

of crops (1.0 ton/ha of soybean and 417 kg/ha of mung bean). Chili and shallot are most profitable crops in dry season.

Table C.2.3 Net Profit Of Paddy, Palawija And Vegetable In 1994

Crop	Gross income (Rp./ha)	Production Cost (Rp./ha)	Net Profit (Rp.)		R/c
			Per Person	Per Month	
Paddy	1,1614,630	1,010,156	604,474	167,909	1.60
Corn	1,097,920	747,258	350,662	116,887	1.46
Soy Bean	497,200	692,567	254,633	77,162	1.37
Mung Bean	500,400	313,724	186,676	61,407	1.59
Peanut	1,613,325	959,525	653,800	152,047	1.68
Cassava	1,093,466	569,465	524,001	80,616	1.92
Sweet Corn	813,813	530,156	283,657	81,045	1.54
Shallot	4,883,977	2,584,117	2,299,860	1,116,437	1.89
Garlic	4,500,792	2,927,732	1,573,060	491,581	1.54
Chili	5,776,908	1,929,565	3,847,343	1,308,620	2.90

Source: DIPERTA 1 NTB

(8) Export

According to the statistical data in 1994, approximately 27,000 ton of rice, 25,600 ton of soybean, 4,500 ton of maize, 10,300 ton of mung bean, 2,800 ton of peanut, 8,000 ton of chili, 4,500 ton of garlic, 2,600 ton of copra, 1,400 ton of capok, 12,800 ton of tamarind, 8,500 ton of tobacco and 829 ton of cotton are shipped respectively to other province. 230 ton of cashew nut, 70 ton of arca palm seed, 19 ton of castor oil seed are exported to the other countries.

C.2.2 Farming practice

(1) Rice cultivation

Rice cultivation starts in November-December according to the availability of water resources. It delays usually in east Lombok as well as in Sumbawa region. Harvesting starts at the end of February to March. Second rice cultivation starts as soon as the harvesting of first crop of rice is completed and harvest in July to August where irrigation facility is available.

There are 4 main seed centers and 17 sub-centers for paddy, palawija and horticulture crops in NTB. More than 98% of farmers has planted high yielding variety of rice. Major high yielding varieties are IR64, IR66, and PB36. An average yield per hectare

in NTB is 4,538 kg in the lowland and 2,151 kg in the upland.

Seedlings are raised at irrigated area, while direct sowing (Gogo renca) is commonly practiced at the rain-fed area of 16,000 ha in Central and East Lombok since 1970. Land preparation, broken soil layer by iron bar or pick and make clod into pieces by wooden hammer, will be started in September till November. 40 kg of seed, 5-7 grains per hole, distance of 20 cm square, will be sown into the hole made by stick before rain starts. The field will be flooded by the rainfall after germination. Those field works will be done by joint work of farmers group consists of 20-30 persons, so called "Gotong royong system".

Direct sowing of rice is also commonly practiced at upland area. Low land rice, IR 66, IR 64 and PB 36, are usually planted at upland rain-fed area. The cropping system of rice cultivation practiced is inter-cropping or mix cropping with fruit tree or rice-corn-cassava.

Weeding practice is the one of heavy works for farmers at rice direct sowing area as well as rain-fed rice field. It requires 25-30 persons per hectare with cost of 75,000 RP-90,000 RP for one time weeding.

Major pests and diseases are Rice bag, Rice leaf roller, Stem borer, Army worm, Brown plant hopper, Kresak, Blast and Tungro virus. Total 8-10% of area will be damaged every year by pests and diseases. Serious damages by Locust are reported from Pemongkong village, Keruak district in East Lombok region.

Farmers who have more than 0.2 ha of land, usually employ labor for land preparation, transplanting and harvesting work, because timely work is required to get good yield as well as for planting palawija crops after paddy. Harvesting paddy is generally done by contract system with share of 1/10 of produce in Lombok region, while 1/6 in Sumbawa region because of shortage of labors. Harvesting labors come from Lombok island with their threshing machine and bring back paddy to their place.

Paddy is cut from bottom by sickle and threshed by hitting to the threshing stand by hand and cleaned by natural wind in the field and carried by manpower up to the road side where transportation is available. The cleaned paddy is sold generally to the middle man or rice mill agent at the road side immediately without drying. Paddy

straws are burned in the field where second crop of rice will be planted, while it is utilized as malting materials for soy bean at rain-fed area. Paddy for home consumption will be brought to their home and dried at farm yard. Common farmers could not sell paddy to KUD directory due to lack of transportation.

(2) Palawija crops

Palawija crops are cultivated both in lowland and upland. Main crop of lowland is soy bean. 30-40 kg of seed is broadcasted immediately after harvesting rice and covered by paddy straw. Simple drainage is usually provided.

Palawija crops for upland are soybean, mung bean, corn, cassava, sweet potato and peanut. There are two types of cultivation, one is mono-culture and the other one is mixed cropping. Planting season is November to December depending on rain. The soil is plowed and harrowed. Seeds are sown into the hole made by stick.

Paddy, corn and cassava are usually planted in mixed condition at transmigration area. Paddy is planted (30 cm x 15 cm) in November and corn is planted 2m row to row, 60 cm plant to plant after germination of paddy and cassava stem is planted 1m distance after one month of sowing paddy. Corn will be harvested in March, paddy in April and only cassava will remain in the field up to September. Paddy is for home consumption, corn and cassava are for selling purpose.

At the hilly and mountainous area in Sumbawa, the Mung bean cultivation is commonly practiced by direct sowing to the bush land of 'Sentalo'. 20 kg of seed is broadcasted and the grasses are cut from bottom for malting mung bean. The seed is sown during January to February and harvested April to May without fertilizer application. The yield of mung bean by this method is estimated 600 kg/ha. They transfer to the next plot if soil fertility is reduced (Sifting cultivation).

Peanut is planted mostly to the brown Regosol area as inter crops of cashew or mango tree in West Lombok (8,600 ha) and central Lombok (5,212 ha) region. Sweet potato is planted mainly in Central Lombok (1,431 ha), East Lombok (1,128 ha) and West Lombok (802 ha) region.

