fungicide/Herbicide | 4 | kg | 175 | 700 |
| Sack | 70 | sack | 6 | 420 |
| III. Total Production Cost (I + II) | | | | 10,049 |
| IV. Total Production/ha | 2,400 | kg | 12.5 | 30,000 |
| V. Net Return (IV - III) | | | | 19,951 |
| VI. Net Profit Ratio (V/III) | | | | 2.0 |

Table I.1.5 PEANUT SEED PRODUCTION COST AND RETURN

| Item | Quantity | Unit | Unit Price (P) | Amount (P) |
|--|----------|--------------|----------------|------------|
| I. Labor | | | | |
| Land Preparation | | | | |
| Power tiller | 4 | hour | 150 | 600 |
| Buffaloes | 8 | head-day | 26 | 208 |
| Labor | 8 | man-day | 54 | 432 |
| Fert. and Inoculation | 3 | man-day | 54 | 162 |
| Planting | 2 | man-day | 54 | 108 |
| Crop Management | | | | |
| Labor | 14 | man-day | 54 | 756 |
| Buffaloes | 2 | head-day | 26 | 52 |
| Harvesting | 9 | man-day | 54 | 486 |
| Post Harvest Work | 10 | man-day | 54 | 540 |
| II. Material Inputs | | | | |
| Seeds | 100 | kg/unshelled | 25 | 2,500 |
| Fertilizers | | | | |
| Complete | 3 | kg | 232 | 696 |
| Inoculant | 200 | gram | 0.1 | 20 |
| Agro-chemicals | | | | |
| Pesticide | 2 | liter | 150 | 300 |
| Fungicide/Herbicide | 500 | gram | 0.264 | 132 |
| Sack | 67 | sack | 6 | 400 |
| III. Total Production Cost (I + II) | | | | 7,392 |
| IV. Total Production/ha (unshelled) | 1,200 | kg | 20 | 24,000 |
| V. Net Return (IV - III) | | | | 16,608 |
| VI. Net Profit Ratio (V/III) | | | | 2.2 |

Table I.3.1 CRITERIA SET BY SGA FOR MEMBERSHIP ADMISSION

| Criteria | Region II | Region VI | Region XI |
|--|------------------------------|------------------------------|------------------------------|
| 1. Size of seeds production area | minimum 1.0 ha | minimum 5.0 ha | minimum 2.0 ha |
| 2. Ownership of agricultural Machinery | Preferable | Preferable | Preferable |
| 3. Location of land holding | Accessible to transportation | Accessible to transportation | Accessible to transportation |
| 4. Seed Production Training/ Seminar | must undergo | must undergo | must undergo |
| 5. Good moral character | yes | yes | yes |
| 6. Financial condition | Preferable | Preferable | Preferable |
| 7. Condition of seed field area | Preferable | irrigated | Preferable |

Table I.3.2 PRESENT SET OF OFFICERS OF THE SGA

| Officers | Region II (%) | Region VI (%) | Region XI (%) |
|-------------------|---------------|---------------|---------------|
| Board of Director | 100 | 100 | 50 |
| President | 100 | 100 | 100 |
| Vice-President | 100 | 100 | 100 |
| Secretary | 100 | 100 | 100 |
| Treasurer | 100 | 100 | 100 |
| Auditor | 100 | 100 | 100 |

Table I.3.3 MODE AND FREQUENCY OF SELECTION OF OFFICERS OF THE SGA

| Particular | Region II (%) | Region VI (%) | Region XI (%) |
|-------------------------|---------------|---------------|---------------|
| Mode of Selection: | | | |
| a. Elected | 100 | 100 | 100 |
| 2. Appointed | 0 | 0 | 0 |
| Frequency of Selection: | | | |
| a. Annually | 25 | 100 | 100 |
| b. Every 2 years | 75 | 0 | 0 |

Table I.3.4 FREQUENCY OF GENERAL ASSEMBLY MEETING BY SGA

| Frequency | Region II (%) | Region VI (%) | Region XI (%) |
|--------------|---------------|---------------|---------------|
| Twice a year | 25 | 66 | |
| Once a year | | 17 | 50 |
| Once a Month | 75 | 17 | 17 |
| Quarterly | | | 33 |

Table I.3.5 PURPOSE OF CALLING GENERAL MEETING BY SGA

| Purpose | Region II (%) | Region VI (%) | Region XI (%) |
|---|---------------|---------------|---------------|
| 1. Election of officers | 100 | 100 | 100 |
| 2. Financial Report of the SGA | 100 | 100 | 100 |
| 3. Information dissemination related to seed procurement and distribution | 100 | 100 | 100 |
| 4. Discussion of problems related to the operation activities of the SGA | 100 | 100 | 100 |

Table I.3.6 EXISTENCE OF PERMANENT OFFICE OF SGA AND AVAILABILITY OF OFFICE FACILITIES

| | Region II (%) | Region VI (%) | Region XI (%) |
|---|---------------|---------------|---------------|
| a. Existence of Permanent Office: | | | |
| Yes | 25 | 33 | 67 |
| No | 75 | 67 | 33 |
| b. Availability of Office Facilities for SGA with office: | | | |
| 1. Typewriter | 100 | 100 | 100 |
| 2. Table | 100 | 100 | 100 |
| 3. Chair | 100 | 100 | 100 |
| 4. Filing Cabinet | 100 | 100 | 75 |
| 5. Calculators | | | 50 |

Table I.3.7 ACTIVITIES OF SGA RELATED TO SEED PRODUCTION AND DISTRIBUTION

| Region II | Region VI | Region XI |
|--|--|--|
| 1. Monitors the selling of produce certified seeds among its members. | 1. Facilitates in the delivery and distribution of seed to be marketed by the members. | 1. Assists its member in the marketing of seeds produce. |
| 2. Assists the member in the procurement of seed by instructing them where to procure their seeds. | 2. Monitors the inventory of seed stocks among its members for possible distribution. | 2. The association conducts trainings and seminars to its members in relation to new seed production technology. |
| 3. Disseminates information on the prices of seeds and farm inputs. | 3. Assists the members in the procurement of farm inputs by instructing them where to procure. | 3. The association assists its members in the procurement of quality seeds. |

Table I.3.8 NUMBER OF SEED INSPECTORS AND EXTENSION WORKERS

| Regional Province | No. of Seed Inspector | No. of Extension Worker | No. of Seed Growers | Total Area for Seed Productions (ha) |
|-------------------|-----------------------|-------------------------|---------------------|--------------------------------------|
| Region II | | | | |
| Isabela | 4 | 250 | — | — |
| Cagayan | 3 | 226 | — | — |
| Quirino | 2 | 59 | 9 | 10.0 |
| Sub-total | 9 | 535 | 9 | 10.0 |
| Region VI | | | | |
| Iloilo | 5 | 503 | 42 | 244.2 |
| Capiz | 2 | 154 | 23 | 102.8 |
| Aklan | 2 | 164 | 18 | 56.0 |
| Quimaras | 1 | 30 | 12 | 42.0 |
| Antique | 1 | 110 | 5 | 38.5 |
| Negros Occidental | 4 | 177 | 5 | 60.0 |
| Sub-total | 15 | 1,137 | 105 | 543.5 |
| Region XI | | | | |
| South Cotabato | 4 | 137 | 19 | 26.0 |
| Davao | 3 | 148 | — | — |
| Davao City | 1 | 82 | 4 | 11.0 |
| Davao del Sur | 2 | 115 | 4 | 17.0 |
| Davao Oriental | 2 | 91 | 8 | 10.0 |
| Surigao del Sur | 3 | 98 | 3 | 5.0 |
| Sub-total | 15 | 671 | 38 | 69.0 |
| Total | 39 | 2343 | 152 | 774.5 |

Note: Number of seed growers and total area for seed production refers only to the study crops concerned in each particular Regions.

Table I.3.9

NUMBER AND AREA OF SEED GROWERS REGION II (1990)

| Province | Municipality/ District | Total No. of Seed Growers | | | | | | Total Area of Land Holding (ha) | | | Total Area for Seed Production (ha) | | | | | | |
|------------|---------------------------|---------------------------|----|------|---|--------|----|------------------------------------|------|--------|-------------------------------------|------|------|-------|--------|-----|------|
| | | Rice | | Corn | | Peanut | | Rice | Corn | Peanut | Rice | | Corn | | Peanut | | |
| | | R | C | R | C | R | C | | | | R | C | R | C | R | C | |
| N. Vizcaya | | 56 | - | - | - | - | - | - | - | - | 149.5 | - | - | - | - | - | |
| | Bambang | 4 | - | - | - | - | - | - | - | - | 21.5 | - | - | - | - | - | |
| | Villaverde | 8 | - | - | - | - | - | - | - | - | 26.5 | - | - | - | - | - | |
| | Bagabag | 11 | - | - | - | - | - | - | - | - | 29.0 | - | - | - | - | - | |
| | Aritao | 6 | - | - | - | - | - | - | - | - | 10.0 | - | - | - | - | - | |
| | Solano | 13 | - | - | - | - | - | - | - | - | 26.0 | - | - | - | - | - | |
| | Bayombong | 9 | - | - | - | - | - | - | - | - | 23.5 | - | - | - | - | - | |
| | Dupax Sur | 4 | - | - | - | - | - | - | - | - | 12.0 | - | - | - | - | - | |
| | Diadi | 1 | - | - | - | - | - | - | - | - | 1.0 | - | - | - | - | - | |
| Isabela | | 10 | 9 | 17 | - | - | 65 | - | - | - | 172.1 | 34.5 | - | 389.0 | - | - | |
| | San Mateo | - | 8 | 6 | - | - | 1 | - | - | - | 48.1 | 7.2 | - | 2.0 | - | - | |
| | Burgos | 1 | - | - | - | - | 5 | - | - | - | 2.5 | - | - | 31.0 | - | - | |
| | Aurora | - | 1 | 4 | - | - | 4 | - | - | - | 47.5 | 18.5 | - | 61.0 | - | - | |
| | Naguilian | - | - | 1 | - | - | 1 | - | - | - | 1.5 | 0.5 | - | 5.0 | - | - | |
| | Cagayan | 1 | - | 2 | - | - | 6 | - | - | - | 6.7 | 2.5 | - | 38.0 | - | - | |
| | San Miguel | 1 | - | - | - | - | - | - | - | - | 19.0 | - | - | - | - | - | |
| | Alicia | - | - | 1 | - | - | 1 | - | - | - | 4.0 | 1.0 | - | 5.0 | - | - | |
| | Echaque | 3 | - | - | - | - | 4 | - | - | - | 7.5 | - | - | 14.0 | - | - | |
| | Andangan | - | - | 1 | - | - | 1 | - | - | - | 13.0 | 2.0 | - | 10.0 | - | - | |
| | Cabatuan | 1 | - | 1 | - | - | 4 | - | - | - | 6.3 | 0.8 | - | 13.0 | - | - | |
| | Santiago | 3 | - | 1 | - | - | 1 | - | - | - | 16.0 | 2.0 | - | 3.0 | - | - | |
| | Jones | - | - | 1 | - | - | 5 | - | - | - | - | - | - | 14.0 | - | - | |
| | Cabagan | - | - | - | - | - | 2 | - | - | - | - | - | - | 9.0 | - | - | |
| | Tumauini | - | - | - | - | - | 6 | - | - | - | - | - | - | 38.0 | - | - | |
| | Delfin Albano | - | - | - | - | - | 3 | - | - | - | - | - | - | 20.0 | - | - | |
| | Ilagan | - | - | - | - | - | 8 | - | - | - | - | - | - | 53.0 | - | - | |
| | San Mariano | - | - | - | - | - | 3 | - | - | - | - | - | - | 21.0 | - | - | |
| | Gamu | - | - | - | - | - | 3 | - | - | - | - | - | - | 8.0 | - | - | |
| | Sta. Maria | - | - | - | - | - | 3 | - | - | - | - | - | - | 25.0 | - | - | |
| | Roxas | - | - | - | - | - | 1 | - | - | - | - | - | - | 10.0 | - | - | |
| | Ramon | - | - | - | - | - | 1 | - | - | - | - | - | - | 2.0 | - | - | |
| | San Isidro | - | - | - | - | - | 1 | - | - | - | - | - | - | 2.0 | - | - | |
| | Quirino | - | - | - | - | - | 1 | - | - | - | - | - | - | 5.0 | - | - | |
| Quirino | | - | 19 | 2 | - | - | 8 | - | - | 9 | 92.0 | 32.0 | 22.0 | - | 66.0 | - | 12.0 |
| | Maddela | - | 1 | - | - | - | 2 | - | - | 9 | 2.0 | 4.0 | 22.0 | - | 1.0 | - | 2.0 |
| | Diffun | - | 12 | 2 | - | - | 5 | - | - | - | 64.0 | 26.0 | - | 44.0 | - | 9.0 | - |
| | Saguday | - | 4 | - | - | - | 1 | - | - | - | 18.0 | 2.0 | - | 15.0 | - | 1.0 | - |
| | Cabarroguis | - | 1 | - | - | - | - | - | - | - | 6.0 | - | - | 5.0 | - | - | - |
| | Aglipay | - | 1 | - | - | - | - | - | - | - | 2.0 | - | - | 1.0 | - | - | - |
| Cagayan | | 36 | - | - | 4 | - | - | - | - | - | 176.0 | - | 4.5 | - | - | - | |
| | Tuguegarao | 2 | - | - | - | - | - | - | - | - | 16.0 | - | - | - | - | - | |
| | Amulong | 2 | - | - | - | - | - | - | - | - | 8.0 | - | - | - | - | - | |
| | Baggao | 2 | - | - | 1 | - | - | - | - | - | 8.0 | - | 1.0 | - | - | - | |
| | Solana | 4 | - | - | - | - | - | - | - | - | 25.0 | - | - | - | - | - | |
| | Tuao | 5 | - | - | 1 | - | - | - | - | - | 26.0 | - | 1.0 | - | - | - | |
| | Piat | 1 | - | - | 2 | - | - | - | - | - | 2.0 | - | 2.5 | - | - | - | |
| | Enrile | 2 | - | - | - | - | - | - | - | - | 18.0 | - | - | - | - | - | |
| | Camalanigan | 1 | - | - | - | - | - | - | - | - | 5.0 | - | - | - | - | - | |
| | Lal-lo | 1 | - | - | - | - | - | - | - | - | 10.0 | - | - | - | - | - | |
| | Gaffasan | 2 | - | - | - | - | - | - | - | - | 10.0 | - | - | - | - | - | |
| | Abulog | 8 | - | - | - | - | - | - | - | - | 31.0 | - | - | - | - | - | |
| | Allacapan | 2 | - | - | - | - | - | - | - | - | 5.0 | - | - | - | - | - | |
| | Appari | 1 | - | - | - | - | - | - | - | - | 3.0 | - | - | - | - | - | |
| | Ballesteros | 2 | - | - | - | - | - | - | - | - | 4.0 | - | - | - | - | - | |
| | Pamplona | 1 | - | - | - | - | - | - | - | - | 5.0 | - | - | - | - | - | |

Note: R = Registered
C = Certified

Table I.3.10 NUMBER AND AREA OF SEED GROWERS, REGION VI (1990)

| Province | Municipality/ District | Total No. of Seed Growers | | | Total Area of Land Holding (ha) | Area for Seed Prod. (ha) | |
|-------------------|---------------------------|------------------------------|----|-----|------------------------------------|-----------------------------|-------|
| | | Rice | | | | Rice | |
| | | R | C | R&C | | R | C |
| Iloilo | | 4 | 26 | 12 | 598.0 | 20.0 | 224.2 |
| | Iloilo City | 1 | | | 13.0 | 2.5 | |
| | Mina | | 1 | | 5.0 | | 5.0 |
| | Sta. Barbara | | 1 | 2 | 72.0 | | 12.6 |
| | Dingle | | 1 | 1 | 10.0 | | 6.0 |
| | Jaro | 1 | 1 | | 54.0 | 4.2 | 7.5 |
| | Anilao | | 1 | | 10.0 | | 4.0 |
| | Dumangas | | 5 | 2 | 88.0 | 2.0 | 53.5 |
| | Leon | | | 1 | 10.0 | | 10.0 |
| | Oton | | 2 | 2 | 64.0 | 1.5 | 26.0 |
| | Manduriao | | 1 | | 5.0 | | 4.0 |
| | Pavia | 1 | 3 | | 36.0 | 1.0 | 4.0 |
| | Januay | | 1 | | 15.0 | | 7.0 |
| | Barotac Nuevo | | 3 | 1 | 65.0 | 1.3 | 44.6 |
| | Barotac Viejo | | 1 | 1 | 18.0 | 1.0 | 4.0 |
| | Zarraga | | 2 | 1 | 26.0 | 1.0 | 13.0 |
| | Pototan | | 2 | | 32.0 | | 18.0 |
| | Ajuy | 1 | 1 | 1 | 80.0 | 5.5 | 5.0 |
| Guimaras | | 1 | 10 | 1 | 111.0 | 2.0 | 40.0 |
| | Jordan | | 2 | | 32.0 | | |
| | Bucnavista | 1 | 8 | 1 | 79.0 | 2.0 | 28.0 |
| Antique | | 1 | 4 | | 109.5 | 1.0 | 37.5 |
| | Culasi | | 1 | | 25.0 | | 9.5 |
| | Patnongon | 1 | | | 20.0 | 1.0 | |
| | Bugasong | | 2 | | 50.0 | | 20 |
| | San Jose | | 1 | | 14.5 | | 8 |
| Capiz | | | 14 | 9 | 174.0 | 10.5 | 92.3 |
| | Mambusao | | 1 | 1 | 20.0 | 2.0 | 10.8 |
| | Sigma | | 2 | 3 | 47.0 | 2.5 | 27 |
| | Panit-an | | 1 | | 6.0 | | 2.0 |
| | Panay | | | 2 | 16.0 | 2.0 | 10.0 |
| | Cuartero | | 5 | 3 | 41.0 | 4.0 | 28.5 |
| | Dao | | 2 | | 24.0 | | 3.0 |
| | Dumalag | | 2 | | 15.0 | | 3.0 |
| | Dumarao | | 1 | | 5.0 | | 8.0 |
| Aklan | | | 13 | 5 | 149.0 | 9.5 | 46.5 |
| | Numancia | | 3 | 1 | 67.0 | 3.5 | 17.0 |
| | Makato | | 1 | | 5.0 | 1.0 | |
| | Lezo | | | 2 | 7.0 | | 3.0 |
| | Tangalan | | 1 | | 3.0 | | 2.5 |
| | New Washington | | 4 | 1 | 31.5 | 3.0 | 11.0 |
| | Kalibo | | 1 | 1 | 17.5 | 2.0 | 10.0 |
| | Banga | | 2 | | 15.0 | | 2.0 |
| | Ibajay | | 1 | | 3.0 | | 1.0 |
| Negros Occidental | | | 5 | | 72.0 | | 60.0 |
| | Magalona | | 3 | | 37.0 | | 30.0 |
| | Silay | | 1 | | 30.0 | | 25.0 |
| | La Carlota | | 1 | | 5.0 | | 5.0 |