Major pest and disease for palawija crops are Seedling fly, Army worm, leafhopper and grass hopper for soybean, virus disease for peanut, Army worm and seedling fly

for mung bean and Army worm, seedling fly and Down mildew for corn. The area of Insect and disease damage is reported 3% of soybean and 1.5% of corn in 1994.

High yielding varieties of palawija crops are planted still less in farmers field compared with rice variety. Major high yielding varieties recommended are Willis, Tampomas and Krakatau for soybean, Gaja and Kelinchi for peanut, Arjuna for corn, Gajah, Zebra and Kelinchi for peanut and Walet and Kelinchi for mung bean respectively. An average yield per hectare of major palawija crops in 1994 is 1,860 kg, 987 kg, 1,068 kg, 571 kg, 10,922 kg, and 11,475 kg of corn, soy bean, peanut, mung bean, cassava and sweet potato respectively.

Harvesting palawija crops will be done by employed labor or farmers themselves. Palawija crops are for selling purposes. The products will be collected by village agent and sold to the middle man. KUD also purchases soybean and it will be sold as seed if it passed seed certification test.

The price of products is shown in Table C.2.4.

Table C.2.4 Price of Paddy, Palawija and Vegetable in NTB in 1994

Commodity	Farm Yard Level (Rp/kg)	Whole Sell Level (Rp/kg)	Consumer Level (Rp/kg)
Soy Bean	650	970	1,260
Corn	200	329	400
Cassava	100	-	160
Peanut	500	1,752	2,140
Shallot	500	1,015	1,190
Garlic	700	3,856	4,590
Paddy	319	-	670

Source: Agricultural statistic, KANWIL NTB

There is a big difference of price between farmers level and wholesale, specially peanut, shallot and garlic. The reason may be caused by transportation cost from farm yard to market or may be other reasons.

(3) Vegetable crop

Major vegetable crops cultivated in NTB are shallot, garlic, beans, tomato, egg plant, spinach, chili, cucumber and water grass. Cassava leaf, banana flower, tori leaf, young jack fruit, sweet potato stem are also utilized as vegetable. Farm yard is utilized

planting vegetable and fruit tree for home consumption. Shallot, chili, garlic, beans, cucumber and egg plant are planted for commercial purposes. Famous production area of shallot is Bima (5,676 ha), East Lombok (2,213 ha) and West Lombok (1,536) and chili in East Lombok (4,542 ha), beans in Sumbawa (1,777 ha), garlic in East Lombok (13,049 ha) and tomato in East Lombok (297 ha) region.

Chili is cultivated both in lowland, April-June after harvesting rice and in upland both rain and dry season. Seedling will be raised during January-March in the plastic pots at farm yard or directly in the field. Chili cultivation requires more farm labor (134 man day) but less production materials (250,000 RP/ha) than others. 300 kg of Urea, each 75 kg of TSP and KCL are applied by farmers. An average production of chili is 2,067 kg/ha but it ranges from 5,603 kg/ha in Sumbawa to 1,252 kg/ha in West Lombok region due to amount of rainfall and time of planting. Harvesting works are done 4-5 times by contract system (1000 RP/kg). According to farmers, there is fluctuation of price, 500 RP/kg-4000 RP/kg, by season.

Shallot is also cultivated both in lowland and in upland. The famous cultivation area is Bima region in Sumbawa island (5,676 ha) and East Lombok (2,213 ha) and West Lombok (1,536 ha) region. Shallot is cultivated 2-3 times a year because short duration of 2 month. 173 man days is required for shallot cultivation at farmers level. Cost of production materials is relatively high (1,027,235 RP/ha) because of high seed price. It requires about 700-800 kg for one hectare with cost of 5-600,000 RP. Many farmers want to plant shallot for their farm management improvement, it is most profitable crop, but they are not able to buy seeds due to lack of fund. 200 kg/ha of urea and each 100 kg/ha of TSP and KCL are applied at farmers level. An average production of shallot is 7,314 kg/ha.

Garlic is planted in rather high elevation of 300-400m from sea level. The famous production area is in East Lombok (1,471 ha) region. Duration is 3.2 month. It is planted after harvesting rice from April to July. The labor requirement is 190 man days, 21% for land preparation, 12% for planting, 27% for weeding and 23% for harvesting. Required seed is required 450 kg/ha with cost of 900,000 RP. 700 kg of Urea, each 100 kg/ha of TSP and KCL are applied by farmers. An average production of garlic is 8,152 kg/ha.

(4) Animal husbandry

There are 413,293 head of cows and 214,716 buffaloes in NTB. Milking cow is not yet developed because farmers need more development of cows for plowing the land, also they have not a custom to drink fresh milk. Cows and buffaloes are raised intensively in Lombok with cattle shed, but extensively in Sumbawa island. Development of local chickens is more emphasized from the point of view on farmers nutrition. Pig is raised by Hindu peoples for their own consumption in West Lombok region. Number of animals is shown in Table C.2.5

Table C.2.5 Number of Animals in NTB in 1993.

	West Lombok	Central Lombok	East Lombok	Sumbawa	Dompu	Bima	Total
Horse	8,077	5,393	9,208	40,070	4,913	11,630	79,291
Cow	90,723	89,912	98,415	52,847	2,903	58,466	393,266
Buffalo	8,813	30,066	11,748	103,782	7,071	43,336	204,816
Goat	28,064	54,520	83,426	19,164	9,644	64,139	258,957
Sheep	6,835	7,463	12,425	1,825	-	6,830	6,830
Pig	21,770	623	-	557	-	-	557
Chicken	878,170	1,517,967	1,627,068	334,472	168,736	378,439	4,904,852
Broiler	56,850	41,879		5,650	7,000	4,522	17,172
Duck	72,774	247,835		19,192	10,113	30,064	59,369

Source: Annual Report, Animal husbandry office in NTB

C.2.3 Supporting system

(1) Agricultural research station

Mataram agricultural research station (IPPTP Mataram) ,ex-Agricultural Information Center which transferred from Agency for Agricultural Education and Training to the Agency for Agricultural Research and Development in 1994 , belongs under the Naibonat Agricultural research station located in Nusa Tenggara Timur province and it is located at urban area of Mataram city.