Note: R = Registered
C = Certified

Table I.3.11 NUMBER AND AREA OF SEED GROWERS, REGION XI (1990)

| Province | Municipality/ District | Total No. of Seed Growers | | | | | | Total Area of Land Holding (ha) | | Total Area for Seed Production (ha) | | | |
|-----------------|---------------------------|---------------------------|----|-----|------|----|-----|------------------------------------|------|-------------------------------------|-------|------|------|
| | | Rice | | | Corn | | | Rice | Corn | Rice | | Corn | |
| | | R | C | R&C | R | C | R&C | | | R | C | R | C |
| South Cotabato | | | 73 | 5 | | 19 | | 326.0 | | 26.0 | 214.8 | | 26.0 |
| | Koronadal | | 2 | 5 | | | | 58.0 | | 26.0 | 34.0 | | |
| | Tantangan | | 7 | | | | | 26.0 | | | 17.8 | | |
| | Banga | | 14 | | | 5 | | 65.0 | | | 43.0 | | 7.0 |
| | Surallah | | 6 | | | 1 | | 16.0 | | | 10.8 | | 1.0 |
| | Sto. Nino | | 8 | | | 3 | | 35.0 | | | 27.0 | | 3.0 |
| | Norala | | 17 | | | 7 | | 53.0 | | | 39.3 | | 8.0 |
| | Tupi | | 4 | | | 1 | | 11.0 | | | 7.0 | | 5.0 |
| | Kiamba | | 3 | | | | | 12.0 | | | 7.0 | | |
| | Maitum | | 12 | | | | | 50.0 | | | 29.0 | | |
| | Polomolok | | | | | 2 | | | | | | | 2.0 |
| Davao City | | | | 4 | | 4 | | 40.0 | 6.0 | 4.0 | 24.0 | | 11.0 |
| | Calinan | | | 2 | | 1 | | 20.0 | | 2.0 | 12.0 | | 5.0 |
| | Talomo | | | | | 1 | | | 3.0 | | | | 3.0 |
| | Davao City | | | 2 | | 2 | | 20.0 | 3.0 | 2.0 | 12.0 | | 3.0 |
| Davao del Sur | | | 3 | 11 | | 4 | | 83.6 | 7.0 | 13.0 | 67.04 | | 17.0 |
| | Magsaysay | | 1 | 3 | | 3 | | 12.0 | 7.0 | 3.0 | 10.0 | | 7.0 |
| | Bansalan | | | 1 | | | | 5.6 | | 1.0 | 4.0 | | |
| | Hagonoy | | 1 | 5 | | | | 51.0 | | 6.0 | 45.0 | | |
| | Digos | | 1 | 2 | | | | 11.0 | | 3.0 | 8.0 | | |
| | Malita | | | | | 1 | | 4.0 | | | | | 4.0 |
| Davao del Norte | | 33 | | | | | | 139.3 | | 139.3 | | | |
| | Compostela | 6 | | | | | | 30.5 | | 30.5 | | | |
| | New Bataan | 1 | | | | | | 1.5 | | 1.5 | | | |
| | Nabunturan | 4 | | | | | | 19.0 | | 19.0 | | | |
| | Mawab | 2 | | | | | | 6.8 | | 6.8 | | | |
| | New Corella | 5 | | | | | | 12.4 | | 12.4 | | | |
| | Sto. Tomas | 2 | | | | | | 12.5 | | 12.5 | | | |
| | Panabo | 4 | | | | | | 9.7 | | 9.7 | | | |
| | Carmen | 2 | | | | | | 3.0 | | 3.0 | | | |
| | Kapalong | 1 | | | | | | 12.2 | | 12.2 | | | |
| | Asuncion | 4 | | | | | | 27.2 | | 27.2 | | | |
| | Maco | 1 | | | | | | 2.5 | | 2.5 | | | |
| | Mabini | 1 | | | | | | 2.0 | | 2.0 | | | |
| Surigao del Sur | | 43 | | 14 | 3 | | | 219.0 | | 88.0 | 17.0 | 5.0 | |
| | Bayabas | | | 1 | | | | 8.0 | | 1.0 | 2.0 | | |
| | Caquait | 2 | | 1 | | | | 14.0 | | 7.0 | 1.0 | | |
| | Liangá | 3 | | | | | | 4.0 | | 2.0 | | | |
| | San Agustin | 1 | | | | | | 2.0 | | 1.0 | | | |
| | Barbaro | 2 | | | | | | 7.0 | | 3.0 | | | |
| | Hinatuan | 2 | | | | | | 10.0 | | 4.0 | | | |
| | Bislig | 1 | | | | | | 2.0 | | 1.0 | | | |
| | Tandag | 3 | | | 1 | | | 7.0 | | 3.0 | | 2.0 | |
| | Tago | 3 | | 4 | | | | 35.0 | | 9.0 | 5.0 | | |
| | San Miquel | 2 | | 8 | 2 | | | 42.0 | | 12.0 | 9.0 | 3.0 | |
| | Madrid | 13 | | | | | | 42.0 | | 22.0 | | | |
| | Cantillan | 4 | | | | | | 17.0 | | 9.0 | | | |
| | Carrascal | 1 | | | | | | 2.0 | | 1.0 | | | |
| | Carmen | 5 | | | | | | 22.0 | | 11.0 | | | |
| | Lanuza | 1 | | | | | | 5.0 | | 2.0 | | | |
| Davao Oriental | | | 35 | | 8 | | | 111.0 | 5.0 | | 83.8 | | 10.0 |
| | Banay-banay | | 33 | | 1 | | | 92.0 | 2.0 | | 71.8 | | 1.0 |
| | Baganga | | 1 | | 2 | | | 4.0 | | | 2.0 | | 2.0 |
| | Lupon | | 1 | | 2 | | | 15.0 | 3.0 | | 10.0 | | 4.0 |
| | Cateel | | | | 1 | | | | | | | | 1.0 |
| | Caraga | | | | 1 | | | | | | | | 1.0 |
| | Gov. Generoso | | | | 1 | | | | | | | | 1.0 |

Note: R = Registered
C = Certified

**Table I.3.12 PRESENT CROP BUDGET FOR PEANUT SEED PER HECTARE
(REGION II)**

| Item | Unit | Wet Season | | | Dry Season | | | Unit: Peso |
|-----------------------------|--------|-----------------|------------|--------|------------|------------|--------|------------|
| | | Q'ty | Unit Price | Amount | Q'ty | Unit Price | Amount | |
| | | A. Gross Income | | | | | | |
| - Yield | t | 1.1 | 11,000 | 12,100 | 1.2 | 10,200 | 12,240 | |
| B. Production Cost | | | | | | | | |
| 1. Material Input | | | | | | | | |
| - Seed | kg | 167 | 10 | 1,670 | 144 | 11 | 1,585 | |
| - Fertilizer | | | | | | | | |
| - Agro-chemical Insecticide | lit. | 0.12 | 210 | 25 | 0.12 | 210 | 25 | |
| Sub-total | | | | 1,695 | | | 1,610 | |
| 2. Labor Input | | | | | | | | |
| man-day | | 134 | 35 | 4,690 | 134 | 35 | 4,690 | |
| animal-day | | 48 | 35 | 1,680 | 48 | 35 | 1,680 | |
| machine hour | | - | - | - | - | - | - | |
| Sub-total | | | | 6,370 | | | 6,370 | |
| 3. Others* | | | | 120 | | | 120 | |
| 4. Land Tax | | | | 60 | | | 60 | |
| C. Net Return (A - B) | (P/ha) | | | 3,855 | | | 4,080 | |
| D. Net Profit Ratio (C/B) | | | | 0.5 | | | 0.5 | |

Note: Wet Season = May - October
Dry Season = October - April

Source: Seedgrowers Interview Survey, 1990

* 1% of the gross value of production

**Table I.3.13 PRESENT CROP BUDGET FOR RICE SEED PER HECTARE
(REGION VI)**

| | | Unit: Peso | | | | | |
|---------------------------|--------------|------------|------------|--------|------------|------------|--------|
| Item | Unit | Wet Season | | | Dry Season | | |
| | | Q'ty | Unit Price | Amount | Q'ty | Unit Price | Amount |
| A. Gross Income | | | | | | | |
| - Yield | t | 3.6 | 6,670 | 24,010 | 3.4 | 6,670 | 22,680 |
| B. Production Cost | | | | | | | |
| 1. Material Input | | | | | | | |
| - Seed | kg | 50.6 | 7.8 | 395 | 53.9 | 8 | 445 |
| - Fertilizer | bag | | | | | | |
| Urea | | 1.8 | 200 | 360 | 2 | 200 | 400 |
| 16-20-0 | | 1.4 | 223 | 310 | 1.7 | 223 | 380 |
| 14-14-14 | | 1.8 | 237 | 425 | 1.7 | 237 | 405 |
| 16-16-16 | | 0.4 | 289 | 115 | 0.4 | 289 | 115 |
| 21-0-0 | | 0.2 | 180 | 35 | 0.3 | 180 | 55 |
| - Agro-chemical | lit. | | | | | | |
| Insecticide | | 1.3 | 216 | 280 | 1.4 | 223 | 310 |
| Herbicides | | 1.6 | 225 | 360 | 1.3 | 260 | 340 |
| Sub-total | | | | 2,280 | | | 2,245 |
| 2. Labor Input | | | | | | | |
| man-day | man-day | 105 | 35 | 3,675 | 105 | 35 | 3,675 |
| animal-day | animal-day | 6 | 35 | 210 | 6 | 35 | 210 |
| machine hour | machine hour | 11 | 175 | 1,925 | 11 | 175 | 1,925 |
| Sub-total | | | | 5,810 | | | 5,810 |
| 3. Others* | | | | 240 | | | 225 |
| 4. Irrigation Fee | kg | 100 | 5 | 500 | 150 | 5 | 750 |
| 5. Land Tax | | | | 80 | | | 80 |
| C. Net Return (A - B) | (P/ha) | | | 15,100 | | | 13,365 |
| D. Net Profit Ratio (C/B) | | | | 1.7 | | | 1.4 |

Note: Wet Season = May - October
Dry Season = October - April

Source: Seedgrowers Interview Survey, 1990

* 1% of the gross value of production

**Table I.3.14 PRESENT CROP BUDGET FOR CORN SEED PER HECTARE
(REGION XI)**

| | | Unit: Peso | | | | | |
|---------------------------|--------------|------------|------------|--------|------------|------------|--------|
| Item | Unit | Wet Season | | | Dry Season | | |
| | | Q'ty | Unit Price | Amount | Q'ty | Unit Price | Amount |
| A. Gross Income | | | | | | | |
| - Yield | t | 2.2 | 1,330 | 29,260 | 2.3 | 13,300 | 30,590 |
| B. Production Cost | | | | | | | |
| 1. Material Input | | | | | | | |
| - Seed | kg | 30 | 13.35 | 400 | 30 | 13.35 | 400 |
| - Fertilizer | bag | | | | | | |
| Urea | | 3.7 | 215 | 795 | 3.7 | 215 | 795 |
| 14-14-14 | | 4.7 | 238 | 1,120 | 4.7 | 238.00 | 1,120 |
| 16-20-0 | | 0.7 | 235 | 165 | 0.7 | 235.00 | 165 |
| - Agro-chemical | lit. | | | | | | |
| Insecticide | | 2.9 | 305 | 885 | 2.9 | 305 | 885 |
| Herbicides | | 2.8 | 197 | 530 | 2.8 | 190 | 530 |
| Sub-total | | | | 3,895 | | | 3,895 |
| 2. Labor Input | | | | | | | |
| man-day | man-day | 124 | 40 | 4,960 | 124 | 40 | 4,960 |
| animal-day | animal-day | 27 | 35 | 945 | 27 | 35 | 945 |
| machine hour | machine hour | 4 | 250 | 1,000 | 4 | 250 | 1,000 |
| Sub-total | | | | 6,905 | | | 6,905 |
| 3. Others* | | | | 295 | | | 305 |
| 4. Land Tax | | | | 65 | | | 65 |
| C. Net Return (A - B) | (P/ha) | | | 18,100 | | | 19,420 |
| D. Net Profit Ratio (C/B) | | | | 1.6 | | | 1.7 |

Note: Wet Season = May - October
Dry Season = October - April

Source: Seedgrowers Interview Survey, 1990

* 1% of the gross value of production

Table I.3.15 PRESENT FARM BUDGET FOR PEANUT, RICE AND CORN SEED GROWERS, 1989

| Item | Unit | Region II (Peanut Seed) | Region VI (Rice Seed) | Region XI (Corn Seed) |
|----------------------|------|----------------------------|--------------------------|--------------------------|
| Family Size | | 6 | 6 | 6 |
| Farm Size (Average) | (ha) | 0.68 | 7.72 | 1.42 |
| Cropping Intensity | (%) | 278 | 183 | 194 |
| I. Farm Income | P | | | |
| Gross Income | P | 24,200 | 355,655 | 82,235 |
| Production Cost | P | 14,585 | 128,495 | 30,705 |
| Net Income | P | 9,615 | 207,160 | 51,530 |
| II. Off-farm Income | P | 1,551 | 8,890 | 5,000 |
| III. Non-farm Income | P | 9,650 | 55,450 | 11,335 |
| IV. Total Income | P | | | |
| I + II + III | | 20,815 | 282,500 | 67,865 |

Source : Seed Growers Interview Survey, 1990

Table I.3.16 FUTURE CROP BUDGET FOR PEANUT SEED PER HECTARE, (REGION II)

| Unit: Peso | | | | |
|---------------------------|-------|------|------------|--------|
| Item | Unit | Q'ty | Unit Price | Amount |
| A. Gross Income | | | | |
| – Yield | (t) | 1.0 | 23,000 | 23,000 |
| B. Production Cost | | | | 7,559 |
| 1. Material Input | | | | |
| – Seed | (kg) | 100 | 23 | 2,300 |
| – Fertilizer | | | | |
| 14-14-14 | (bag) | 2 | 237 | 474 |
| – Agro-chemical | | | | |
| Fungicide | (kg) | 1 | 220 | 220 |
| Insecticide | (lit) | 1 | 210 | 210 |
| Sub-total | | | | 3,204 |
| 2. Labor Input | | | | |
| man-day | | 85 | 35 | 2,975 |
| animal-day | | 14 | 35 | 490 |
| machine hour | | 4 | 150 | 600 |
| Sub-total | | | | 4,065 |
| 3. Land tax | | | | 60 |
| 4. Others * | | | | 230 |
| C. Net Return (A–B) | | | | 15,441 |
| D. Net-Profit Ratio (C/B) | | | | 2.0 |

Note: * 1% of the gross value of production

Table I.3.17 FUTURE CROP BUDGET FOR RICE SEED PER HECTARE, (REGION VI)

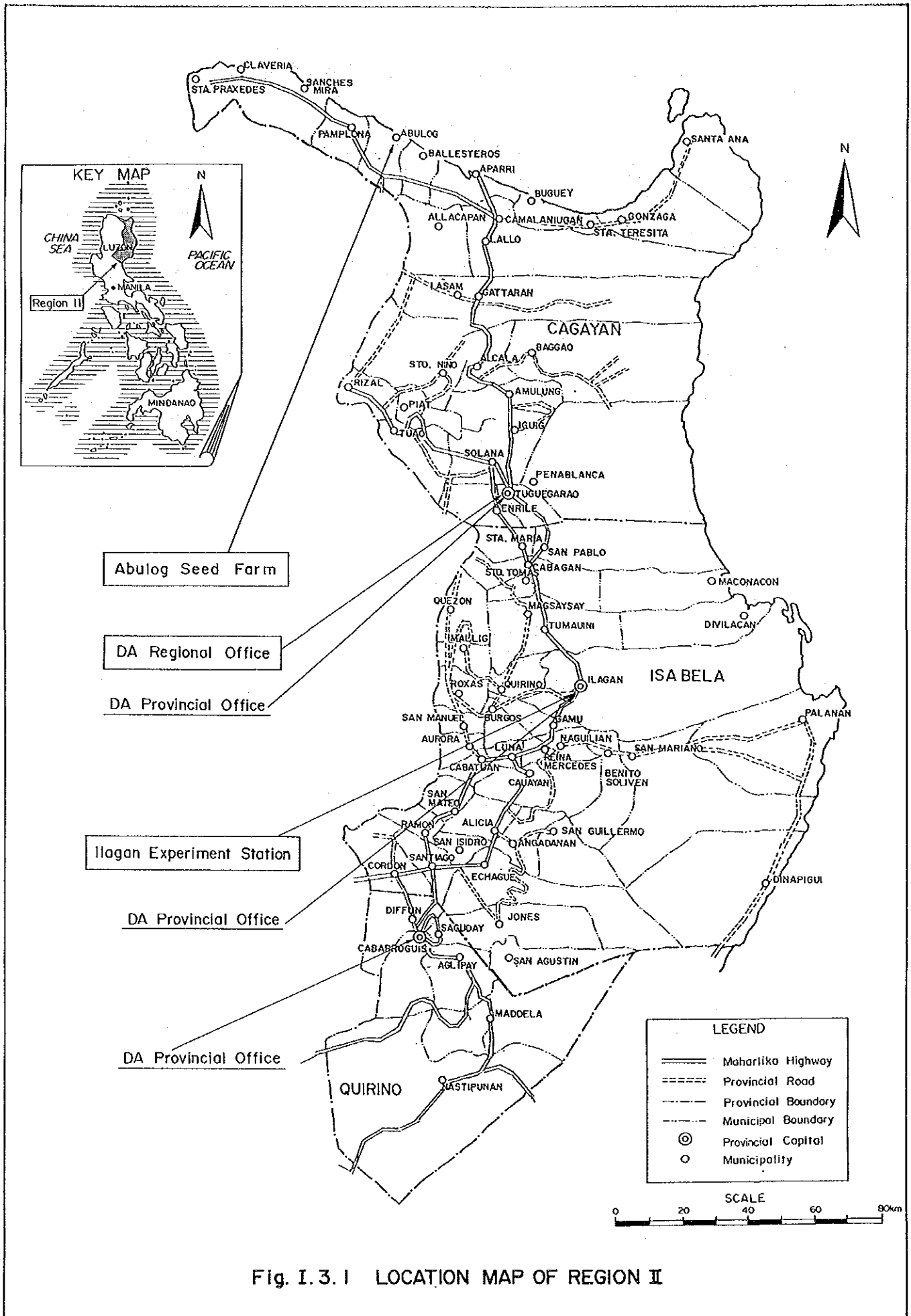
| Unit: Peso | | | | |
|---------------------------|-------|------|------------|--------|
| Item | Unit | Q'ty | Unit Price | Amount |
| A. Gross Income | | | | |
| – Yield | (t) | 3.6 | 8,300 | 29,880 |
| B. Production Cost | | | | 9,586 |
| 1. Material Input | | | | |
| – Seed | (kg) | 45 | 8.3 | 374 |
| – Fertilizer | | | | |
| Urea | (bag) | 3 | 200 | 600 |
| 16-20-0 | (bag) | 1.5 | 223 | 335 |
| 14-14-14 | (bag) | 1.8 | 237 | 427 |
| – Agro-chemicals | | | | |
| Insecticide | (lit) | 1.5 | 220 | 330 |
| Herbicides | (lit) | 1.5 | 240 | 360 |
| Sub-total | | | | 2,426 |
| 2. Labor Input | | | | |
| man-day | | 105 | 35 | 3,675 |
| animal-day | | 10 | 35 | 350 |
| machine hour | | 11 | 175 | 1,925 |
| Sub-total | | | | 5,950 |
| 3. Irrigation Fee | (kg) | 100 | 8.3 | 830 |
| 4. Land tax | | | | 80 |
| 5. Others * | | – | – | 300 |
| C. Net Return (A-B) | | | | 20,294 |
| D. Net-Profit Ratio (C/B) | | | | 2.1 |

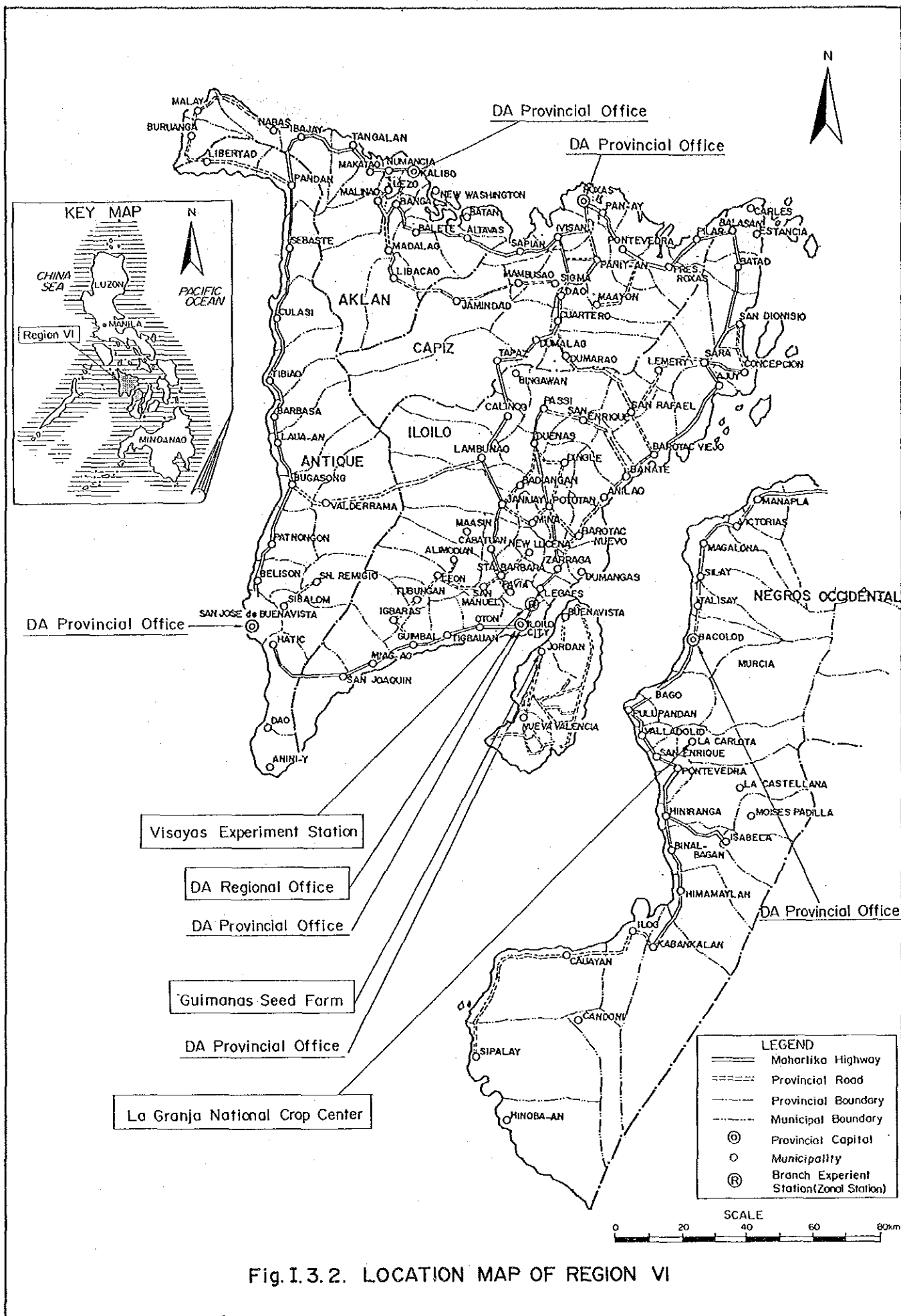
Note: * 1% of the gross value of production

Table I.3.18 FUTURE CROP BUDGET FOR CORN SEED PER HECTARE, (REGION XI)

| Unit: Peso | | | | |
|---------------------------|-------|------|------------|--------|
| Item | Unit | Q'ty | Unit Price | Amount |
| A. Gross Income | | | | |
| - Yield | (t) | 3.0 | 17,000 | 51,000 |
| B. Production Cost | | | | 10,543 |
| 1. Material Input | | | | |
| - Seed | (kg) | 20 | 17 | 340 |
| - Fertilizer | | | | |
| Urea | (bag) | 1 | 215 | 215 |
| 16-20-0 | (bag) | 2 | 235 | 470 |
| 14-14-14 | (bag) | 6 | 238 | 1,428 |
| - Agro-chemicals | | | | |
| Insecticide | (lit) | 2 | 305 | 610 |
| Sub-total | | | | 3,063 |
| 2. Labor Input | | | | |
| man-day | | 124 | 40 | 4,960 |
| animal-day | | 27 | 35 | 945 |
| machine hour | | 4 | 250 | 1,000 |
| Sub-total | | | | 6,905 |
| 3. Land tax | | | | 65 |
| 4. Others * | | | | 510 |
| C. Net Return (A-B) | | | | 40,457 |
| D. Net-Profit Ratio (C/B) | | | | 3.8 |

Note: * 1% of the gross value of production





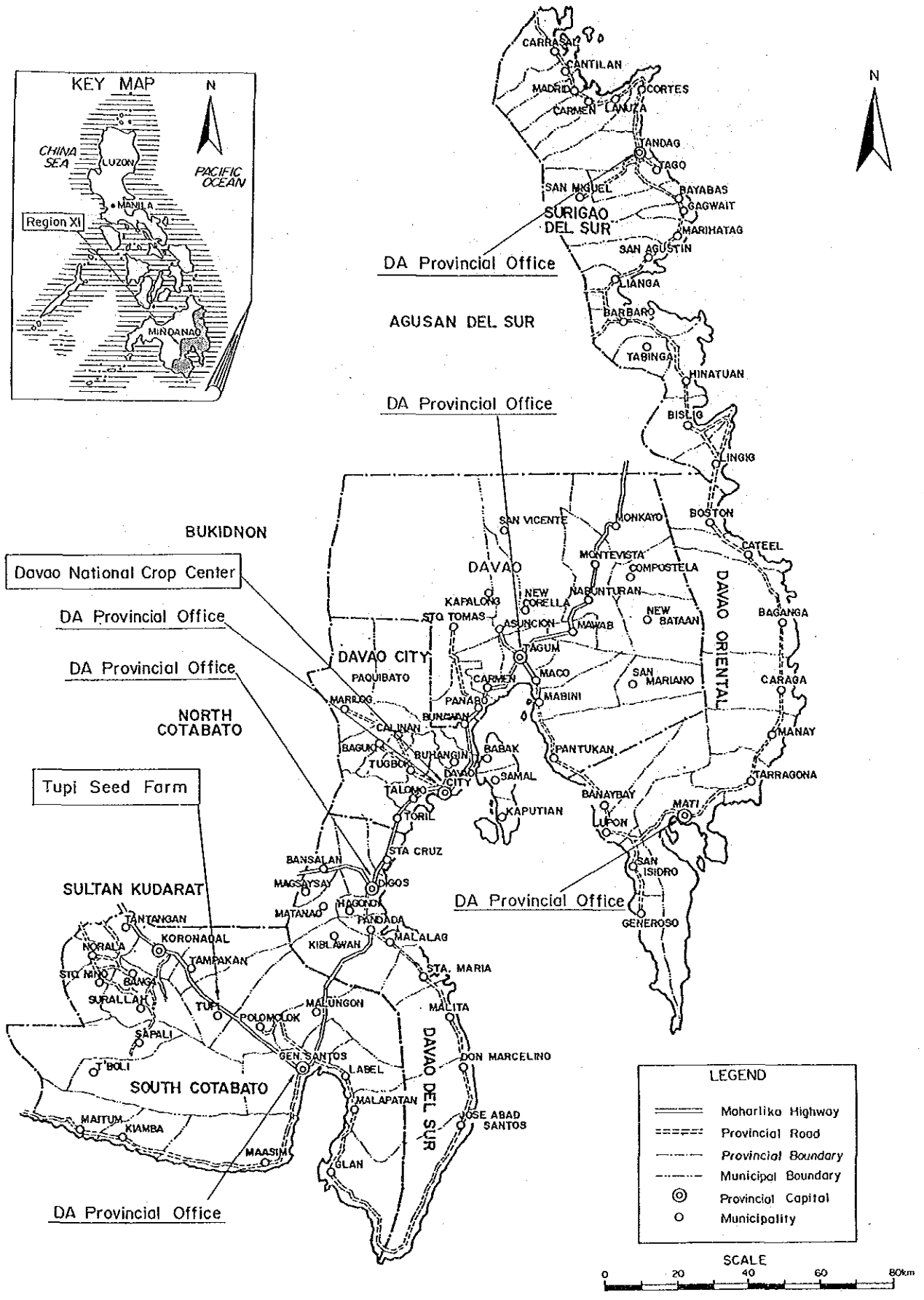
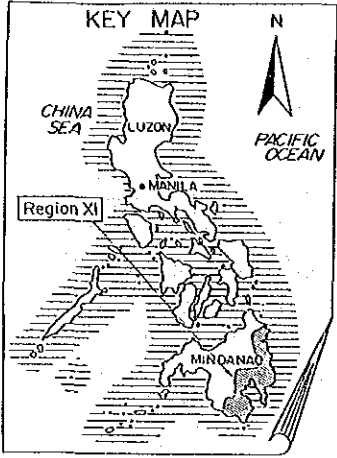