IPPTP Mataram has 1 ha of land with office, library , houses and 2 units of mobile. The research field, laboratory and green house are not yet provided. There are 44 staff, one head of station, 2 research officers, 4 subject matter specialists, 10 technicians, 26 administrative staff and others.

IPPTP Sandubaya is located in Sumbawa island, has 52 staff members, one head of center, 5 agronomists, 2 entomologists, 1 economist, 1 veterinarian and others. IPPTP Sandubaya has 7 ha of land, pest & disease laboratories, green house, office, houses and one unit of mobile

Functions of IPPTP are applied research, extension, library works and extension material development. The implementation items are as follows:

- Research work on agricultural commodities at specific location.
- Trial and development effective agricultural technology at specific location.
- Improvement of research program by feed back.
- Preparation of technical packet, as extension materials , based on the trial results.
- Technical services to the agricultural technique application.

Due to lack of research staff members in IPPTP, the research and trial works at farmers field are done by cooperation with subject matter specialists and extension workers at regional and district level as well as key farmers and farmers group at specific location.

19 units of field trials, 10 units of technical application programs, 5 times of technical meeting of subject matter specialist, 5 times of field technical meeting with farmers group, 4 units of farmers cooperative farm management projects, 4 times of farmers meeting, 28 units of field demonstration, 12 times of exhibition, 5 times of field school, 5 times of farmers coaching, 4 times of production competition, 43 times of radio broadcasting, publication of 39 kinds of pamphlets and 3 kinds of leaflets are implemented in 1994 in cooperation and coordination with agricultural offices at regional and district level and faculty of agriculture, Mataram university.

(2) Farmers cooperative

NTB province is consists of 6 region, 60 districts and 580 villages. There are 134 farmers cooperatives (KUD) with 231,517 members in 1994. One KUD covers 4.3 villages with 1,728 members in average. 85 KUD are developing and 47 KUD has been stabilized and remaining 2 KUD has dropped activity.

Each KUD has one manager (62 academy or university graduate, 72 high school graduate) and total staff members of KUD are 1.369 persons among 1,022 persons are

permanent employees. There are 1,432 fertilizer stock go downs at farmers group level to make smooth distribution of production materials.

Activities of KUD depend on their objectives, in general, distribution of production materials such as fertilizer and chemicals, procurement of food crops, selling goods necessities of life, rice mill management, cooperative shipping of products, saving and loan and others.

Number of KUD and members are shown in Table C.2.6

Table C.2.6. Number of KUD and Members and Supporting Facility in NTB

Region	District	Village	KUD	Storage	Kiosk	Members
West Lombok	12	83	20	246	183	61,696
Central Lombok	9	86	28	316	404	47,577
East Lombok	10	98	24	267	17	60,108
Sumbawa	14	128	26	215	32	21,023
Dompu	5	42	14	47	11	12,254
Bima	10	143	22	138	25	28,859
Total	60	580	134	1,229	672	231,517

Source: Annual report, Agricultural Food Crop Office in NTB

KUD for milking cow, 18 KUD for fattening cow, 31 KUD for local chicken, 10 KUD for goat/sheep, 3 KUD for honey, 11 KUD for fish, 2 KUD for sea weed, 1 KUD for sea fishing and 2 KUD for frog culture have been operating 125 (93%) KUD are conducting saving and loan activities, 60 KUD (44.8%) for electric supply loan, 121 KUD (90%) have shops, 10 KUD (7.5%) have telephone houses and 23 KUD (17.2%) have fuel stands.

KUD buy paddy from farmers at 450 RP/kg and selling to DOLOG/BULOG at 738 RP/kg (730 RP/kg from non KUD). 90 KUD purchased total 24,829t of paddy from farmers and 13,049t of rice and sold 9,002t of rice to the DOLOG in 1994.

Total 97 units of rice mills(84 units are in good condition), 5 units of rice refiners, 12 units of rice winnowing machines, 5 units of power threshers, 3 units of power tillers, 1 unit of dryer, 8 units of mini tractors(all out of order), 2 units of 4-wheel tractors, 2

units of hammer corn mills, 12 units of moisture testers are supplied by KR-2 grant aid and OECF loan to the KUD in NTB.

(3) Extension office

Administration of Rural Agricultural Extension Offices (BPP) is transferred from Agency for Agricultural Education and Training to the Agricultural Regional Office in each province and it is specialized in 4 sub-sectors since 1994. Total BPPs in NTB are 52 units, 12 for animal husbandry, 13 for estate, 9 for fishery and 18 for food crop respectively. One BPP covers about one district with 11 villages. 79 subject matter specialists(PPS) are assigned to the province offices, regional offices and agricultural research station to conduct extension administration, research works and training of extension workers and farmers. 968 PPLs are assigned to BPP and guide farmers groups. One PPL covers 1.5 villages for agricultural food crop and 3.2 villages for animal husbandry section at present. One animal health post is provided in each district level. Number of BPP and extension personnel are shown in Table C.2.7

Table C.2.7 Number of BPP and Extension Personnel in NTB in 1994

Sector	BPP	PPS	PPL
Animal Husbandry	12	20	179
Fishery	9	17	118
Estate Crop	13	17	272
Food Crop	18	25	399
Total	52	79	968

Source: Agricultural statistic, KANWIL Pertanian NTB

There are 5,462 farmers groups with 313,151 membership, among which 5% of groups is well developed, 37% is developed, 47% is developing and remaining 11% is still under developing. About 44.5% of group members joined to KUD members, 441 members and 233 key farmers are employed as executing member of KUD.

C.3 Water Resources and Irrigation

C.3.1 Previous Study for Water Resources

Several major studies have been made on the water resources of NTB since the early 1970s, primarily in connection with irrigation. The most important previous studies are listed as shown in Table C.3.1.