Fig. I.3.3 LOCATION MAP OF REGION XI

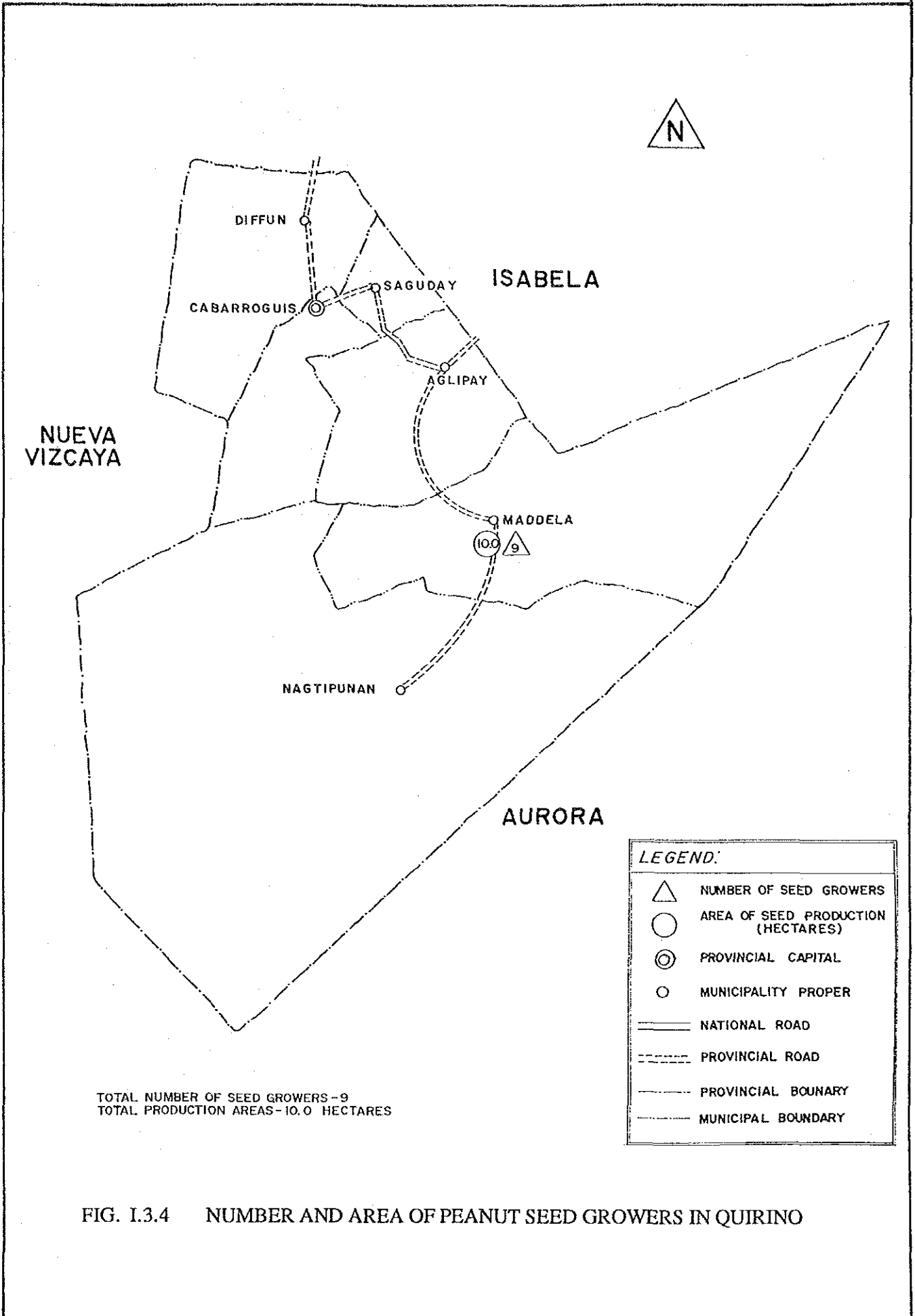


FIG. I.3.4 NUMBER AND AREA OF PEANUT SEED GROWERS IN QUIRINO

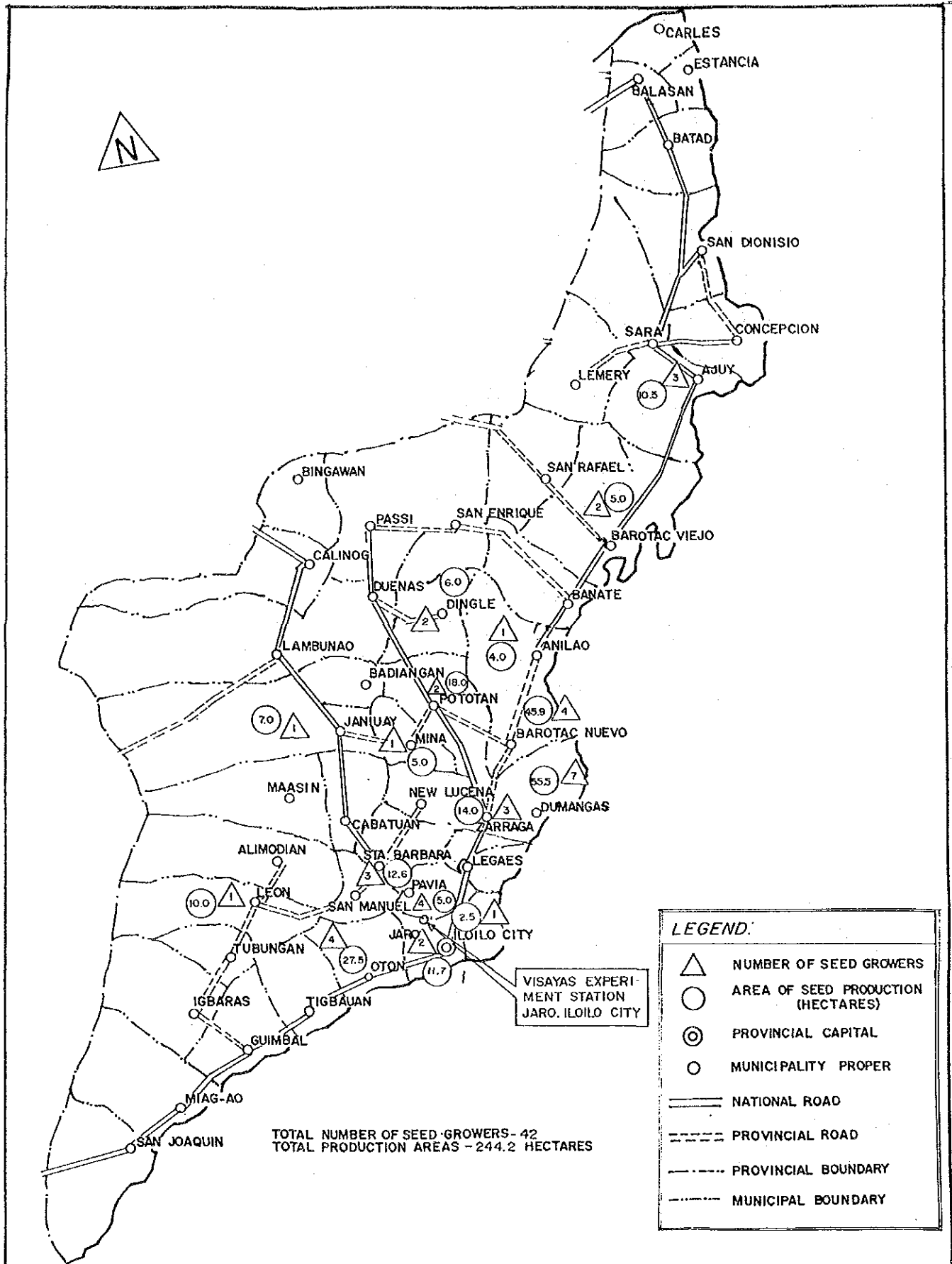


FIG. I.3.5 NUMBER AND AREA OF RICE SEED GROWERS IN ILOILO

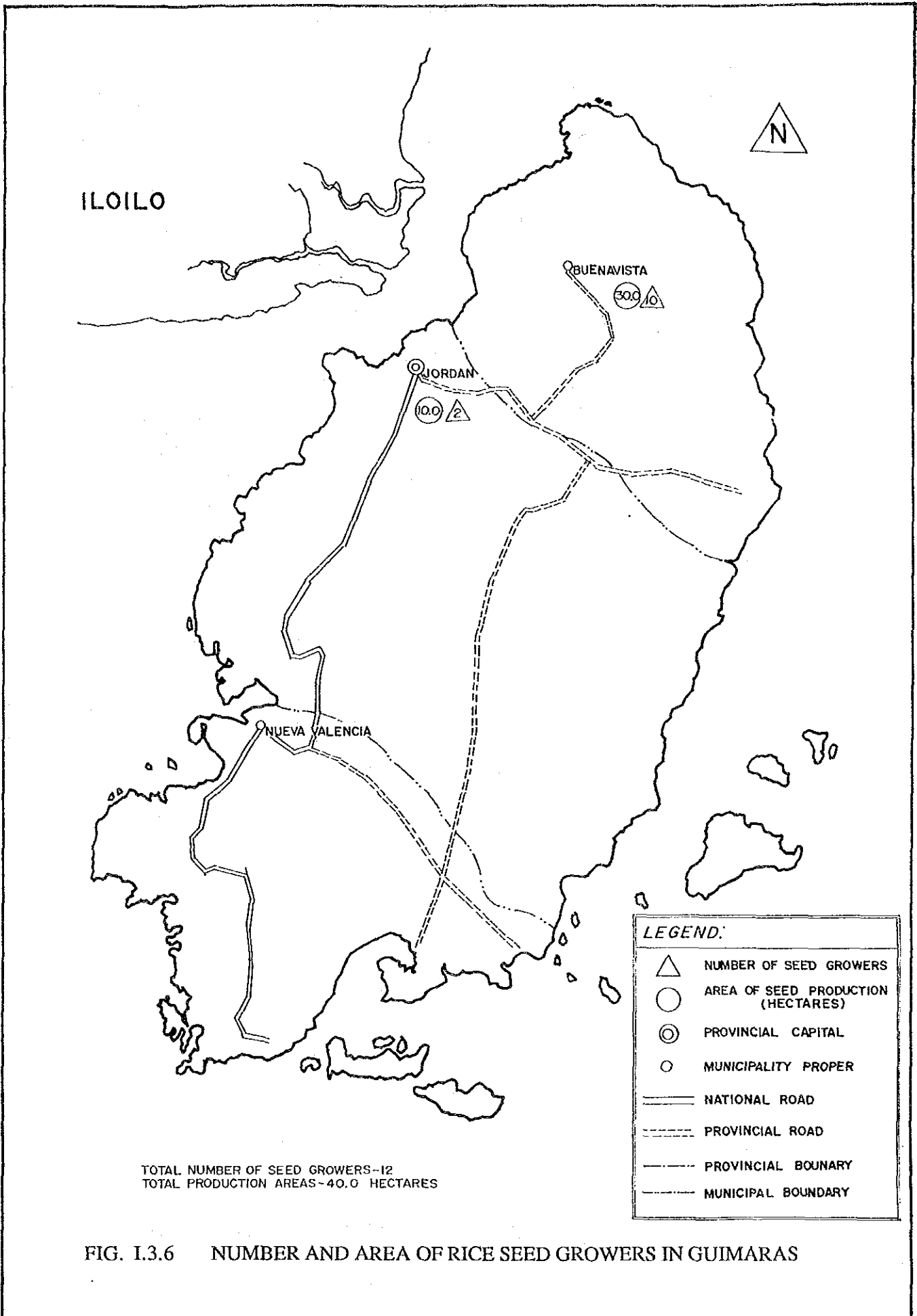


FIG. I.3.6 NUMBER AND AREA OF RICE SEED GROWERS IN GUIMARAS

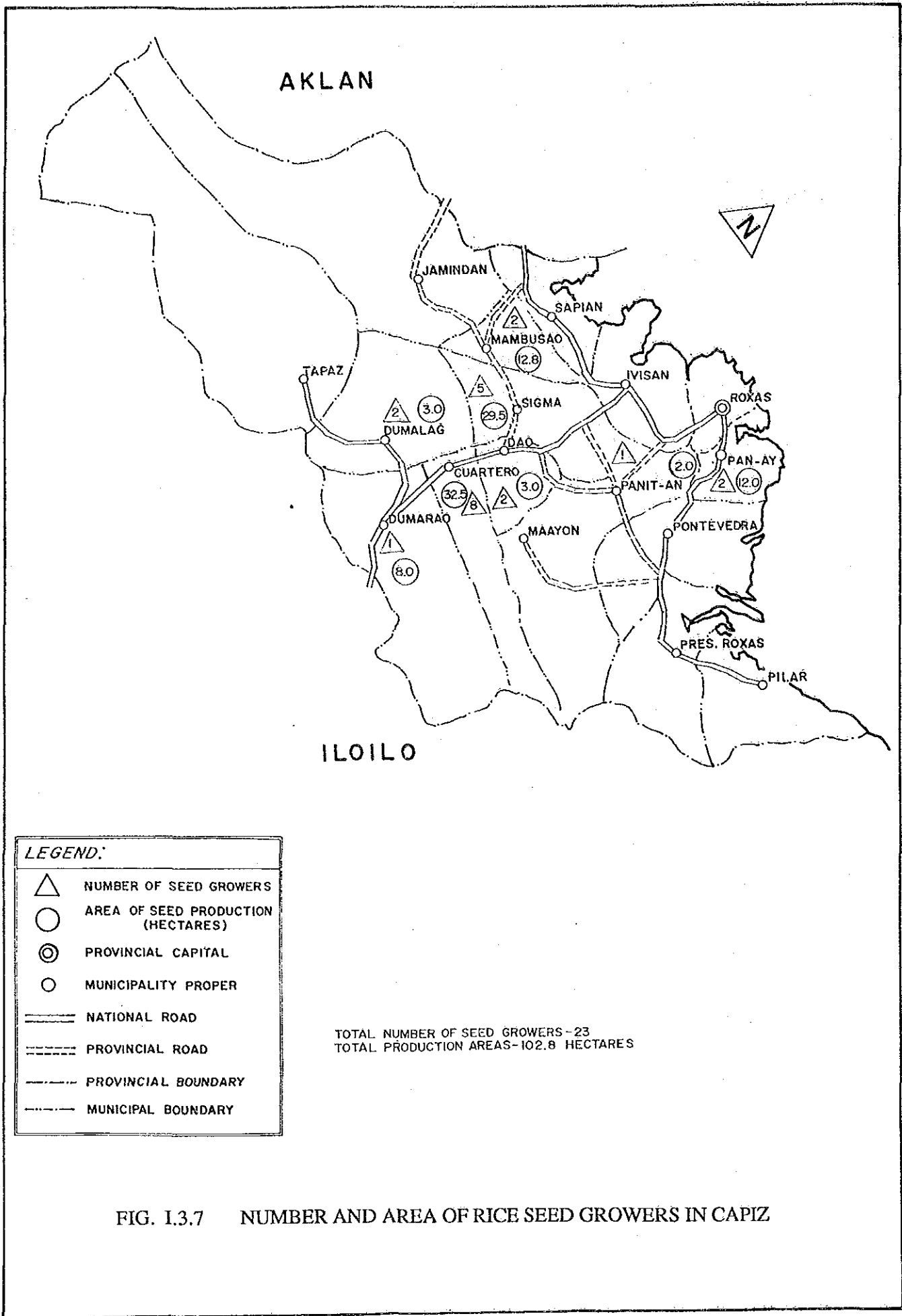


FIG. I.3.7 NUMBER AND AREA OF RICE SEED GROWERS IN CAPIZ

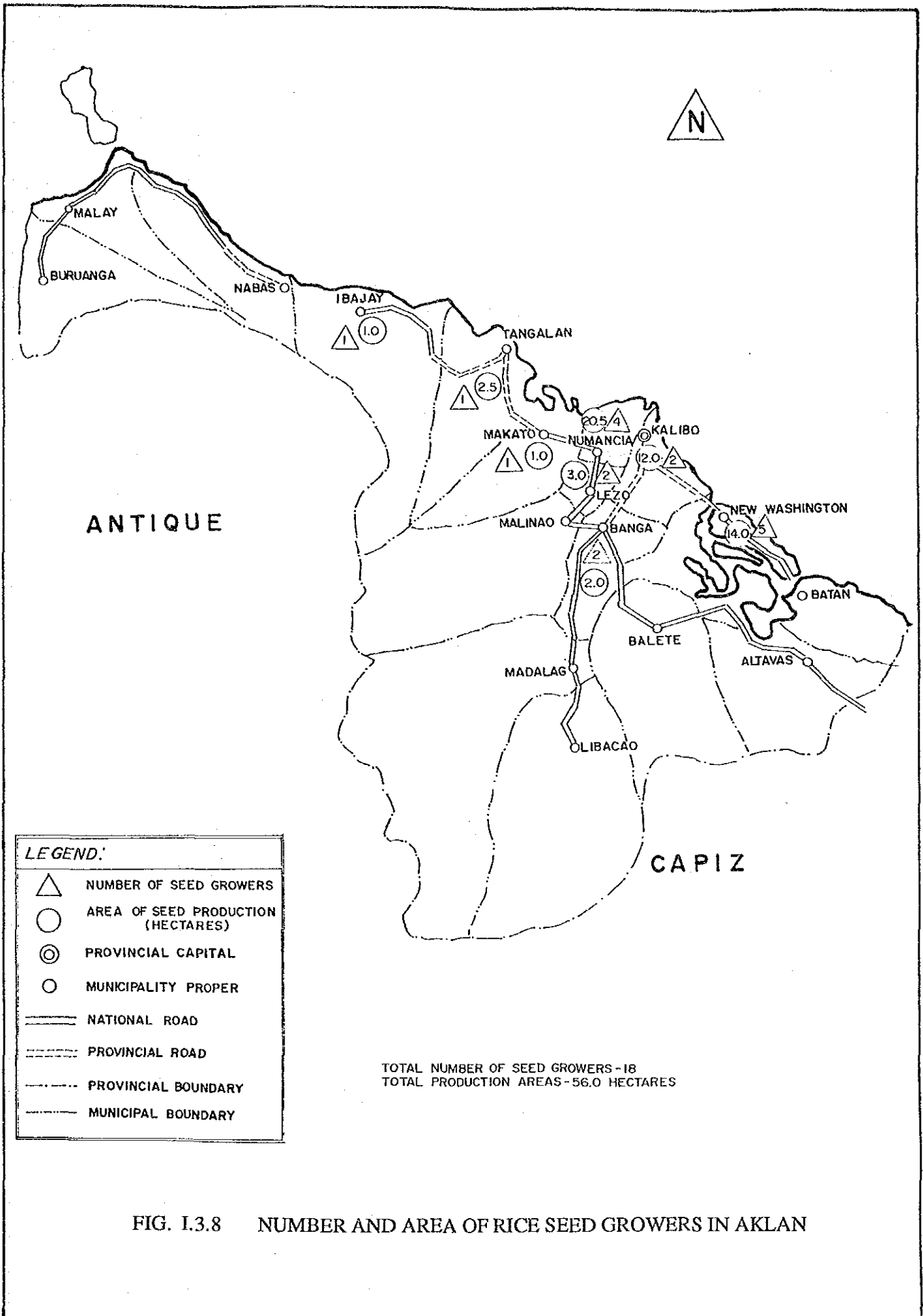


FIG. I.3.8 NUMBER AND AREA OF RICE SEED GROWERS IN AKLAN

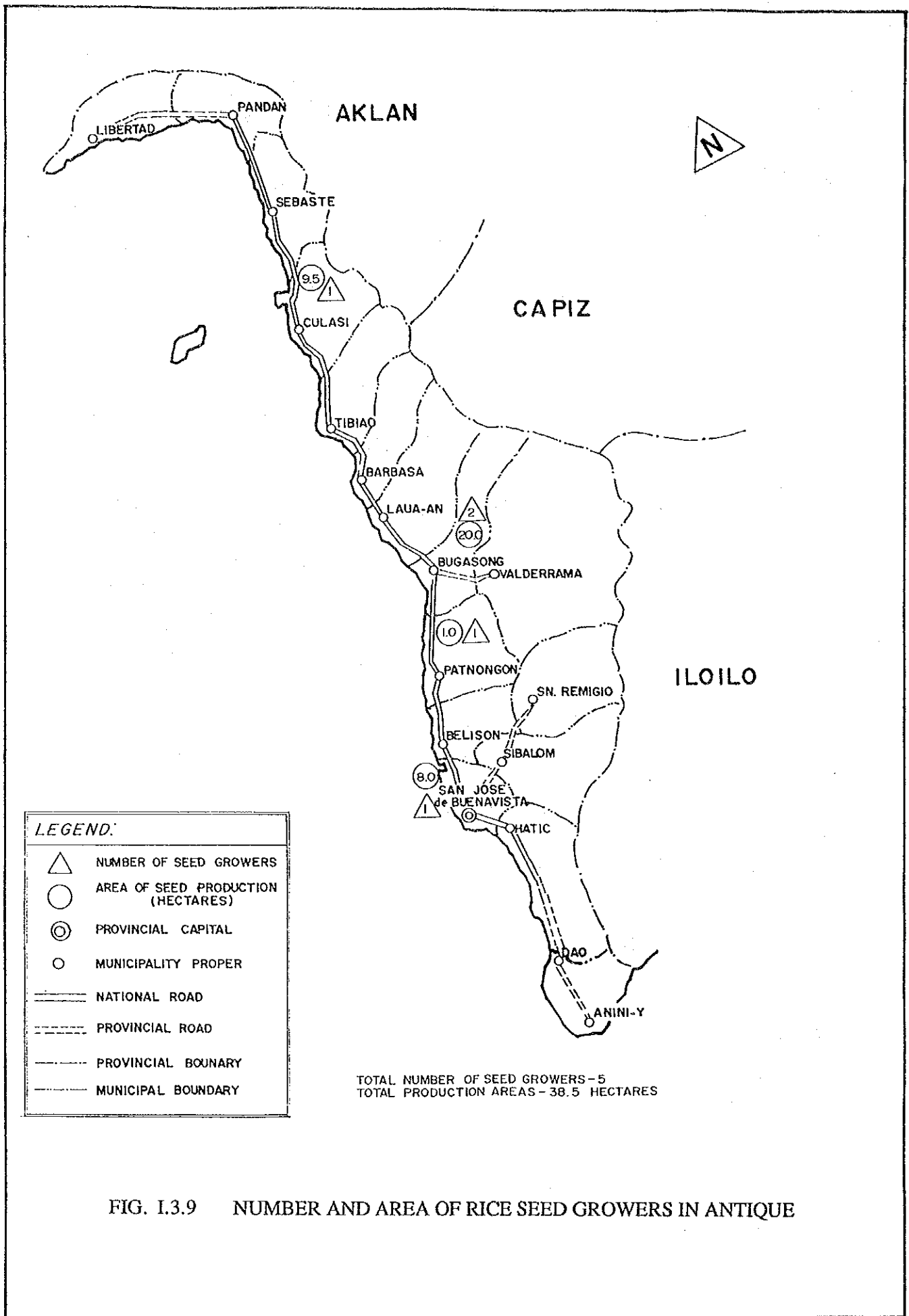


FIG. I.3.9 NUMBER AND AREA OF RICE SEED GROWERS IN ANTIQUE

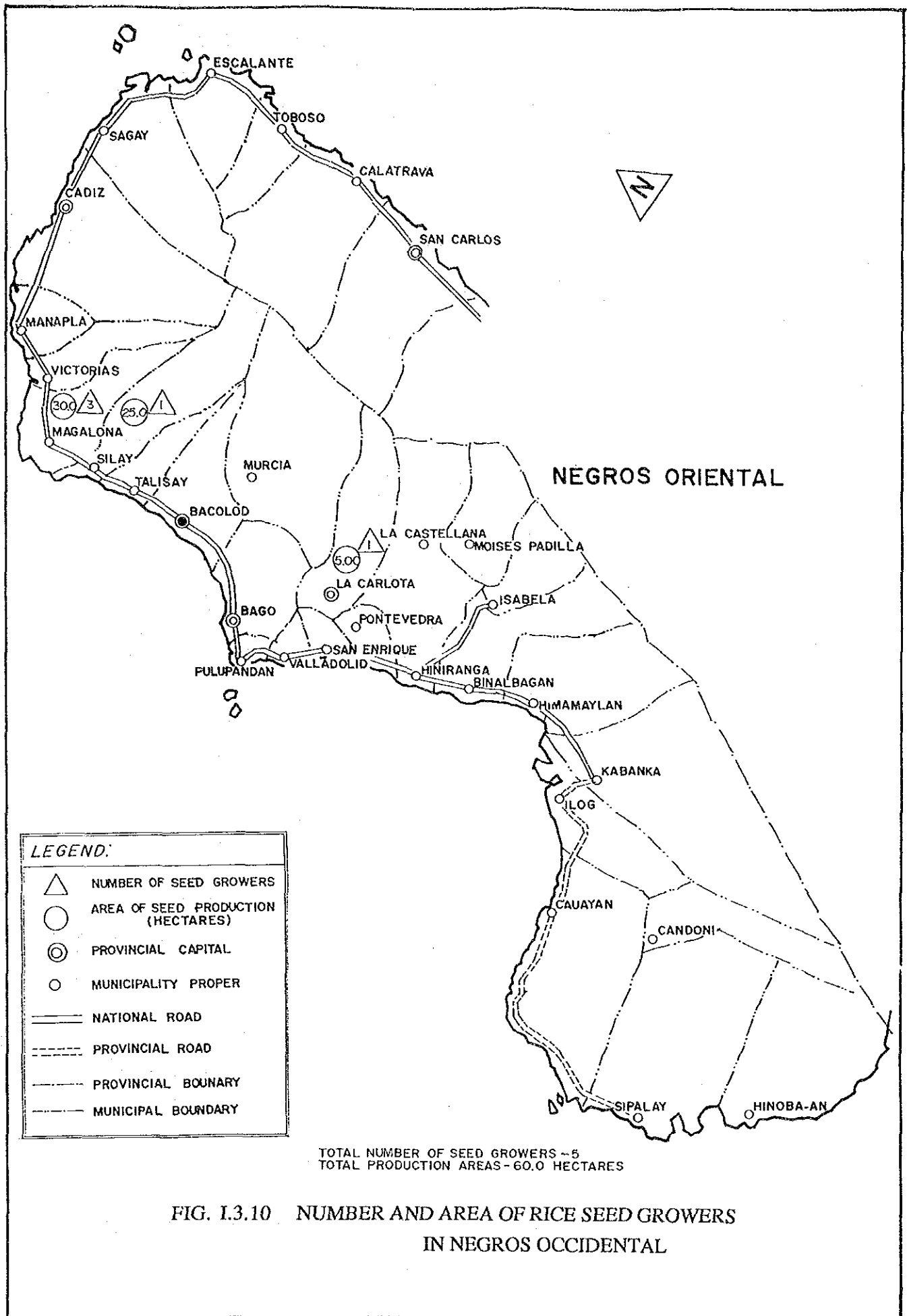


FIG. I.3.10 NUMBER AND AREA OF RICE SEED GROWERS
 IN NEGROS OCCIDENTAL

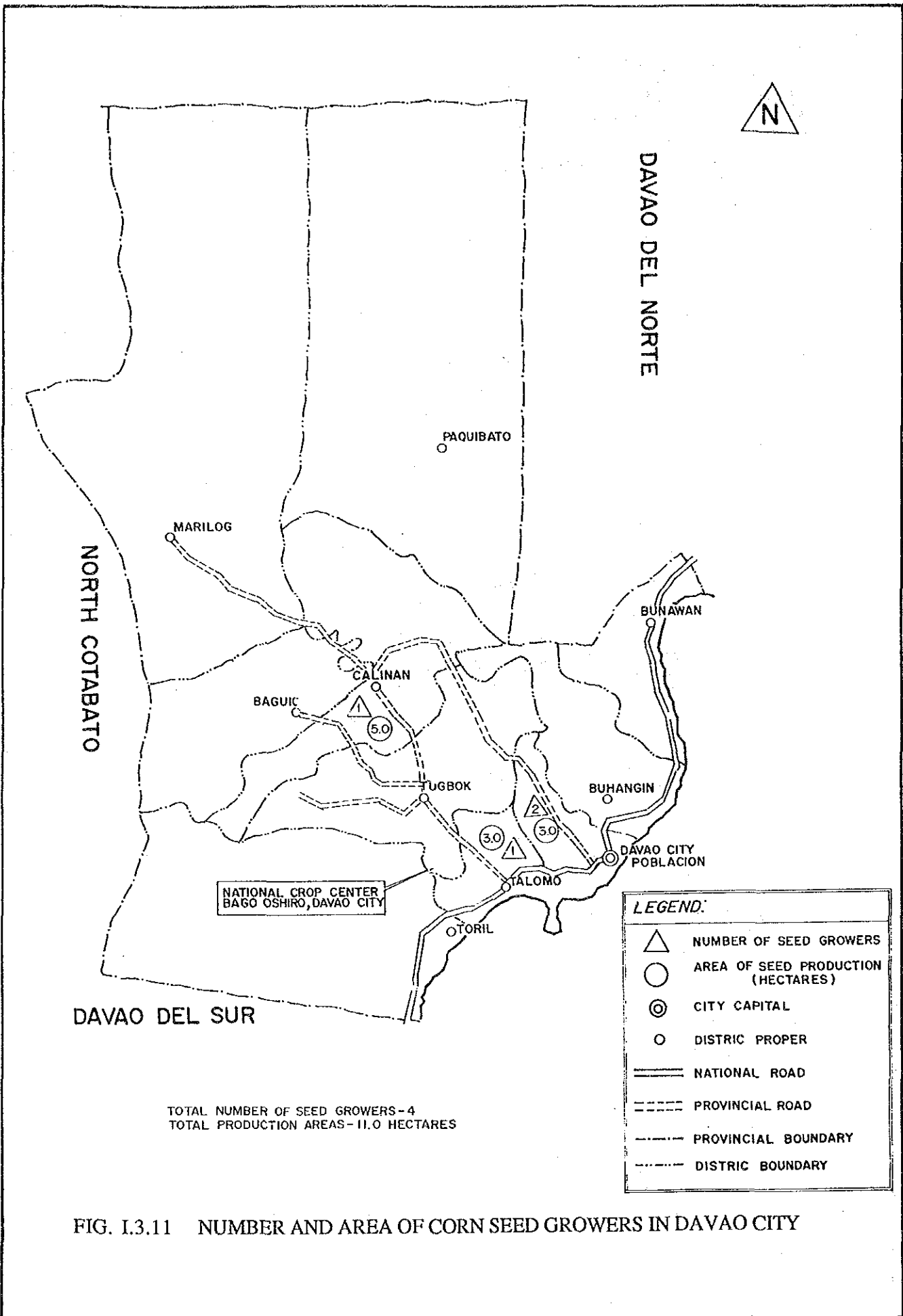


FIG. I.3.11 NUMBER AND AREA OF CORN SEED GROWERS IN DAVAO CITY

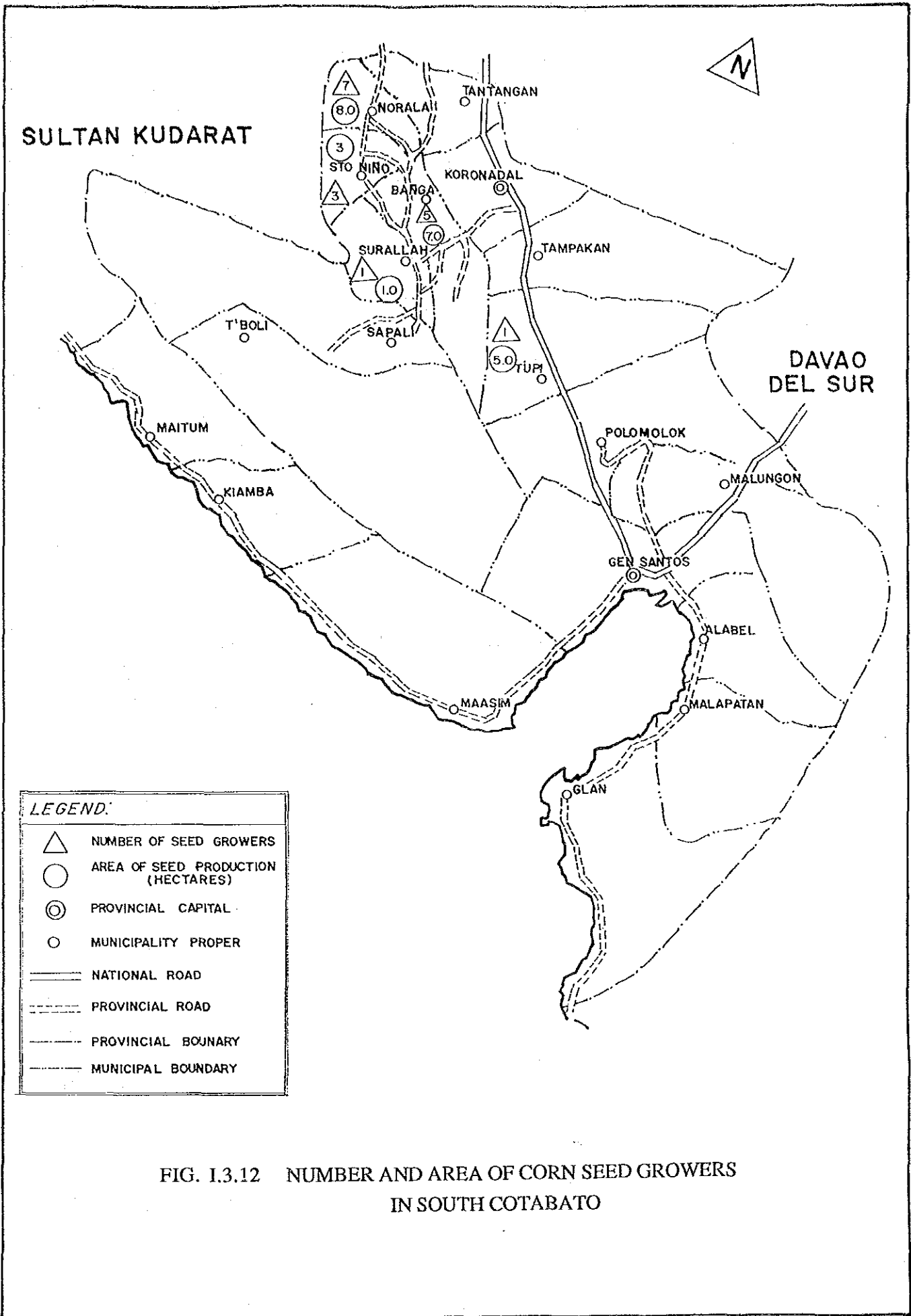


FIG. I.3.12 NUMBER AND AREA OF CORN SEED GROWERS IN SOUTH COTABATO

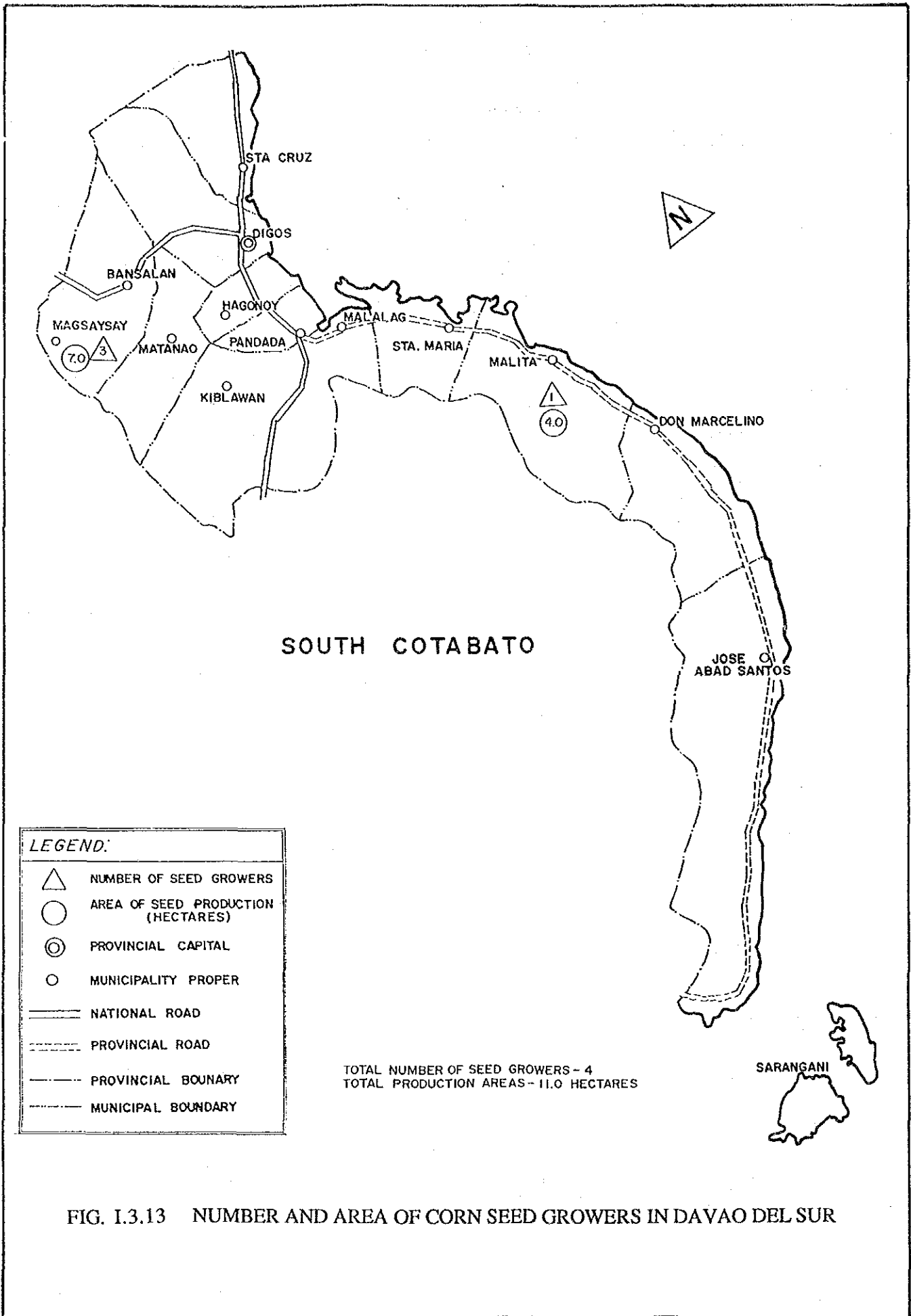


FIG. I.3.13 NUMBER AND AREA OF CORN SEED GROWERS IN DAVAO DEL SUR

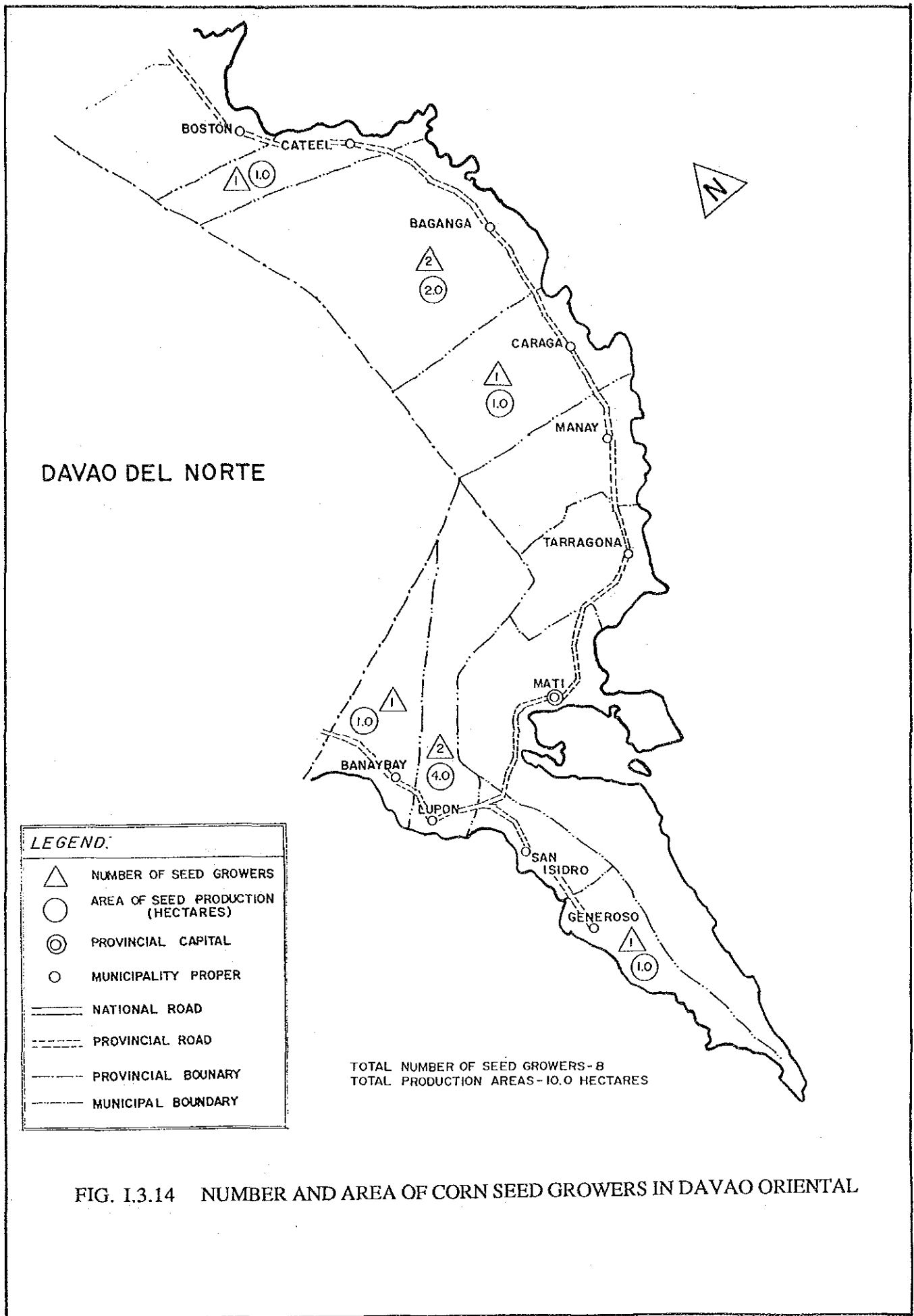


FIG. I.3.14 NUMBER AND AREA OF CORN SEED GROWERS IN DAVAO ORIENTAL

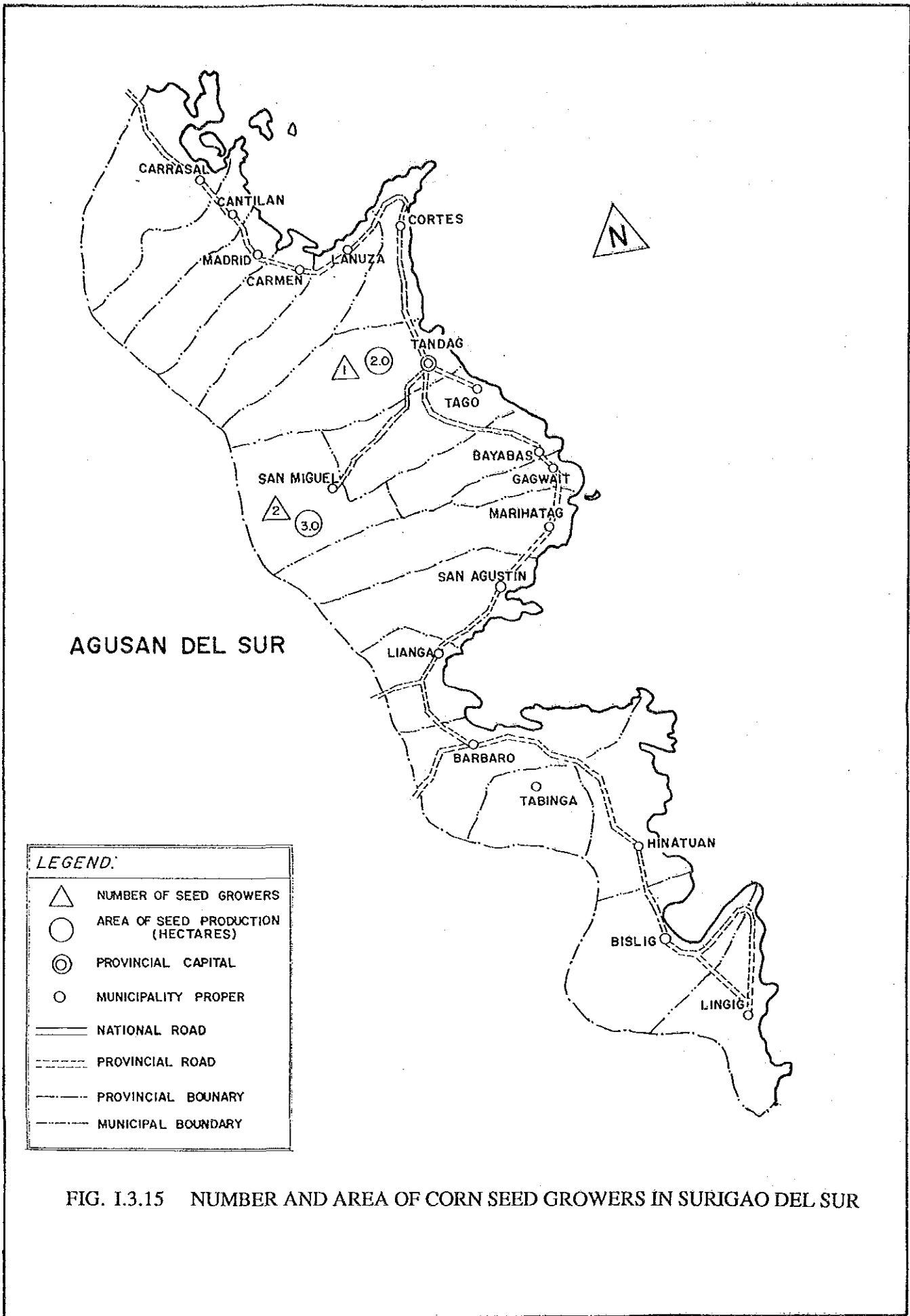


FIG. 1.3.15 NUMBER AND AREA OF CORN SEED GROWERS IN SURIGAO DEL SUR

*Feasibility Study on
Improvement of Seed Production and Distribution, and
Establishment of Appropriate Seed Storage System*

Annex J
Project Evaluation

FEASIBILITY STUDY ON
IMPROVEMENT OF SEED PRODUCTION AND DISTRIBUTION, AND
ESTABLISHMENT OF
APPROPRIATE SEED STORAGE SYSTEM

ANNEX J PROJECT EVALUATION

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1. SOCIOECONOMIC CONDITIONS OF MODEL AREAS

1.1 Reginal Economy

Table J.1.1 presents Gross Reginal Domestic Product (GRDP) by Region from 1987 to 1989 at current prices and constant 1972 prices. In total Philippines and regions which include Model Area of the Project, average annual growth rate of GRDP and per capita GRDP were as shown in below. All Regions which include Model Area had a smaller growth rate than the whole Philippines. In regards of per Capita GRDP in 1989, only Region XI exceeded the national average but Region II and VI were lower. This presupposes behindhand in the economic development of these two Regions.

Annual Growth Rate of GRDP in 1987 to 1989 and Per Capita GRDP in 1989

| | Growth Rate | Per Capita GRDP |
|-------------|-------------|-----------------|
| Philippines | 6.1 % | 6,300 pesos |
| Region II | 3.8 | 9,600 |
| Region VI | 4.4 | 14,500 |
| Region XI | 4.1 | 13,700 |

Table J.1.2 presents Gross Value Added (GVA) in the agriculture sector by Region from 1987 to 1989 at current prices and constant 1972 prices. The following table shows the average annual growth rate of GVA in the agriculture sector and share of agriculture in GRDP in constant prices. Industries of Regions which include the model area are characterized to depend on the agriculture sector. In particular, share of agriculture in Region II were over 50%, and its growth rate was higher than the national average.

Annual Growth Rate of GVA in Agriculture in 1987-1989 and Share of Agriculture in GRDP

| | Growth Rate | Share |
|-------------|-------------|--------|
| Philippines | 3.8 % | 28.1 % |
| Region II | 4.5 | 58.4 |
| Region VI | 2.6 | 41.8 |
| Region XI | 2.1 | 47.5 |

GRDP by industry group is shown in Table J.1.3-J.1.6. Agriculture sector is the most important in Region II and Region XI, and the second in Region VI. Particularly agricultural crop sector has a large share in the GRDP, 41% in Region II, 20% in Region VI and 37% in Region XI.

1.2 Labor Force

Table J.1.7 presents household population 15 years old and over by employment status by Region in 1988. Share of agriculture in employees are as shown in the following. All the figures are higher than the share in GRDP; agriculture has an important role to give employment opportunity.

| Share of Agriculture in Employment | |
|------------------------------------|--------|
| Philippines | 46.3 % |
| Region II | 63.9 |
| Region VI | 57.1 |
| Region XI | 56.9 |

The country's 1988 unemployment rate was 4.2%. By Region, the lowest unemployment rate of 1.9% was registered in Region II. Unemployment rate in Region VI and Region XI were 2.5% and 3.8%, lower than the country's average.

2. FINANCIAL STATE OF INSTITUTE CONCERNED

2.1 Government Budget

Budget of Department of Agriculture (DA) in 1987 to 1990 are as shown in Table J.2.1. The Total budget of DA is increasing continuously, and the annual growth rate in 1987 to 1990 was 16.5%. In DA, regional operations are provided the most budget; this presupposes progress of rocalization by policy of the government.

Table J.2.2 presents the budget of Bureau of Plant Industry (BPI) from 1987 to 1990, and total budget of BPI was decreased from 1988. In particular, the budget for production of seeds and plant materials decreased continuously; its share in BPI decreased from 37% in 1987 to 21% in 1990.

Income from the sale of seeds and plant materials should be deposited in the revolving fund for procurement of more seeds and plant materials. Government institutes concerned to produce seeds and plant materials can't use their earnings, and required money is allocated from the budget of the government.