Table C.3.1 Previous Water Resources Studies and Investigations

Name of Study/ Investigation	Institution / Company	Date of Report
Hydrogeology of the island of Lombok	Geological Survey of Indonesia	1972
Penyelidikan Hidrologi P.Lombok	Direktorat Geologi	1976
Lombok Island Water Resources Development Phase 1	CIDA	Dec. 1975
Lombok Island Water Resources Development Phase 2	CIDA	May 1978
Lombok Island Groundwater Investigation	ELC - Electroconsult	Oct. 1986
Lombok Island Groundwater Development	ELC - Electroconsult	Feb. 1992
Lombok Water Supply Project	PT NAKARYA SEMBADA	June 1992
Needs Assessment and Assistance in the Preparation of Water Resources Management Plan	CIDA	Apr. 1993
Feasibility Study on the Embung Development Project	JICA	May 1995
Special Study Report on Future SSIMP	OECD	July 1993
Sumbawa Water Resources Development Study (SSIMP)	OECD	Sep. 1995

The potentiality of water resources in NTB has been clarified through these studies. Several water resources development projects such as small scale reservoir development, groundwater development, etc. have been carried out based on the result of these studies.

C.3.2 Present Condition of Irrigation Scheme

According to the information of the Irrigation Project Office in Mataram, there are about 250 irrigation schemes covering approximately 161,000 ha of paddy field and about 30 schemes with 17,000 ha are expected to be improved. As there is not sufficient irrigation water in the dry season, 60% of these area is not irrigated for second crop.

Groundwater is one of the main irrigation water resources and groundwater system is to applied at approximately 30 % of irrigated area. The major problems of groundwater system are categorized as below;

- Insufficient well capacity
- Insufficient pump capacity
- Insufficient farmers fund for operation

C.3.3 General Aspects of On-going Projects

There are five major on-going projects concerning irrigation and drainage in NTB and general aspects of these projects are summarized as shown in Table C.3.2.

Table C.3.2 Summary of On-going Irrigation and Drainage Projects in NTB

Name of Projects	Period	Financial Source	Objectives	Activities
Development and Conservation of Water Resources Project	1994 ~ 1999	GOI	Development and conservation of water resources for 38,000 ha of irrigated area.	Head works 7 sites Small pond 33 sites Rehabilitation of small pond 92 sites
Irrigation Improvement Project	1994 ~ 1999	GOI	O/M and rehabilitation of irrigation scheme for 199,000 ha of irrigated area.	O/M 24 schemes, 105,000 ha Rehabilitation of main canal 60 schemes, 49,000 ha Rehabilitation of terminal system 331 schemes, 16,000 ha
Spring water and flood control project	1994 ~ 1999	GOI	Improvement of drainage system for 68,000 ha of agricultural land	16 projects for poor drainage area
Integrated Irrigation Sector Project II (IISP-II)	1996 ~ 2000	ADB	Integrated irrigation improvement for 17,000 ha of irrigated land	Diversion weir 1 site Dam construction 2 sites Improvement of irrigation scheme 78 scheme, Training for O/M
Small Scale Irrigation Management Project II (SSIMP-II)	1995 ~ 1999	OECP	Improvement of irrigation system for 16,000 ha of irrigated land	Diversion weir 4 sites Small dam 4 sites Groundwater 3 sites Training for O/M

C.4 Proposed Basic Development Concepts

C.4.1 Development Needs and Constraints

An economical structure in NTB has been changing from agriculture to non agricultural field since last 10 years. Agricultural field shares 45.09% of gross regional domestic product (GRDP) in 1993, while 51.77% in 1983.

Food crop section shares 66%, 15% of animal husbandry, 11% of fishery and 8% of estate crops from total GRDP in agricultural field. Total population in NTB is 3,368,699 persons in 1990, while 2,723,678 persons in 1980. An average population increase in NTB is 2.15% , 4.22% in Dompu (highest) and 1.64% (lowest) in Central Lombok region. An average population density in NTB is 167/Km², Lombok island of 474/km² and 64/km² in Sumbawa island respectively.

Working population is 1,329,851 persons, 953,043 male and 376,808 female, in 1993. 11.4% of total area in NTB is utilized for rice cultivation, 8.7% for upland food crops, and 2.1% for estate crops and remaining area is 11% for bush and grass field and 64% for forest area. 22.1% of potential area for animal husbandry, 36.2% of potential area for sea fishing, 23.9% of potential area for estate crops are only utilized at present.

NTB province has basically surplus rice production of about 270,000 ton of rice, among which 27,000 ton is shipped to other province through proper channel in 1994. NTB is expected to be one of significant areas as main agricultural production supply base for Indonesia. On the other hand, as irrigation water is not sufficient throughout a year, mainly palawija crops are planted in the dry season. From the view point of farmers' living standard improvement, crop diversification in the dry season shall be one of main countermeasure while maintaining the present rice production.

Based on the result of field survey, the development constraints in NTB are summarized as below:

Population in NTB is not distributed ideal among provinces so that surplus of labors become problem in Lombok island, while labor shortage is in Sumbawa island.

As the dry season is expected to be 5-6 months in a year, it is necessary to seed for

palawija crops before commencement of dry season when the soil moisture is sufficient for the crops. It is necessary, therefore, to finish the harvesting work as soon as possible in the rainfed paddy field. Especially, in Sumbawa island, farming labor force is insufficient for harvesting work, and seasonal farming labors come from Lombok island and cost of harvesting paddy becomes comparatively high, 1/6 of total production, while 1/10 in Lombok island.

Considering the size of paddy field (201,000 ha) and necessity of timely work of land preparation before rain starts, development of agricultural machinery such as 4-wheel tractor, hand tractor, thresher and others are still limited in NTB. There are 52 units of 4-wheel tractors (1 unit/4,000 ha), 600 units of hand tractors (1 unit/340 ha) and 222 units of power threshers (1 unit/2,000 ha).

There is 16,000 ha of rain-fed paddy field which belongs to alluvial soil in Central and Eastern Lombok region, the crack of soil caused by drying up is observed in the dry season. On the other hand, for farming practice of rain-fed paddy with direct seeding, it is necessary to finish the plowing and seeding before the first rain at the commencement of rainy season. In this area, it is impossible to plow the land by using cattle or hand tractor, therefore, the farmers take the traditional way of plowing by manpower. The cost of this operation is estimated as Rp. 300,000/ha. PT. Pertani is operating land plowing by contract base with 4-wheel tractor (65 HP) which costs 175,000 Rp/ha. However, there are only 23 unit of 4-wheel tractors (procured through KR-2 program) possessed by PT. Pertani and the number of machinery is not sufficient for completing plowing within the short period.