However, often the budget is untimely released to appropriate mangement of seed production and quality control,. This is one reason of the low productivity of seeds.

2.2 Agricultural Credit System

Most part of ordinary farmers are of small scale and poor. In order to promote appropriate utilization of certified seeds, financial assistance to small farmers should be required. The government has policies and strategies to provide appropriate agricultural credit systems involving the bank and the farmer.

The Agricultural Credit Policy Council (ACPC) was created, along with a package of policy and strategy. The purpose of ACPC is to formulate and support policies and programs that will encourage the financial system to respond to the requirement of rural and agricultural development. A particular goal is to increase access of small farmers to timely, adequate financing. The ACPC is one of DA's attached agencies, and tasked to serve as the government's overall coordinator and policy analyst of rural and agricultural financing.

The Comprehensive Agricultural Loan Fund (CALF) was also created at the same time and is managed by ACPC. The CALF is a pool of integrated funds for various programs previously implemented by DA. The CALF works as a guarantee fund.

Most part of the agricultural production loans are lent by the private banks; its share was 81% in 1989. In the government banks, Philippine National Bank (PNB), Development Bank of the Philippines (DBP) and Land Bank of the Philippines (LBP) serve agricultural production loans. In particular, farm credit released by LBP was expanded in 1989.

Usually, farmers borrow agricultural production loans through their cooperatives. According to interview survey of farmers in Region VI, the interest rate of the agricultural credit is 12% per annum, and members of cooperative pay 6% more of charge to the cooperative.

3. FINANCIAL EVALUATION

3.1 Financial Evaluation of Project Implementation

3.1.1 Cost

(1) Basic Assumptions for Cost Estimation

1) Unit Price and Foreign Exchange Rate

Unit price used in cost estimation was as of July 1990, and foreign exchange rates were as follows :

US\$ 1.00 = P 24.00 US\$ 1.00 = ¥150.00
P 1.00 = ¥6.25

2) Estimation of Construction Cost

Construction would be done by contract basis, and expenses for construction machinery would be included in the contract.

3) Cost for Design and Supervising

For design and supervising for construction, 10% of the construction cost was added.

4) Contingencies

Physical contingency cost was made an appropriation of 10% of the construction cost for change in construction volume. For change in price, price contingency cost was added 5% of foreign cost and 10% of local cost.

(2) Construction Cost

Table J.3.1 shows the construction cost of each model area and total project. This evaluation, however, aims to analyze financial viability of the model improvement plan which covers object crop seeds, i.e. peanut, rice and corn. Therefore, the cost concerning facilities which are used in common were allocated by share of utilization. The rates of cost allocation used are as shown below. The construction cost for object crop seeds are as shown in Table J.3.2.

| | Rates of Cost Allocation | | |
|-------------------------------------|--------------------------|-----------|----------------------------|
| | Region II | Region VI | Region XI |
| Farm Machine Building and Equipment | 0.15 | 0.53 | 0.32 (shared by farm land) |
| for Seed Quality Control | 0.12 | 0.97 | 0.24 (shared by samples) |

Design works should be carried out in the first year and construction works should be done in the second year. The construction cost is summarized as follows.

Construction Cost by Year for Model Improvement Plan

unit =1000 pesos

| | Local Cost | Foreign Cost | Total | Local Cost | Foreign Cost | Total |
|---------------------------|---------------|----------------|----------------|---------------|----------------|----------------|
| Region II (Peanut) | | | | | | |
| 1st year | 1,644 | 5,225 | 6,869 | 1,245 | 4,124 | 5,369 |
| 2nd year | 19,729 | 60,084 | 79,813 | 14,943 | 47,421 | 62,364 |
| Total | 21,373 | 65,309 | 86,682 | 16,188 | 51,545 | 67,733 |
| Region VI (Rice) | | | | | | |
| 1st year | 2,652 | 8,145 | 10,797 | 2,627 | 8,044 | 10,671 |
| 2nd year | 31,825 | 93,669 | 125,494 | 31,526 | 92,506 | 124,032 |
| Total | 34,477 | 101,814 | 136,291 | 34,153 | 100,550 | 134,703 |
| Region XI (Corn) | | | | | | |
| 1st year | 2,153 | 7,376 | 9,529 | 1,821 | 6,517 | 8,338 |
| 2nd year | 25,838 | 84,828 | 110,666 | 21,848 | 74,950 | 96,798 |
| Total | 27,991 | 92,204 | 120,195 | 23,669 | 81,467 | 105,136 |
| Total | | | | | | |
| 1st year | 6,449 | 20,746 | 27,195 | 5,693 | 18,685 | 24,378 |
| 2nd year | 77,392 | 238,581 | 315,973 | 68,317 | 214,877 | 283,194 |
| Total | 83,841 | 259,327 | 343,168 | 74,010 | 233,562 | 307,572 |

(3) Annual Operation and Maintenance Cost

1) Seed Production Cost

Cost for input seeds in seed production is the internal cost of the project; therefore, the cost excluded is the seed production cost. Seed production cost per hectare is shown in Table J.3.3 and summarized as below.

| Seed Production Cost | | | |
|------------------------|--------------|--------------|--------------|
| Unit: '000 pesos | | | |
| | Peanut | Rice | Corn |
| Fertilizers | 474 | 1,362 | 2,113 |
| Agricultural Chemicals | 430 | 690 | 630 |
| Labor Cost | 4,065 | 5,950 | 6,905 |
| Total | 4,969 | 8,002 | 9,648 |

In each seed farm, annual seed production cost was estimated as follows.

Annual Seed Production Cost by Farm

| Region | Farm | Production Area | Production Cost |
|-----------|-----------------|-----------------|-----------------|
| Region II | Ilagan E.S. | 16.0 | 80 |
| | Seed Growers | 260.0 | 1,292 |
| | Sub-total | 276.1 | 1,372 |
| Region VI | Visayas E.S. | 23.2 | 186 |
| | Seed Growers | 1,786.4 | 14,295 |
| | Sub-total | 1,809.6 | 14,481 |
| Region XI | Davao NCC | 6.0 | 58 |
| | Manambulan S.F. | 4.0 | 39 |
| | Tupi E.S. | 12.0 | 116 |
| | Seed Growers | 526.5 | 5,080 |
| | Sub-total | 548.5 | 5,293 |
| Total | | 2,634.2 | 21,146 |

2) Operation and Maintenance Cost

Operation and maintenance cost consist maintenance and repairing cost for facility operation cost, excluding seed production cost and personnel expenses for project management, including seed quality control. Required number of personnel is shown in Table J.3.4. And the following assumptions were used to estimate operation and maintenance cost.

Operation Cost

| | |
|---------------------------------|-----------------------------------|
| Irrigation Facilities: | Fuel consumption of pumps |
| Pre and Post Harvest Machinery: | Fuel and electric consumption |
| Quality Control Equipment: | 25% of construction cost |
| Electricity: | Electric consumption in buildings |

Maintenance and Repairing Cost

| | |
|---------------------------------|---------------------------|
| Irrigation Facilities: | 0.5% of construction cost |
| Pre and Post Harvest Machinery: | 7% of construction cost |
| Quality Control Equipment: | 7% of construction cost |
| Buildings: | 0.5% of construction cost |

For financial evaluation, operation and maintenance costs were allocated for object crop seeds as the same as the construction cost, also. Retails of operation and maintenance costs are as shown in Table J.3.5 and summarized in the following.

Annual Operation and Mintenance Cost

Unit: 1000 pesos

| Item | Total Cost | | | | Cost for Object Crop Seed | | | |
|-----------------------------------|------------|-------|-------|--------|---------------------------|-------|-------|--------|
| | Peanut | Rice | Corn | Total | Peanut | Rice | Corn | Total |
| Operation Cost | 3,361 | 2,812 | 3,049 | 9,222 | 1,779 | 2,719 | 1,902 | 6,400 |
| Maintenance and Repairing Cost | 1,979 | 3,431 | 2,306 | 7,716 | 1,381 | 3,358 | 1,873 | 6,612 |
| Personnel Expenses | 1,536 | 1,581 | 1,275 | 4,392 | 322 | 1,539 | 438 | 2,299 |
| Total | 6,876 | 7,824 | 6,630 | 21,330 | 3,482 | 7,616 | 4,213 | 15,311 |

3) Depreciation Cost

Depreciation cost was estimated by the straight-line method. Life periods were assumed to be 10 years for machinery and equipment, and 20 years for buildings. And residual value after life period was assumed to be zero. Depreciation cost was estimated as shown below.

| | Depreciation Cost | | | | | |
|--------------------|-------------------|--------|--------|---------------------------|--------|--------|
| | Unit: 1000 pesos | | | | | |
| | Total Cost | | | Cost for Object Crop Seed | | |
| | Machinery | Others | Total | Machinery | Others | Total |
| Region II (Peanut) | 3,119 | 3,451 | 6,570 | 2,187 | 3,044 | 5,231 |
| Region VI (Rice) | 4,407 | 4,072 | 8,479 | 4,289 | 4,057 | 8,346 |
| Region XI (Corn) | 1,216 | 4,925 | 6,141 | 550 | 4,566 | 5,116 |
| Total | 8,742 | 12,448 | 21,190 | 7,026 | 11,667 | 18,693 |

3.1.2 Income

Income of the model improvement plan consist of seed sale, seed test, field inspection and charge for machinery. The selling price of seeds, and charge for seed test and field inspection are determined by the government. Charge for machinery was assumed to cover operation cost.

The estimated annual income was as shown in Table J.3.6 and summarized as below.

| | | <u>Annual Income</u> |
|-----------|----------|----------------------|
| Region II | (Peanut) | 438 thousand pesos |
| Region VI | (Rice) | 1,147 |
| Region XI | (Corn) | 777 |
| Total | | 2,362 |

3.1.3 Evaluation

In comparison to income with cost, income can cover only the seed production cost. Even though depreciation cost is excluded, a large amount of deficit is supposed to operate the model improvement plan. Table J.3.7 shows the cost. Annual operation and maintenance cost are summerized as follows.

Annual Operation Maintenance Cost

Unit: '000 pesos

| | Region II | Region VI | Region XI | Total |
|------------------------------|-----------|-----------|-----------|--------|
| Seed Production Cost | 80 | 186 | 213 | 479 |
| Operation & Maintenance Cost | 3,482 | 7,616 | 4,213 | 15,311 |
| Sub-total | 3,562 | 7,802 | 4,426 | 15,790 |
| Depreciation Cost | 5,231 | 8,346 | 5,116 | 18,693 |
| Total | 8,793 | 16,148 | 9,542 | 34,483 |

Seed production is conducted by the government budget as a basic infrastructure of agricultural production. In order to manage the model plan, the following budget should be required by the government.

Annual Budget by the Government

Unit: '000 pesos

| | Region II | Region VI | Region XI | Total |
|---------------|-----------|-----------|-----------|--------|
| Income | 438 | 1,147 | 777 | 2,362 |
| Expenditure | 3,562 | 7,802 | 4,426 | 15,790 |
| Budget Needed | 3,124 | 6,655 | 3,649 | 13,428 |

Official price of seeds are not different in class, even economic value increases in order of certified seed, registered seed and foundation seed. Public sector will lose because they have a role in the upper stream of seed production.

3.2 Financial Analysis of Seed Growers

Profitability per hectare in seed growers is as shown in the following. Net income of seed production will increase 11,586 pesos for peanut, 5,194 pesos for rice and 22,357 pesos for corn. Seed growers will make great profit inspite of loss in public sector.

Cooperation of seed growers will be needed to supply sufficient seed required in model areas. Profitability of seed production should be assured in order to give them intensiveness for seed production. However, appropriate profit share systems should be developed to reduce loss in public sector.

| Productivity in Seed Growers | | | Unit: pesos/ha |
|------------------------------|-----------------|--------------|------------------|
| | Without Project | With Project | Increased Profit |
| Peanut | | | |
| Production | 12,100 | 23,000 | |
| Cost | 8,245 | 7,559 | |
| Net Income | 3,855 | 15,441 | 11,586 |
| Rice | | | |
| Production | 24,010 | 29,880 | |
| Cost | 8,910 | 9,586 | |
| Net Income | 15,100 | 20,294 | 5,194 |
| Corn | | | |
| Production | 29,260 | 51,000 | |
| Cost | 11,160 | 10,543 | |
| Net Income | 18,100 | 40,457 | 22,357 |

3.3 Financial Analysis of Ordinary Farmers

Required certified seeds will be supplied by the project, so ordinary farmers will make profit compared to using commercial seeds. Productivities per hectare using commercial seeds and certified seeds are as shown in Table J.3.7. According to interview survey to farmers, productivities per hectare using certified seeds were supposed to be 1.5 tons for peanut, 3.5 tons for rice and 2.7 tons for corn. The increasing profit per hectare is expected to be 12,548 pesos for peanut, 3,609 pesos for rice and 3,163 pesos for corn, as shown in below.

| Profitability in Ordinary Farmers | | | Unit: pesos/ha |
|-----------------------------------|------------------|-----------------|------------------|
| | Commercial Seeds | Certified Seeds | Increased Profit |
| Peanut | | | |
| Production | 11,200 | 24,000 | |
| Cost | 8,350 | 8,602 | |
| Net Income | 2,850 | 15,398 | 12,548 |
| Rice | | | |
| Production | 13,000 | 17,500 | |
| Cost | 7,540 | 8,431 | |
| Net Income | 5,460 | 9,069 | 3,609 |
| Corn | | | |
| Production | 12,000 | 16,200 | |
| Cost | 4,123 | 5,160 | |
| Net Income | 7,877 | 11,040 | 3,163 |

4. ECONOMIC EVALUATION

4.1 Object and Method of Economic Evaluation

The object of economic evaluation is to analyze validity of the role of peanut, rice and corn seed production in model areas from the viewpoint of national economy.

In general, cost benefit ratio, net present value and internal rate of return (IRR) are used to analyze economic viability of the development project. Annual operation and maintenance cost of this project is expected to be a small amount compared to the initial investment cost, and the project should be compared among public investment projects. In this project, therefore, IRR was used as an indicator. The basic assumptions used are as follows :

1) Period for Evaluation

Period for economic evaluation is 20 years, considering the life period of facilities.

2) Economic Cost

a) Trade Goods

Economic cost of trade goods were converted from the financial cost. Direct transfer cost such as tax and subsidy were deducted, and conversion factors by the sector were applied. Conversion factors are estimated as follows, considering estimation by ADB and IBRD.

| | Conversion Factors |
|----------------|--------------------|
| Capital Goods | 0.85 |
| Utilities | 0.70 |
| Transportation | 0.70 |
| Construction | 0.80 |

b) Non-trade Goods

Economic cost of non-trade goods was converted from financial cost using standard conversion factor (0.80).

c) Labor Cost

Economic cost of unskilled labor was converted from financial cost using conversion factor for consumption (0.65).

4.2 Economic Benefit

In this project, production, post-harvest treatment, test and storing system of seeds should be improved, and production of certified seeds should increase. Therefore, final crop

production should increase in ordinary farmers' level.

Even in a case without the project, seed production will increase through efficient utilization of present facilities and strengthening of management systems in the public sector, because its share is only small. In seed growers, however, certified seed should be produced in large volumes in a huge area to meet the planned requirement in the future, but the productivity is expected to be the same as present level, 0.7 ton/ha for peanut, 2.0 ton/ha for rice, 1.2 ton/ha for corn in case without project. Therefore, effects of the project are expected to appear on the increase of certified seed production as shown below.

| | Effects Certified Seed Production Increase | | Unit: ton/year |
|--------|--|-----------------|----------------|
| | With Project | Without Project | Effects |
| Peanut | 260 | 175 | 85 |
| Rice | 6,409 | 3,562 | 2,847 |
| Corn | 1,620 | 632 | 988 |

For ordinary farmers, net income per hectare using certified seeds and other commercial seeds are estimated as the following in economic cost. In economic cost, farmgate price of rice and corn were estimated as shown in Table J.4.1 and J.4.2 using international price estimated by IBRD. Farmgate price of peanut was estimated as market price. In production cost, farmgate price of fertilizers are estimated as shown in Table J.4.3 - J.4.5.

| | Net Income of Ordinary Farmers | | Unit: pesos/ha |
|------------|--------------------------------|------------------|----------------|
| | Certified Seeds | Commercial Seeds | Effects |
| Peanut | | | |
| Production | 24,000 | 11,200 | |
| Cost | 7,098 | 6,731 | |
| Net Income | 16,902 | 4,469 | 12,433 |
| Rice | | | |
| Production | 13,755 | 10,218 | |
| Cost | 6,618 | 5,844 | |
| Net Income | 7,137 | 4,374 | 2,763 |
| Corn | | | |
| Production | 7,034 | 5,210 | |
| Cost | 4,045 | 3,032 | |
| Net Income | 2,989 | 2,178 | 811 |

Input volume of certified seeds per hectare is 100 kg for peanut, 105 kg for rice and 20 kg for corn, for ordinary farmers. The effects on production increase of certified seeds per hectare are as shown in the following.

| Benefits of Certified Seeds per ton | |
|-------------------------------------|--------------------|
| Peanut | 124 thousand pesos |
| Rice | 26 |
| Corn | 41 |

Therefore, annual benefits of the project are estimated as follows.

| Annual Benefits of the Project | |
|--------------------------------|-----------------------|
| Peanut | 10,540 thousand pesos |
| Rice | 74,022 |
| Corn | 40,508 |
| Total | 125,070 |

4.3 Economic Cost

Project cost consists of initial investment, reinvestment, operation and maintenance cost. These costs were used in economic price converted from financial price. A part of the cost concerning the facilities which will be used for general were allocated to object crops as the same as in financial evaluation.

(1) Initial Investment

Initial investment includes construction cost, design and supervising cost and contingencies. Initial investments of each crop are as shown in below.

| (Unit: '000 pesos) | | | |
|--------------------|----------|----------|---------|
| | 1st year | 2nd Year | Total |
| Peanut | 5,120 | 59,374 | 64,494 |
| Rice | 10,146 | 117,727 | 127,873 |
| Corn | 7,973 | 92,425 | 100,398 |
| Total | 23,239 | 269,526 | 292,765 |

(2) Reinvestment

Reinvestment will be done for machinery and equipment which have a 10-year life period, shorter than 20 years of evaluation period.

| (Unit: '000 pesos) | | | | |
|--------------------|--------|--------|--------|---------|
| | Peanut | Rice | Corn | Total |
| Peanut | 26,430 | 51,692 | 36,162 | 114,284 |

(3) Operation and Maintenance Cost

Operation and maintenance cost include production cost of seeds and operation and maintenance cost of facilities. The cost of each object crop is as follows.

(Unit: '000 pesos)

| | Peanut | Rice | Corn | Total |
|---------------------------|--------|--------|-------|--------|
| Production Cost of Seeds | 1,095 | 11,006 | 4,028 | 16,129 |
| Operation and Maintenance | | | | |
| Cost of Facilities | 3,190 | 6,957 | 3,830 | 13,977 |
| Total | 4,285 | 17,963 | 7,858 | 30,106 |

4.4 Economic Evaluation

After completion of the project construction, benefits will appear as 50% in the first year, 80% in the second, and 100% in and after the third.

Economic internal rate of return (EIRR) is 3.3% for peanut in Region II, 32.8% for rice in Region VI, 25.3% for corn in Region XI and 24.9% for total.

In the Philippines, interest rate of agricultural loan system of the government bank is 12%. The total project is viable because its EIRR exceeds 12%, which is the opportunity cost of capital. EIRRs of rice and corn project exceed the opportunity cost of capital, but EIRR of peanut only is below.

In this evaluation, only benefit from increased certified seed production was counted. If benefits from surplus of increased foundation seeds and registered seeds are counted, EIRRs will increase and be more viable. In order to count these benefits, appropriate technology of production and quality control of seeds should be introduced in distributed areas.