Palawija is the main crops in the dry season at present. Farmers intend to diversify their farm management by introducing the cash crops such as chili, tobacco and others. However, insufficiency of the irrigation water resources in the dry season is one of the big constraints to diversify the crop. Considering the potential of the water resources development, several study reports suggested small scale water development project such as construction of small reservoir, installation of grand water system and improvement of water management system to be improved.

Due to the lack of extension officers, facilities and equipment, farmers can not obtain suitable integrated extension services, information and technology for appropriate farming practice. Knowledge and skills of extension workers must be improved in order

to answer the farmers needs for farm management improvement.

Agricultural research station is newly organized in NTB since 1994, therefore, necessary facilities, equipment and research personal are not yet provided fully. Also the extension materials in specific location is not yet developed well. Selection of high yielding variety of palawija crops and adaptation by farmers as well as yield of palawija crops must be developed by strengthening research and extension activities.

An average land holding in NTB is relatively small as 0.3 ha per farm household. For these small scale farmers, it is difficult to make a initial investment for new action such as introducing the new promising crops (chili, shallot, garlic, pineapple and others), mechanization and others due to shortage of fund. Therefore, the most of such farmers are forced to cultivate in the traditional production system.

The marketing system of vegetable crops, especially, chili, shallot and garlic must be improved. Because farm yard price of these product is extremely low compared with other palawija crops. Present system of marketing of "Farmer-Middle man-Wholesaler-Consumer" must be improved by introduction of cooperative shipping system together with reinforcement of KUD activity.

Labor productivity in the field of agriculture must be elevated not only for farming process but also for others such as preparation of farming input, introduction of agribusiness and marketing of product in order to increase farm income.

C.4.2 Proposed Basic Development Concepts

Considering the conditions in NTB mentioned above, the agricultural development stage in NTB is clarified as below:

With the consideration of the condition mentioned above, following concepts of agricultural development are proposed.

- To extend and enforce the supporting systems for the farmers (extension of farming technology, promotion of appropriate mechanization, improvement of marketing system including agribusiness, strengthen of sufficient fund for farming management, enforcement of farmers organization and others) to improve their

agricultural management.

- To improve irrigation facilities and water management system based on the potentiality of water resources for diversification of second crop in the dry season.
- To conduct research and introduce suitable crop and farming technology for the area where the potentiality of water resources for irrigation does not exist.

C.4.3 Proposed Activity in NTB

Based on the above proposed concept, following activities or programs are suggested

(1) Development supporting system for farmers.

- a. Strengthen the extension activities (Component 3)
 - Practical training to the extension officer
 - Preparation of extension materials and transportation facilities
 - Farmers guidance through setting up demonstration field and through proving by practical training in field
- b. Development of appropriate mechanization. (Component 3)
 - Plowing and harrowing soil by using 4-wheel tractor at rain-fed rice direct sowing area by contract base
 - Harvesting (Reaper) and threshing of paddy (Power thresher) in labor shortage area
 - Development of cattle for plowing land in transmigration area
- c. Improvement of marketing system.
 - Promotion of area production (Component 3)
 - Promotion of cooperative shipping of products (Component 6)
 - Introduction of post harvesting technology including agribusiness (Component 7)
 - Strengthen of KUD activities (Component 1, 6)
- d. Development of credit system. (Component 5)
 - Strengthen of farmers credit for introduction of new commodity, mechanization, livestock and agribusiness

- c. Enforcement of farmers organization. (Component 6)
- (2) Development of diversification of second crops by expanding of small scale irrigation facilities and improving of water management.
 - a. Development of ground water irrigation system (Component 4)
 - b. Construction of small scale reservoir (Component 4)
 - c. Guidance to water users association on water management (Component 3,6)
- (3) Development of suitable and profitable crops and its' farming technology.
 - a. Selection of crops, cropping system and demonstration (Component 2,3)
 - b. Propagation and distribution of fruit tree seedling(Component 2,3)
 - c. Pest and disease control on palawija crop and fruit tree(Component 2,3)
 - d. Weeds control technology for rainfed rice cultivation(Component 2,3)

Reference for NTB

1. Statistic Pertanian, NTB 1994. KANWIL Pertanian, NTB.
2. NTB dalam Angka, Kantor perwakilan BPS dengan BAPPEDA, NTB.
3. Laporan Tahunan 1994/1995, Dinas Pertanian Tanaman Pangan Daerah TK 1 NTB.
4. Rencana Induk Pengkajian teknologi Pertanian, NTB.
5. Repelita VI Pertanian, NTB.
6. Laporan Tahunan 1994/1995, Dinas Perikanan Daerah TK 1 NTB.
7. Laporan Tahunan 1994/1995, Dinas Perternakan Daerah TK 1 NTB.
8. Laporan Tahunan 1994/1995, Dinas Perkebunan Daerah TK 1 NTB.
9. Laporan KANWIL Dept. Koperasi dan PPK Propinsi NTB 1995/1996.
10. Proyek Pembangunan Pertanian Rakyat Terpadu, 1995/1996.
11. Laporan Tahunan, KANWIL Transmigrasi di NTB, 1994/1995.
12. Laporan Tahunan, KANWIL Departmen Koperasi, NTB 1995.
13. Laporan Kegiatan Analisa Usahatani Pangan DIPERRTA NTB, 1993.
14. Laporan Kegiatan Analisa Usahatani Palawija dan Hortikultura, DIPERTA NTB, MT 1993.
15. Rencana Pembangunan Lima Tahun Ke Enam Propinsi DT 1, NTB - Buku 1-Buku V.
16. Buku Pedoman Fakultas Pertanian, Universitas Mataram 1993.
17. Monografi Desa Lopok.
18. Monografi Desa Lape.
19. Kecamatan Plampang dalam Angka 1994.
20. Proyek Pembangunan Perkebunan Rakyat Terpadu 1996/1997.
22. Monografi Kecamatan Pringgabaya.
23. Laporan Tahunan Diperta Tanaman Pangan, Kab. DATI II Sumbawa, 1994/1995.
24. Monografi Desa Swela.
25. Monografi Desa Pringgabaya.
26. Dalam Angka Kec. Keruak.
27. Dalam Angka Kec. Pelampang.
28. Dalam Angka Kec. Pujut.
29. Calon Lokasi Proyek Umbrela Cooperation III, KANWIL Pertanian NTB.

APPENDIX D:
RESULTS OF FIELD SURVEY OF SOUTH KALIMANTAN

**THE STUDY
ON
THE THIRD UMBRELLA COOPERATION
FOR
INTEGRATED AGRICULTURAL AND RURAL DEVELOPMENT
IN
THE REPUBLIC OF INDONESIA**

DRAFT FINAL REPORT

APPENDIX D : RESULTS OF FIELD SURVEY OF SOUTH KALIMANTAN

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APPENDIX D CONTENTS OF RESULT OF FIELD SURVEY OF SOUTH KALIMANTAN

D.1 GENERAL

D.1.1 Agro-ecosystem of South Kalimantan

(1) Natural Conditions

This area is under effects of the tide or tidal backwater and so it could be largely categorized into "Tidal Swamp" and "Inland Swamp" areas. The tidal swamp area is directly effected by the tidal / tidal backwater such as Barito River basin. This type of swamp is called pasang surut in local language. On the other hand, the inland swamp area is formed by effect of the geographical features. One of inland swamp areas, called Lebak (local name) is largely effected by rainfall , which is subjected to severe flood in rainy season and runs short of water in dry season. The altitude in study area varies between 0 to 2 m, which is low and also scarcely undulating. Peat soils developed in the area and are mixed with sediments brought along the rivers and water courses. Annual rainfall ranges from 1,800 mm to 2,400 mm, mean temperature is around 27°C(Refer to Table D.1.2).

(2) Socio-economic Conditions

Agriculture is the most important sector, occupying 58% of the labor force. Rice is self-supplied and some of them are exported to other provinces together with fruits such as oranges and banana. The area has a relatively well maintained road net work except farm road and also transportation boats.

(3) Agricultural Condition

Table D.1.1 shows the cultivated area and production of main crops in the study area and other provinces. As shown by the figure, rice is the major crop in the area, occupying 72% of total cultivated land. Cultivated area of palawija and other horticultural crops is limited. Most of them are cultivated on the Sorjan (2~3 m in width wider levee paddy fields) Typical cropping pattern followed in the study area is shown in figure D.1.1.

Farming scale is relatively small comparing with the other provinces, that is about

Table D.1.1 Cultivated area / production amount of main crops in South Kalimantan in 1994

City/district	Kind	Paddy rice	Upland rice	Cassava	Corn	Peanut	String bean	Cucumber	Banana	Orange	Rambootan	Rubber	Coconut
Banjarmasin	Area(ha)	2,449	0	0	0	0	0	4	0	6	106	40	971
	Amount(t)	6,564	0	0	0	0	0	8	0	15	1,641	332	543
Banjarn	Area(ha)	58,836	2,908	365	2,125	3,838	213	315	1,598	446	377	15,787	3,056
	Amount(t)	155,074	6,520	3,325	2,647	3,523	594	1,083	4,329	3,874	2,100	16,294	2,142
Tapin	Area(ha)	34,248	3,195	227	1,148	1818	208	24	1,004	48	100	7,826	1,434
	Amount(t)	117,151	7,702	2,450	1,272	1,084	521	95	2,513	616	785	6,736	1,406
Barito kuala	Area(ha)	85,423	0	433	116	21	192	44	654	1,599	2,444	0	11,611
	Amount(t)	211,638	0	3,050	112	15	117	188	1,455	20,902	9,401	0	14,534
H.S.S	Area(ha)	28,456	4,062	207	671	1,037	117	65	254	31	189	4,624	7,320
	Amount(t)	111,853	8,766	1,813	699	864	259	20	630	370	1,265	2,775	12,278
H.S.T	Area(ha)	26,100	1,667	333	554	308	154	95	704	117	230	7,756	4,162
	Amount(t)	97,405	3,964	3,732	631	268	405	390	2,349	1,564	1,666	5,200	4,950
H.S.U	Area(ha)	38,033	2,405	291	499	511	191	77	608	95	386	15,592	2,070
	Amount(t)	120,090	5,268	2,497	609	381	460	210	1,858	969	1,453	10,701	2,138
Tabalong	Area(ha)	16,971	3,969	357	415	275	144	55	260	31	341	17,349	2,843
	Amount(t)	60,716	7,288	3,419	441	2,205	465	160	786	344	1,977	12,570	2,434
Tanah laut	Area(ha)	42,862	4,315	2,250	3,615	2,187	282	166	708	73	188	898	2,026
	Amount(t)	111,175	8,226	25,698	4,357	1,992	623	674	1,560	870	824	916	1,660
Kotabaru	Area(ha)	17,078	17,365	4,208	5,829	4,188	383	240	308	191	883	7,888	7,536
	Amount(t)	48,638	37,405	48,457	7,382	4,027	904	1,352	751	2,106	3,242	5,312	6,036
Total	Area(ha)	350,456	39,886	8,671	14,972	14,183	1,888	1,081	6,104	2,737	5,178	77,720	43,029
	Amount(t)	1,040,304	85,139	94,401	18,150	14,359	4,356	4,172	16,246	33,256	23,045	60,504	48,126

Study area

Source : Dinas Pertanian Tanaman Pangan Propinsi DATU Kal-Sel

70 % of land holding farmers cultivate less than 1 ha. Also 60% of farmers do not have their own land.

Together with rice cultivation, fishery is also popular not only to get extra income but also as their protein source which is valuable for their life.

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Rice (Single cropping)	△		△	△				×	×	○	○	△
		2nd	3rd									1st
Rice (Double cropping)	△		△	△				×	×	○	○	△
		×	×							○	○	△
Palawija, Vegetable				○	○		×	×	○	○		×
Fruit (Orange, Rambutan)			×									×

○.....○ Sowing / Seedling raising △.....△ Transplanting ×.....× Harvest

Fig.D.1.1 Typical cropping pattern in study area

D.1.2 General aspects of the Study Area

Tapin, Banjar and Barito Kuala districts were chosen as study area based on the following concept.