4.5 Sensitivity Analysis

Sensitivity analysis was carried out to analyze risks of uncertainty on project implementation, and relationship between EIRR and risks were analyzed. Risks analyzed were; decrease of benefits, increase of cost, and delay of benefit appearance.

(Unit: %)

| Crop | Base | Delay of Benefit Appearance | | Decrease of Benefit | | Increase of Cost | |
|--------|------|-----------------------------|---------|---------------------|------|------------------|------|
| | | 1 year | 2 years | 10% | 20% | 10% | 20% |
| Peanut | 3.3 | 1.8 | 0.6 | 0.8 | - | 1.1 | - |
| Rice | 32.8 | 24.3 | 19.3 | 28.6 | 24.3 | 29.0 | 25.8 |
| Corn | 25.3 | 19.8 | 16.1 | 22.1 | 18.8 | 22.4 | 19.9 |
| Total | 24.9 | 19.2 | 15.4 | 21.5 | 17.9 | 21.8 | 19.9 |

EIRR of the total project exceeds the opportunity cost of the capital in all cases. Also, rice and corn projects are viable in all cases. But EIRRs of peanut project are minus in case of 20% decrease of benefit and 20% increase of cost; in these cases even the national economy loses except opportunity cost of capital.

4.6 Secondary Benefit

Benefits of the project are not only directly countable as mentioned above. The model improvement plan should be extended to other crops and other Regions to increase productivity of seeds. Furthermore, another secondary benefits which are difficult to count will occur as mentioned below.

1) Utilization of Surplus Seeds

In this project, seeds will be provided not only to meet the requirement in model areas, but also acts as surplus to supply other areas. These surplus seeds will contribute to increase crop production in distributed areas.

2) Emergency Seed Supply from Buffer Stock

Buffer stock seeds will be supplied in case of natural calamities such as typhoon and draught. Effects of buffer stock will appear in areas attacked by calamities to maintain stable seed supply.

3) Development of Industries Related

To increase seed production contributes directly to the increase of crop production. Therefore, related industries of crop production, such as supplying of agricultural input and marketing of crops will be developed, and opportunity of employment will increase in these industries.

**Table J.1.1 GROSS REGIONAL DOMESTIC PRODUCT
FROM 1987 TO 1989**

Unit: '000,000 pesos

| | at Current Prices | | | at 1972 Constant Prices | | |
|-------------|-------------------|---------|---------|-------------------------|---------|---------|
| | 1987 | 1988 | 1989 | 1987 | 1988 | 1989 |
| TOTAL | 708,369 | 825,707 | 963,171 | 95,483 | 101,398 | 107,467 |
| NCR | 216,670 | 263,587 | 309,137 | 28,432 | 31,014 | 33,286 |
| CAR | 11,759 | 13,614 | 15,425 | 1,460 | 1,538 | 1,665 |
| Region I | 21,902 | 24,925 | 28,371 | 3,184 | 3,331 | 3,430 |
| Region II | 13,429 | 15,091 | 18,206 | 1,949 | 2,041 | 2,099 |
| Region III | 62,384 | 72,407 | 84,920 | 7,678 | 8,139 | 8,881 |
| Region IV | 101,235 | 112,177 | 130,183 | 13,207 | 13,752 | 14,331 |
| Region V | 22,585 | 26,349 | 30,042 | 3,148 | 3,350 | 3,452 |
| Region VI | 46,418 | 53,109 | 60,977 | 6,615 | 6,910 | 7,215 |
| Region VII | 49,619 | 58,880 | 70,456 | 7,002 | 7,531 | 8,127 |
| Region VIII | 19,457 | 22,159 | 25,646 | 2,977 | 3,086 | 3,185 |
| Region IX | 25,428 | 27,738 | 32,385 | 3,630 | 3,749 | 3,939 |
| Region X | 38,294 | 44,962 | 52,053 | 5,279 | 5,643 | 5,971 |
| Region XI | 52,950 | 61,529 | 70,080 | 7,123 | 7,378 | 7,725 |
| Region XII | 26,239 | 29,180 | 35,290 | 3,799 | 3,936 | 4,161 |

Source: Gross Regional Domestic Product Summary 1987-1989, National Statistical Coordination Board

**Table J.1.2 GROSS VALUE ADDED IN AGRICULTURE
FROM 1987 TO 1989**

Unit: '000,000 pesos

| | at Current Prices | | | at 1972 Constant Prices | | |
|-------------|-------------------|---------|---------|-------------------------|--------|--------|
| | 1987 | 1988 | 1989 | 1987 | 1988 | 1989 |
| TOTAL | 170,770 | 189,988 | 225,872 | 26,834 | 27,771 | 28,887 |
| NCR | 0 | 0 | 0 | 0 | 0 | 0 |
| CAR | 3,119 | 3,621 | 3,928 | 476 | 502 | 508 |
| Region I | 9,356 | 10,797 | 12,189 | 1,509 | 1,609 | 1,612 |
| Region II | 7,163 | 8,023 | 10,179 | 1,139 | 1,219 | 1,244 |
| Region III | 13,174 | 14,982 | 19,746 | 2,228 | 2,231 | 2,521 |
| Region IV | 25,252 | 28,367 | 33,736 | 4,225 | 4,502 | 4,580 |
| Region V | 11,613 | 13,110 | 14,789 | 1,745 | 1,846 | 1,860 |
| Region VI | 16,617 | 18,283 | 20,834 | 2,767 | 2,843 | 2,914 |
| Region VII | 9,407 | 10,149 | 13,632 | 1,548 | 1,591 | 1,836 |
| Region VIII | 8,586 | 9,286 | 10,566 | 1,352 | 1,375 | 1,375 |
| Region IX | 14,879 | 16,030 | 19,139 | 2,104 | 2,174 | 2,291 |
| Region X | 15,217 | 17,229 | 20,101 | 2,245 | 2,301 | 2,449 |
| Region XI | 23,005 | 25,989 | 29,888 | 3,381 | 3,442 | 3,524 |
| Region XII | 13,382 | 14,122 | 17,145 | 2,115 | 2,136 | 2,173 |

Source: Gross Regional Domestic Product Summary 1987-1989, National Statistical Coordination Board

**Table J.1.3 GDP BY INDUSTRIAL ORIGIN, PHILIPPINES
FROM 1987 TO 1989**

Unit: '000,000 pesos

| | at Current Prices | | | at 1972 Constant Prices | | |
|-------------------------|-------------------|---------|---------|-------------------------|---------|---------|
| | 1987 | 1988 | 1989 | 1987 | 1988 | 1989 |
| GDP | 708,369 | 825,707 | 963,171 | 95,483 | 101,398 | 107,467 |
| AGRICULTURE | 170,770 | 189,988 | 225,872 | 26,834 | 27,771 | 28,887 |
| Agricultural Crops | 95,516 | 106,860 | 129,282 | 16,374 | 16,546 | 16,941 |
| Livestock & Poultry | 28,028 | 32,780 | 39,705 | 5,174 | 5,702 | 6,268 |
| Fishery | 36,319 | 37,227 | 44,546 | 4,638 | 4,834 | 5,046 |
| Forestry | 10,907 | 13,121 | 12,339 | 648 | 689 | 632 |
| INDUSTRY | 232,586 | 277,176 | 320,437 | 30,609 | 33,205 | 35,563 |
| Mining & Quarrying | 13,601 | 15,996 | 16,462 | 1,547 | 1,615 | 1,571 |
| Manufacturing | 173,539 | 207,447 | 240,377 | 23,187 | 25,251 | 26,991 |
| Construction | 28,113 | 33,645 | 41,965 | 3,967 | 4,344 | 4,865 |
| Electricity, Gas, Water | 17,333 | 20,088 | 21,633 | 1,908 | 1,995 | 2,136 |
| SERVICE SECTOR | 305,013 | 358,543 | 416,862 | 38,040 | 40,422 | 43,017 |
| Transportation | 42,027 | 44,973 | 48,276 | 5,251 | 5,487 | 5,764 |
| Trade | 137,375 | 162,668 | 187,550 | 15,153 | 15,998 | 17,006 |
| Finance & Housing | 48,467 | 55,688 | 67,665 | 5,832 | 6,250 | 6,862 |
| Private Services | 38,534 | 44,245 | 51,850 | 6,107 | 6,445 | 6,775 |
| Government Services | 38,610 | 50,969 | 61,521 | 5,697 | 6,242 | 6,610 |

Source: Gross Regional Domestic Product Summary 1987-1989, National Statistical Coordination Board

**Table J.1.4 GDP BY INDUSTRIAL ORIGIN, REGION II
FROM 1987 TO 1989**

Unit: '000,000 pesos

| | at Current Prices | | | at 1972 Constant Prices | | |
|-------------------------|-------------------|--------|--------|-------------------------|-------|-------|
| | 1987 | 1988 | 1989 | 1987 | 1988 | 1989 |
| GDP | 13,429 | 15,091 | 18,206 | 1,949 | 2,041 | 2,099 |
| AGRICULTURE | 7,163 | 8,023 | 10,179 | 1,139 | 1,219 | 1,244 |
| Agricultural Crops | 4,285 | 4,775 | 6,646 | 795 | 859 | 868 |
| Livestock & Poultry | 1,484 | 1,546 | 1,917 | 261 | 268 | 291 |
| Fishery | 49 | 58 | 80 | 6 | 6 | 6 |
| Forestry | 1,345 | 1,644 | 1,536 | 78 | 86 | 79 |
| INDUSTRY | 1,336 | 1,512 | 1,747 | 185 | 192 | 206 |
| Mining & Quarrying | 39 | 35 | 39 | 5 | 4 | 5 |
| Manufacturing | 511 | 574 | 660 | 75 | 78 | 84 |
| Construction | 613 | 694 | 814 | 86 | 90 | 95 |
| Electricity, Gas, Water | 173 | 209 | 234 | 19 | 19 | 22 |
| SERVICE SECTOR | 4,930 | 5,556 | 6,280 | 624 | 630 | 650 |
| Transportation | 409 | 424 | 447 | 45 | 47 | 49 |
| Trade | 2,006 | 2,210 | 2,471 | 231 | 229 | 237 |
| Finance & Housing | 1,235 | 1,373 | 1,537 | 147 | 151 | 154 |
| Private Services | 209 | 239 | 293 | 43 | 43 | 46 |
| Government Services | 1,071 | 1,310 | 1,532 | 158 | 160 | 165 |

Source: Gross Regional Domestic Product Summary 1987-1989, National Statistical Coordination Board

**Table J.1.5 GDP BY INDUSTRIAL ORIGIN, REGION VI
FROM 1987 TO 1989**

Unit: '000,000 pesos

| | at Current Prices | | | at 1972 Constant Prices | | |
|-------------------------|-------------------|--------|--------|-------------------------|-------|-------|
| | 1987 | 1988 | 1989 | 1987 | 1988 | 1989 |
| GDP | 46,418 | 53,109 | 60,977 | 6,615 | 6,910 | 7,215 |
| AGRICULTURE | 16,617 | 18,283 | 20,834 | 2,766 | 2,843 | 2,914 |
| Agricultural Crops | 8,354 | 9,558 | 10,100 | 1,524 | 1,536 | 1,456 |
| Livestock & Poultry | 2,488 | 2,968 | 3,865 | 525 | 563 | 684 |
| Fishery | 5,774 | 5,756 | 6,868 | 718 | 743 | 774 |
| Forestry | 1 | 1 | 1 | 0 | 0 | 0 |
| INDUSTRY | 8,539 | 9,486 | 10,725 | 1,254 | 1,248 | 1,303 |
| Mining & Quarrying | 902 | 929 | 980 | 200 | 186 | 159 |
| Manufacturing | 5,914 | 6,581 | 7,244 | 850 | 858 | 903 |
| Construction | 1,010 | 1,131 | 1,509 | 142 | 146 | 177 |
| Electricity, Gas, Water | 713 | 845 | 992 | 61 | 59 | 64 |
| SERVICE SECTOR | 21,262 | 25,340 | 29,418 | 2,595 | 2,819 | 2,999 |
| Transportation | 1,695 | 1,833 | 1,961 | 193 | 206 | 217 |
| Trade | 12,077 | 14,806 | 17,217 | 1,366 | 1,523 | 1,641 |
| Finance & Housing | 2,977 | 3,300 | 3,810 | 339 | 355 | 373 |
| Private Services | 2,601 | 2,974 | 3,553 | 414 | 438 | 459 |
| Government Services | 1,912 | 2,427 | 2,877 | 282 | 297 | 309 |

Source: Gross Regional Domestic Product Summary 1987-1989, National Statistical Coordination Board

**Table J.1.6 GDP BY INDUSTRIAL ORIGIN, REGION XI
FROM 1987 TO 1989**

Unit: '000,000 pesos

| | at Current Prices | | | at 1972 Constant Prices | | |
|-------------------------|-------------------|--------|--------|-------------------------|-------|-------|
| | 1987 | 1988 | 1989 | 1987 | 1988 | 1989 |
| GDP | 52,950 | 61,530 | 70,080 | 7,123 | 7,378 | 7,725 |
| AGRICULTURE | 23,005 | 25,989 | 29,888 | 3,381 | 3,442 | 3,524 |
| Agricultural Crops | 17,140 | 19,213 | 22,932 | 2,769 | 2,798 | 2,863 |
| Livestock & Poultry | 1,498 | 1,698 | 1,964 | 308 | 323 | 350 |
| Fishery | 703 | 769 | 895 | 89 | 96 | 99 |
| Forestry | 3,664 | 4,309 | 4,097 | 216 | 225 | 211 |
| INDUSTRY | 9,904 | 12,374 | 13,922 | 1,267 | 1,387 | 1,516 |
| Mining & Quarrying | 2,606 | 2,790 | 2,706 | 120 | 116 | 114 |
| Manufacturing | 5,793 | 7,790 | 9,111 | 940 | 1,050 | 1,163 |
| Construction | 1,144 | 1,307 | 1,576 | 161 | 169 | 185 |
| Electricity, Gas, Water | 361 | 487 | 529 | 46 | 51 | 53 |
| SERVICE SECTOR | 20,041 | 23,167 | 26,270 | 2,474 | 2,550 | 2,685 |
| Transportation | 2,411 | 2,503 | 2,623 | 281 | 284 | 289 |
| Trade | 12,749 | 15,034 | 16,982 | 1,502 | 1,555 | 1,642 |
| Finance & Housing | 2,263 | 2,496 | 2,797 | 256 | 260 | 266 |
| Private Services | 1,453 | 1,662 | 1,935 | 263 | 270 | 280 |
| Government Services | 1,165 | 1,472 | 1,933 | 172 | 180 | 208 |

Source: Gross Regional Domestic Product Summary 1987-1989, National Statistical Coordination Board

**Table J.1.7 HOUSEHOLD POPULATION 15 YEARS OLD AND OVER
BY EMPLOYMENT STATUS (1988)**

Unit: '000

| | 15 yrs old & over | Labor force | Employed | | | Un- employed | Unemploy- ed Rate (%) |
|-------------|----------------------|-------------|----------|-------------|-----------|-----------------|-----------------------------|
| | | | Total | Agriculture | Non-agri. | | |
| TOTAL | 35,857 | 22,939 | 21,967 | 10,163 | 11,804 | 972 | 4.24 |
| NCR | 5,004 | 2,795 | 2,508 | 47 | 2,461 | 287 | 10.27 |
| CAR | 677 | 477 | 466 | 269 | 197 | 11 | 2.31 |
| Region I | 2,096 | 1,327 | 1,284 | 707 | 577 | 43 | 3.24 |
| Region II | 1,409 | 984 | 985 | 617 | 348 | 19 | 1.93 |
| Region III | 3,629 | 2,175 | 2,066 | 763 | 1,303 | 109 | 5.01 |
| Region IV | 4,689 | 2,959 | 2,832 | 1,082 | 1,750 | 127 | 4.29 |
| Region V | 2,417 | 1,660 | 1,612 | 890 | 722 | 48 | 2.89 |
| Region VI | 3,234 | 2,060 | 2,009 | 1,147 | 862 | 51 | 2.48 |
| Region VII | 2,736 | 1,818 | 1,771 | 875 | 896 | 47 | 2.59 |
| Region VIII | 1,920 | 1,428 | 1,375 | 852 | 523 | 53 | 3.71 |
| Region IX | 1,812 | 1,090 | 1,059 | 650 | 409 | 31 | 2.84 |
| Region X | 2,077 | 1,400 | 1,347 | 709 | 638 | 53 | 3.79 |
| Region XI | 2,500 | 1,697 | 1,632 | 929 | 703 | 65 | 3.83 |
| Region XII | 1,657 | 1,069 | 1,041 | 626 | 415 | 28 | 2.62 |

Source: Philippine Yearbook 1989, National Statistics Office

Table J.2.1 BUDGET OF DEPARTMENT OF AGRICULTURE

| | unit: '000 pesos | | | |
|---|------------------|-----------|-----------|-----------|
| | 1987 | 1988 | 1989 | 1990 |
| General Administration & Support Services | 74,866 | 81,897 | 146,517 | 148,342 |
| Administration of Personnel Benefits | | | 110,914 | 110,918 |
| Salary Standardization | | | 219,397 | 302,118 |
| Agricultural Statistics | 54,868 | 59,880 | 68,509 | 64,744 |
| Training of Extension Workers | 35,886 | 68,126 | 68,480 | 64,257 |
| Agricultural Research | | 6,584 | 5,292 | 7,665 |
| Development of the Livestock Industries | 72,002 | 79,728 | 87,115 | 82,947 |
| Development of the Plant Industry | 67,458 | 70,730 | 62,693 | 55,443 |
| Development of Cooperatives | 25,175 | 22,282 | 21,852 | 20,116 |
| Water Management & Soil Conservation | 37,954 | 47,944 | 76,557 | 63,690 |
| Development of Fisheries | 66,655 | 74,222 | 62,429 | 58,039 |
| Coordination of Agricultural Credit Program | 3789 | | | |
| Regional Operations | 1,027,160 | 1,141,297 | 1,356,591 | 1,341,749 |
| TOTAL | 1,465,813 | 1,652,690 | 2,286,346 | 2,320,028 |

Table J.2.2 BUDGET OF BUREAU OF PLANT INDUSTRY

unit: '000 pesos

| | 1987 | 1988 | 1989 | 1990 |
|--|---------------|---------------|---------------|---------------|
| General Administrative Servises | 9,323 | 10,168 | 7,492 | 6,442 |
| Staff Development | 135 | 149 | 155 | 250 |
| White Potato Research | 2,511 | 2,373 | | |
| Agricultural Crops Research | 7,043 | 7,362 | 4,195 | 3,879 |
| Research on Farm Tools & Implements | 1,304 | 1,390 | 1,114 | 1,298 |
| Crop Utilization | 1,922 | 2,056 | 1,775 | 1,789 |
| Production of Seeds & Plant Materials | 24,976 | 23,260 | 17,645 | 11,411 |
| Seed Quality Control | 1,553 | 1,639 | 1,323 | 1,414 |
| Management of Plant Pests & Diseases | 5690 | 6013 | 5889 | 4757 |
| Enforcement of Plant Quarantine Laws | 3,062 | 3,314 | 2,158 | 1,988 |
| Pesticide and Residue Analysis | 2,066 | 2,100 | 2,044 | 1,587 |
| Multy-storey Intercropping | 3,645 | 4,010 | | |
| Verification & Packaging of Technology | 1,433 | 1,530 | | |
| Support of Plant Qualantine Services | 2,795 | 4,000 | 4,167 | 4,137 |
| Operation & Maintenance of NCC | | | 14,736 | 15,898 |
| Acquisition of Equipment | | 1,366 | | 593 |
| TOTAL | 67,458 | 70,730 | 62,693 | 55,443 |

Table J.3.1 CONSTRUCTION COST OF THE PROJECT

unit: '000 pesos

| | Peanut | | | Rice | | |
|------------------------------|--------|---------|---------|--------|---------|---------|
| | Local | Foreign | Total | Local | Foreign | Total |
| Irrigation Facilities | 28 | 4,007 | 4,035 | 0 | 0 | 0 |
| Pre & Post Harvest Machinery | 2,835 | 16,067 | 18,902 | 5,923 | 33,562 | 39,485 |
| Quality Control Equipment | 938 | 5,313 | 6,251 | 748 | 4,239 | 4,987 |
| Buildings | 12,640 | 26,860 | 39,500 | 19,850 | 43,650 | 63,500 |
| Subtotal | 16,441 | 52,247 | 68,688 | 26,521 | 81,451 | 107,972 |
| Design & Supervising | 1,644 | 5,225 | 6,869 | 2,652 | 8,145 | 10,797 |
| Physical Contingency | 1,644 | 5,225 | 6,869 | 2,652 | 8,145 | 10,797 |
| Price Contingency | 1,644 | 2,612 | 4,256 | 2,652 | 4,073 | 6,725 |
| Total | 21,373 | 65,309 | 86,682 | 34,477 | 101,814 | 136,291 |
| | Corn | | | Total | | |
| | Local | Foreign | Total | Local | Foreign | Total |
| Irrigation Facilities | 2,879 | 18,865 | 21,744 | 2,907 | 22,872 | 25,779 |
| Pre & Post Harvest Machinery | 3,429 | 19,432 | 22,861 | 12,187 | 69,061 | 81,248 |
| Quality Control Equipment | 794 | 4,497 | 5,291 | 2,480 | 14,049 | 16,529 |
| Buildings | 14,430 | 30,970 | 45,400 | 46,920 | 101,480 | 148,400 |
| Subtotal | 21,532 | 73,764 | 95,296 | 64,494 | 207,462 | 271,956 |
| Design & Supervising | 2,153 | 7,376 | 9,529 | 6,449 | 20,746 | 27,195 |
| Physical Contingency | 2,153 | 7,376 | 9,529 | 6,449 | 20,746 | 27,195 |
| Price Contingency | 2,153 | 3,688 | 5,841 | 6,449 | 10,373 | 16,822 |
| Total | 27,991 | 92,204 | 120,195 | 83,841 | 259,327 | 343,168 |

Table J.3.2 CONSTRUCTION COST FOR MODEL IMPROVEMENT PLAN

unit: '000 pesos

| | Peanut | | | Rice | | |
|------------------------------|--------|---------|---------|--------|---------|---------|
| | Local | Foreign | Total | Local | Foreign | Total |
| Irrigation Facilities | 28 | 4,007 | 4,035 | 0 | 0 | 0 |
| Pre & Post Harvest Machinery | 2,453 | 13,901 | 16,354 | 5,792 | 32,822 | 38,614 |
| Quality Control Equipment | 113 | 638 | 751 | 726 | 4,122 | 4,838 |
| Buildings | 9,859 | 22,689 | 32,548 | 19,754 | 43,506 | 63,260 |
| Subtotal | 12,453 | 41,235 | 53,688 | 26,272 | 80,440 | 106,712 |
| Design & Supervising | 1,245 | 4,124 | 5,369 | 2,627 | 8,044 | 10,671 |
| Physical Contingency | 1,245 | 4,124 | 5,369 | 2,627 | 8,044 | 10,671 |
| Price Contingency | 1,245 | 2,062 | 3,307 | 2,627 | 4,022 | 6,649 |
| Total | 16,188 | 51,545 | 67,733 | 34,153 | 100,550 | 134,703 |
| | Corn | | | Total | | |
| | Local | Foreign | Total | Local | Foreign | Total |
| Irrigation Facilities | 2,879 | 18,865 | 21,744 | 2,907 | 22,872 | 25,779 |
| Pre & Post Harvest Machinery | 3,168 | 17,954 | 21,122 | 11,413 | 64,677 | 76,090 |
| Quality Control Equipment | 191 | 1,079 | 1,270 | 1,030 | 5,829 | 6,859 |
| Buildings | 11,968 | 27,276 | 39,244 | 41,581 | 93,471 | 135,052 |
| Subtotal | 18,206 | 65,174 | 83,380 | 56,931 | 186,849 | 243,780 |
| Design & Supervising | 1,821 | 6,517 | 8,338 | 5,693 | 18,685 | 24,378 |
| Physical Contingency | 1,821 | 6,517 | 8,338 | 5,693 | 18,685 | 24,378 |
| Price Contingency | 1,821 | 3,259 | 5,080 | 5,693 | 9,343 | 15,036 |
| Total | 23,669 | 81,467 | 105,136 | 74,010 | 233,562 | 307,572 |

Table J.3.3 SEED PRODUCTION COST BY CROP

unit: peso/ha

| | (Unit) | Peanut | | | Rice | | | Corn | | |
|-----------------------|--------|--------|------------|--------------|------|------------|--------------|------|------------|--------------|
| | | Q'ty | Unit Price | Amount | Q'ty | Unit Price | Amount | Q'ty | Unit Price | Amount |
| Fertilizers | | | | | | | | | | |
| Urea | (bag) | | | | 3 | 200 | 600 | 1 | 215 | 215 |
| 14-14-14 | (bag) | 2 | 237 | 474 | 1.8 | 237 | 427 | 6 | 235 | 1,410 |
| 16-20-0 | (bag) | | | | 1.5 | 223 | 335 | 2 | 238 | 476 |
| Agro-chemicals | | | | | | | | | | |
| Insecticide | (l) | 1 | 210 | 210 | 1.5 | 220 | 330 | 2 | 305 | 610 |
| Herbicide | (l) | | | | 1.5 | 240 | 360 | | | |
| Fungicide | (kg) | 1 | 220 | 220 | | | | | | |
| Labor Input | | | | | | | | | | |
| Man-day | | 85 | 35 | 2,975 | 105 | 35 | 3,675 | 124 | 40 | 4,960 |
| Animal-day | | 14 | 35 | 490 | 10 | 35 | 350 | 27 | 35 | 945 |
| Machine-hour | | 4 | 150 | 600 | 11 | 175 | 1,925 | 4 | 250 | 1,000 |
| Total | | | | 4,969 | | | 8,002 | | | 9,616 |

Table J.3.4 REQUIRED NUMBER OF PERSONNEL

| | Region II | Region VI | Region XI | No. of Months | Monthly Salary (peso) |
|------------------------------|-----------|-----------|-----------|---------------|-----------------------|
| Permanent Staff | 43 | 43 | 35 | 12 | |
| Irrigation | 0 | 0 | 0 | 12 | 2,500 |
| Pre & Post Harvest Machinery | 2 | 2 | 2 | 12 | 2,500 |
| Quality Control | 40 | 40 | 32 | 12 | 2,750 |
| Management | 1 | 1 | 1 | 12 | 5,000 |
| Temporary Staff | 11 | 20 | 14 | | |
| Irrigation | 1 | 0 | 1 | 4 | 2,500 |
| Pre & Post Harvest Machinery | 6 | 15 | 10 | 2 | 2,200 |
| Quality Control | 4 | 5 | 3 | 6 | 2,500 |

Table J.3.5 ANNUAL OPERATION AND MAINTENANCE COST

unit: '000 pesos

| | Peanut | Rice | Corn | Total |
|---|--------|-------|-------|--------|
| for Total | | | | |
| Operation cost of irrigation facilities | 51 | 0 | 19 | 70 |
| Operation cost of pre & post harvest Machinery | 1,200 | 1,070 | 1,177 | 3,477 |
| Operation cost of quality control equipment | 1,563 | 1,247 | 1,323 | 4,133 |
| Electric charge | 547 | 495 | 530 | 1,572 |
| Maintenance cost for irrigation facilities | 20 | 0 | 109 | 129 |
| Maintenance cost for pre & post harvest machinery | 1,323 | 2,764 | 1,600 | 5,687 |
| Maintenance cost for quality control equipment | 438 | 349 | 370 | 1,157 |
| Maintenance cost for buildings | 198 | 318 | 227 | 743 |
| Personnel expenses | 1,536 | 1,581 | 1,275 | 4,392 |
| Total | 6,876 | 7,824 | 6,630 | 21,330 |
| for Model Improvement Plan | | | | |
| Operation cost of irrigation facilities | 51 | 0 | 19 | 70 |
| Operation cost of pre & post harvest Machinery | 993 | 1,014 | 1,035 | 3,042 |
| Operation cost of quality control equipment | 188 | 1,210 | 318 | 1,716 |
| Electric charge | 547 | 495 | 530 | 1,572 |
| Maintenance cost for irrigation facilities | 20 | 0 | 109 | 129 |
| Maintenance cost for pre & post harvest machinery | 1,145 | 2,703 | 1,479 | 5,327 |
| Maintenance cost for quality control equipment | 53 | 339 | 89 | 481 |
| Maintenance cost for buildings | 163 | 316 | 196 | 675 |
| Personnel expenses | 322 | 1,539 | 438 | 2,299 |
| Total | 3,482 | 7,616 | 4,213 | 15,311 |

Table J.3.6 INCOME OF THE PROJECT

unit: '000 peso

| | Quantity | Unit Price | Income |
|--------------------------|----------|------------|--------------|
| Peanut | | | 438 |
| Sales of FS | 0 | 23 | 0 |
| Sales of RS | 13.2 | 23 | 304 |
| Commission of RS Selling | 14.0 | 3 | 42 |
| Sales of CS | 0 | 23 | 0 |
| Commission of CS Selling | 25 | 3 | 75 |
| Charge of Machinery | 25 | 0.15 | 4 |
| Fee for Field Inspection | 391 | 0.025 | 10 |
| Fee for Seed Test | 102 | 0.03 | 3 |
| Rice | | | 1,147 |
| Sales of FS | 1.59 | 9.8 | 16 |
| Sales of RS | 80.1 | 9.0 | 721 |
| Commission of RS Selling | 19.5 | 0.3 | 6 |
| Sales of CS | 0 | 8.3 | 0 |
| Commission of CS Selling | 641 | 0.3 | 192 |
| Charge of Machinery | 641 | 0.13 | 83 |
| Fee for Field Inspection | 3,214 | 0.025 | 80 |
| Fee for Seed Test | 1,645 | 0.03 | 49 |
| Corn | | | 777 |
| Sales of FS | 0.114 | 22 | 3 |
| Sales of RS | 10.2 | 20 | 204 |
| Commission of RS Selling | 0 | 2 | 0 |
| Sales of CS | 3.7 | 17 | 63 |
| Commission of CS Selling | 158 | 2 | 316 |
| Charge of Machinery | 158 | 1.0 | 158 |
| Fee for Field Inspection | 526 | 0.05 | 26 |
| Fee for Seed Test | 234 | 0.03 | 7 |

Table J.3.7 PRODUCTIVITY OF OBJECT CROPS IN ORDINARY FARMERS

| | | unit: peso/ha | | | | | |
|--------------------|--------|------------------|------------|--------|-----------------|------------|--------|
| | | Commercial Seeds | | | Certified Seeds | | |
| | (Unit) | Q'ty | Unit Price | Amount | Q'ty | Unit Price | Amount |
| Peanut | | | | | | | |
| 1. Yield | (ton) | 0.7 | 16,000 | 11,200 | 1.5 | 16,000 | 24,000 |
| 2. Production Cost | | | | | | | |
| Seeds | (kg) | 167 | 11 | 1,837 | 110 | 23 | 2,530 |
| Fertilizer | | | | | | | |
| 14-14-14 | (bag) | | | | 1 | 237 | 237 |
| Agro-chemicals | | | | | | | |
| Insecticide | (l) | 0.12 | 210 | 25 | 0.5 | 210 | 105 |
| Fungicide | (kg) | | | | 0.5 | 220 | 110 |
| Labor Input | | | | | | | |
| Man-day | | 134 | 35 | 4,690 | 120 | 35 | 4,200 |
| Animal-day | | 48 | 35 | 1,680 | 20 | 35 | 700 |
| Machine-hour | | | | | 4 | 120 | 480 |
| Other Cost | | | | 112 | | | 240 |
| 3. Net Income | | | | 2,856 | | | 15,398 |
| Rice | | | | | | | |
| 1. Yield | (ton) | 2.6 | 5,000 | 13,000 | 3.5 | 5,000 | 17,500 |
| 2. Production Cost | | | | | | | |
| Seeds | (kg) | 135 | 5 | 675 | 105 | 8.3 | 872 |
| Fertilizer | | | | | | | |
| Urea | (bag) | 3 | 200 | 600 | 3 | 200 | 600 |
| 14-14-14 | (bag) | 1 | 237 | 237 | 3 | 237 | 711 |
| Agro-chemicals | | | | | | | |
| Insecticide | (l) | 3 | 216 | 648 | 3 | 216 | 648 |
| Herbicide | (kg) | 3 | | 675 | 3 | 225 | 675 |
| Labor Input | | | | | | | |
| Man-day | | 95 | 35 | 3,325 | 100 | 35 | 3,500 |
| Animal-day | | 10 | 35 | 350 | 10 | 35 | 350 |
| Machine-hour | | 8 | 50 | 400 | 8 | 50 | 400 |
| Irrigation Fee | (kg) | 100 | 5 | 500 | 10 | 5 | 500 |
| Other Cost | | | | 130 | | | 175 |
| 3. Net Income | | | | 5,460 | | | 9,069 |
| Corn | | | | | | | |
| 1. Yield | (ton) | 2 | 6,000 | 12,000 | 2.7 | 6,000 | 16,200 |
| 2. Production Cost | | | | | | | |
| Seeds | (kg) | 20 | 6 | 120 | 20 | 17 | 340 |
| Fertilizer | | | | | | | |
| Urea | (bag) | 1 | 215 | 215 | 1 | 215 | 215 |
| 14-14-14 | (bag) | 1 | 238 | 238 | 1 | 238 | 238 |
| Agro-chemicals | | | | | | | |
| Insecticide | (l) | | | | 1 | 305 | 305 |
| Labor Input | | | | | | | |
| Man-day | | 70 | 40 | 2,800 | 80 | 40 | 3,200 |
| Animal-day | | 18 | 35 | 630 | 20 | 35 | 700 |
| Other Cost | | | | 120 | | | 162 |
| 3. Net Income | | | | 7,877 | | | 11,040 |

Table J.4.1 PRICE STRUCTURE OF RICE , 1990
Region VI

| | Financial | Conversion Factor | Economic | |
|--|-----------|----------------------|----------|----------|
| | P/ton | | P/ton | US\$/ton |
| Export price, Thai, white, milled, 5% broken, f.o.b. Bangkok | | | | 285 |
| Quality discount of 20% | | | | ▲57 |
| Fleight and insurance to Phillipine port | | | | 15 |
| Import price, c,i,f. Phillipine port | 5830 | | 5830 | 243 |
| Port handling charges | 140 | 0.80 | 110 | |
| Average cost of transport to selling center | 360 | 0.70 | 250 | |
| Average cost of transportation from mill to selling center | ▲160 | 0.70 | ▲110 | |
| Rice price ex-mill | 6170 | | 6080 | |
| Paddy equivalent price (65% milling recovery) | 4010 | | 3950 | |
| Average cost of transportation from farm to mill | ▲45 | 0.80 | ▲30 | |
| Milling cost | ▲485 | 0.80 | ▲390 | |
| Value of by-product | 400 | | 400 | |
| Farmgate paddy price | 3880 | | 3930 | |

Note 1) All values expressed in terms of 1990 price. US\$1.00 = P24.00

2) Export price is estimated by Word Bank (Commodity Price Forecasts, december 1989)

3) The Phillipine port used is Cebu.

4) Selling center is Iloilo.

Table J.4.2 PRICE STRUCTURE OF CORN , 1990
Region XI

| | Financial | Conversion Factor | Economic | |
|--|-----------|----------------------|----------|----------|
| | P/ton | | P/ton | US\$/ton |
| Export price, US, No. 2, yellow, f.o.b. Gulf | | | | 100 |
| Fleight and insurance to Phillipine port | | | | 25 |
| Import price, c,i,f. Phillipine port | 3000 | | 3000 | 125 |
| Port handling charges | 140 | 0.80 | 110 | |
| Average cost of transport to selling center | 30 | 0.70 | 20 | |
| Average cost of transportation from mill to selling center | ▲160 | 0.70 | ▲110 | |
| Milling and packaging cost | ▲480 | 0.80 | ▲385 | |
| Handling and transportation cost farm to mill | ▲45 | 0.70 | ▲30 | |
| Farmgate price | 2485 | | 2605 | |

Note 1) All values expressed in terms of 1990 price. US\$1.00 = P24.00

2) Export price is estimated by Word Bank (Commodity Price Forecasts, december 1989)

3) The Phillipine port used is Davao.

4) Selling center is Davao.

Table J.4.3 PRICE STRUCTURE OF UREA, 1990

| | Financial | Conversion | Economic | |
|---|-----------|------------|----------|----------|
| | P/ton | Factor | P/ton | US\$/ton |
| Export price, f.o.b. Indonesia | | | | 125 |
| Fleight and insurance to Phillipine port | | | | 24 |
| Import price, c,i,f. Phillipine port | 3575 | | 3575 | 149 |
| Import tax | 135 | | | |
| Port handling storage and processing charges | 305 | 0.80 | 245 | |
| Impoter's cost | 655 | 0.80 | 525 | |
| Average cost of transport to, and handling at distribution center | 130 | 0.70 | 90 | |
| Average cost of transportation from distribution center to farm | 285 | 0.70 | 200 | |
| Urea farmgate price | 5085 | | 4635 | |
| Nitrogen farmgate price | 11.0 | | 10.1 | |

Note 1) All values espressed in terms of 1990 price. US\$1.00 = P24.00

2) Export price is estimated by Word Bank (Commodity Price Forecasts, december 1989)

Table J.4.4 PRICE STRUCTURE OF TSP, 1990

| | Financial | Conversion | Economic | |
|---|-----------|------------|----------|----------|
| | P/ton | Factor | P/ton | US\$/ton |
| Export price, f.o.b. U.S. Gulf | | | | 140 |
| Fleight and insurance to Phillipine port | | | | 66 |
| Import price, c,i,f. Phillipine port | 4945 | | 4945 | 206 |
| Import tax | 150 | | | |
| Port handling storage and processing charges | 345 | 0.80 | 275 | |
| Impoter's cost | 735 | 0.80 | 590 | |
| Average cost of transport to, and handling at distribution center | 130 | 0.70 | 90 | |
| Average cost of transportation from distribution center to farm | 285 | 0.70 | 200 | |
| TSP farmgate price | 6590 | | 6100 | |
| Phosphorus farmgate price | 14.3 | | 13.2 | |

Note 1) All values espressed in terms of 1990 price. US\$1.00 = P24.00

2) Export price is estimated by Word Bank (Commodity Price Forecasts, december 1989)

Table J.4.5 PRICE STRUCTURE, MURIATE OF POTASH, 1990

| | Financial | Conversion | Economic | |
|---|-----------|------------|----------|----------|
| | P/ton | Factor | P/ton | US\$/ton |
| Export price, f.o.b. Vancouver | | | | 100 |
| Fleight and insurance to Phillipine port | | | | 25 |
| Import price, c,i,f. Phillipine port | 3000 | | 3000 | 125 |
| Import tax | 80 | | | |
| Port handling storage and processing charges | 180 | 0.80 | 145 | |
| Impoter's cost | 385 | 0.80 | 310 | |
| Average cost of transport to, and handling at distribution center | 130 | 0.70 | 90 | |
| Average cost of transportation from distribution center to farm | 285 | 0.70 | 200 | |
| Muriate of Potash farmgate price | 4060 | | 3745 | |
| Potassium farmgate price | 6.8 | | 6.3 | |

Note 1) All values espressed in terms of 1990 price. US\$1.00 = P24.00

2) Export price is estimated by Word Bank (Commodity Price Forecasts, december 1989)

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