- To cover the proposed / on going project site
- To cover the typical area representing an agro-ecosystem
- Area which has potential to develop agriculture

General aspects of each district are shown in Table D.1.2.

D.2 AGRICULTURE

D.2.1 General Aspects of Rice Cultivation

Rice cultivation can be classified into two categories . One is the single cropping system by using local varieties. It is traditional and also popular among the farmers. The other is double cropping system using the combination of local varieties and improved varieties. With the improvement of water management system and also cultivation technology, double cropping of rice have become popular in Tapin and a part of Banjar district where improved varieties can match with the natural conditions.

General aspects of each variety are shown in Table D.2.1.

Table D.1.2 General Aspects of Study Area in South Kalimantan

Item	District	Tapin	Banjar	Barito kuala	Province
Area (ha)		231,500	622,800	328,400	3,698,500
Population		130,609	456,490	230,305	2,680,398
Access to Banjarmasin					
Distance from capital		120 km	50 km	60 km	
Transportation		Land route	Land route	Boating / Land	
Road condition		Paved	Paved	Partially	
Time (by wheel drive car)		About 3.5 hr	About 1.5 hr	About 2.5 hr	
Climate					
Annual mean temperature (°C)		27.0	26.4	NA	
Annual rainfall (mm)		2,114	1,846	2,432	
Land use (ha)					
- Paddy field		88,788	70,711	99,226	516,494
Irrigated area (Completed)		589	4,107	0	15,539
Irrigated area (Not completed)		1,992	6,312	0	27,126
Rain fed		22,972	19,395	0	122,664
Swamp ※		14,885	35,957	87,548	219,097
No cultivation		48,350	4,940	11,678	132,068
- Upland (Palawija, Horticulture)		23,033	41,909	9,722	284,665
- Estate crop		10,810	44,479	13,729	261,958
- Aquaculture		16,617	4,503	476	32,620
- Forest		34,213	100,732	74,927	716,739
- Swamp (No cultivation)		15,710	20,498	25,131	409,618
- Housing site		7,681	19,179	15,914	128,002
- Grass land		2,220	42,947	10,639	146,355
- Others		32,428	277,842	78,636	1,202,099

※ Include the tidal irrigation area

Source : Dinas Pertanian Tanaman Pangan Prop. Dati 1 Kal-Sel

D.2.2 Farming practice

As shown in Table D.2.2 , rice cultivation farmers depend on manpower for most of field works using traditional tools, resulting in low labor efficiency . In this situation most of the farmers are forced to hire other labors when fanning work is concentrated. Cultivation of improved varieties require intense management than local varieties.

Table D.2.1 General Aspects of each Variety

	Local varieties	Improved Varieties
Main variety	Siam, Unease, Karang Duke, Lemo	IR 36, IR 42, IR 66
Characteristics	Late maturity (More than 150 days, depending on day length in productive stage) High photoperiodic sensibility	Early maturity (120 ~ 130 day) Low photoperiodic sensibility
Yield	2 ~ 3 t/ha (Unhulled rice)	3.5 ~ 4.5 t/ha (Unhulled rice)
Share of cultivated area	Tapin ; 50 ~ 60 % Banjar ; About 80 % Barito kuala ; 98 %	Tapin ; 40 ~ 50 % Banjar ; About 20 % Barito kuala ; 2 %
Farmers' price	968 RP/kg(Ave. of 3 districts)	600 RP/kg (Tapin)
Local market price	1,169 RP/kg(Ave. of 3 districts)	738 RP/kg (Tapin)

Table D.2.2 Rice Farming Practice in the Study Area (1/2)

Item	Description	Remark
Land preparation	Simultaneous weeding and puddling /leveling are done using Tajak (large sickle with special shape). Weed is piled in the field to make manure. Hand tractor is generally used by hiring operator in the area where double cropping is introduced.	Use of hand tractors ; Banjar ; 2 out of 10 farmers Tapin, Barito Kuala ; 1 out of 100 farmers Operator fee ; RP70,000/ha
Transplanting	(Local Var.) Transplanting is made 2 ~ 3 times from Oct. to Apr. to avoid the damage by flooding and also keep the appropriate plant density in accordance with the growth stages of seedling. Local tool called Tujah is used for making holes to plant the seedling. The upper part of seedling is cut when transplanted in order to prevent lodging and also to stimulate the growth. (Improved Var.) Transplanting is made one time. Nursing duration is about 30 days.	Labor efficiency is 0.05 ~ 0.1 ha/day/person Other labor force is often required. Wages is about RP 3.500 ~ 5.000/day.
Fertilizer application	Chemical fertilizer (Urea, TSP, KCL) is applied for improved varieties.	Application amount Urea ; 100 kg/ha TSP ; 50 ~ 100 kg/ha
Weed control	Weeding is done by sickle when needed	
Pest control	By the promotion of pest control programmed by local government hand sprayers / mist blowers are widely used among the farmers. Rat control is made in combination with following methods - Covering levee with a sheet - Fumigation in the nests - Attacking rats / nests with the stick	Chemicals commonly used; Farad (Stem boiler) Cabcide (Blast) Validacin(Sheath Blight) Fumigants(Rat)

Table D.2.2 Rice Farming Practice in the Study Area (2/2)

Item	Description	Remark
Harvest	(Local Var.) Only panicle is harvested by traditional tool called Ani-ani. (Improved. Var.) The stem around the ground is cut using sickle	Labor efficiency is 0.05 ~ 0.1 ha/day/person Extra labor force is often required. Wages RP 3.500 ~ 5.000/day
Threshing	There are three methods of threshing; done beating, trampling, and foot thresher. Trampling is done mainly for local varieties because of their high shattering characteristics. Foot thresher is used for improve var.	Use of foot thresher; Tapin: 7 out of 10 farmers Banjar : 1 out of 10 Barito Kuala : 1 out of 100 Other labor force is often required for threshing, cleaning and drying.
Cleaning	Locally made winnower are in wider is use for cleaning the harvested paddy	Wage is RP 400 ~ 500 /blek (10 ~ 11 kg of rice)
Drying	Harvests are open air dried under the sun.. Drying machine is not common in the area	
Transportation	Boat and bicycle are commonly used for carrying the harvests	

D.2.3 Supporting system

(1) Research institute

The research institute for food crops, affiliated to Ministry of Agriculture is re-organized in 1995 to have research focus on swamp area.

RIFSA (Research Institute for Food Crops on Swamp Area), which is located in Banjar district, has a total number of 167 staff consist of 70 researchers and 97 numbers of administration staff. Research activities in each division are as follows.

1) Breeding division

- Improvement of varieties resistant to natural conditions in swamp area such as flooding, saline water, iron toxicity and blast / sheath disease

2) Agronomy, agroecology division

- Improvement of soil management based on soil sampling and analysis
- Improvement of cultivation technology and cropping system according to different swamp / soil conditions

3) Division of post harvest technology and mechanization

- Increase of labor efficiency through appropriate mechanization technology
- Improvement of post harvest technology to prevent post harvest loss and also increase efficiency of the work

4) Pest control division

- Development of integrated pest management using pesticide and biological control for environmental safety

5) Agroecconomy division

- Establishment of integrated farming systems which lead increase of farmers' income

(2) Training Center

Training center for agriculture officials(BLPP) was established in 1978 in Binuang of the Tapin district. The center fosters human resources necessary for agricultural development through training provided not only to officials but also to PPL(extension workers) and farmers.

Outline of the center is as follows ;

1) Personal

Total number;	51
Head of the center / section ;	5
Administration staff ;	10
Instructor / technical staff ;	20
Others ;	16

2) Main activities

- Training the administration officials in the department of agriculture to promote the agricultural program and also their work efficiency.
- Training the technicians such as PPS /PPL and also farmers' group to upgrade their agricultural skill through giving lecture in the classroom and also practical training in the field
- To provide farmers with information of agricultural technology

D.3 WATER MANAGEMENT SYSTEM

Construction and improvement of irrigation / drainage facilities is promoted by Ministry of public works except for terminal canals which is the responsibility of Ministry of Agriculture.

Tidal irrigation is commonly practiced in the study area especially in Barito River Basin. In this area water can be let in the field by opening the gate set at the entrance of the second or tertiary canals and close the gate when too much water exists in the field. However, because of deteriorating conditions of facilities and also lack of farmers' technology, effective water management can not be made well in the area.

D.4 PROPOSED BASIC DEVELOPMENT CONCEPT

D.4.1 Development Needs and Constraints

Rice occupies 72% of the total cultivated area of main crops in the study area. This portion of paddy field is quite high compared to other Provinces. This is one of the specific characteristics of the province due to wide distribution of swamp area. Although the area has a large potential for agricultural development, it has sensitive nature which is needs to be considered for protecting environment. Therefore, the following consideration is necessary for agricultural development.

(1) Forest classification

About 57% of the total area of South Kalimantan is occupied by forest. Indonesian government has classified forest by its objectives and functions into the four classes, namely "protected forest", "conservation forest", "production forest" and "conversion forest".

"Protected forest" is established in the forest area having its important function such as management of water resources. Most of them are located in water catchment area such as high elevation, steep slope and high rainfall area. Cutting wood in this forest is prohibited.

"Conservation forest" is the forest area covering the habitat for valuable wildlife and

has high potential for tourist attraction such as national parks. Cutting wood in this forest is prohibited.

“Production forest” is mainly for wood production. It is classified into two types, namely “limited production forest” and “production forest” with an index measured by slope and annual rainfall. The method of wood cutting in this forest is the selection cutting method intending natural regeneration in principle. However, the cutting out method with artificial reproduction is adopted on barren land, on grass land and in the forest with low productivity. The criteria of cutting in forest with limited production is rather strict comparing with “production forest” because of the high productivity and the importance of land conservation function.

“Conversion forest” is the forest which could be changed into another classification to be utilized for agriculture, housing and etc.

Most of the land provided for people transmigrated under the government policies is located in this “conversion forest”. The land that has already converted to be utilized for agriculture and housing is going to be re-classified into other classification when revision of forest classification is executed. Most of the forest existing in swamp area in South Kalimantan has already been cut out and secondary forest has been dominating. The “production forest” is fixed in part of inland swamp area and the “protected forest” is fixed in small part of tidal swamp area in South Kalimantan.

The forest classification in South Kalimantan is summarized as bellow:

Forest Area	Area (ha)	Ratio to Gross State Area (%)
Protected Forest	110,365.0	3.0
Conservation Forest	387,143.0	10.5
Production Forest	1,309,716.0	35.4
Limited Production Forest	109,375.5	3.0
Conversion Forest	184,257.5	5.0
Total	2,100,857.0	56.9

Source: Statistics of Ministry of Forestry in South Kalimantan in 1994

(2) Protected species

The protected species include about 20 species of flora and about 100 species of fauna in South Kalimantan.

(3) Bio-diversity

Swamp area has diverse ecosystems. On the other hand, wet land is sensitive to the influence of man's activities and is very weak natural condition which could be destroyed easily by the contamination such as sanitary sewage, waste water from agricultural activities and etc. The swamp area in Kalimantan is 12,764,000 ha which is about 32% of all swamp area in Indonesia. Indonesia government has joined with "Ramsar Treaty" which is an international treaty for wet land conservation. Therefore the consideration regarding the conservation of wetland ecosystem is necessary while discussing development plan in this area.

(4) Impacts caused by acid soil

As mentioned above, two types of soil, namely the peat soil and the alluvial soil, exist in swamp area under study. The peat soil is potential sulfate acid soil which often indicate below pH 3 in dry condition.

(Impact to agriculture)

The rice harvest is affected heavily by the acid soil causing low productivity. The low productivity has been accelerated by illegal forest cutting done by farmers who try to obtain more cash income.

(Impact to inland fisheries)

During one third of a month, the typical farmers in this area are engaged with fishery. The decrease of water quality caused by acid soil has affected to not only the quality of drinking water for people's dairy life but also ecosystem for fish resulting in decrease of fish population. Generally, the fish catch is high in dry season. However, the fish catch decreases in dry season because the water is affected by acid due to the dryer soil resulting higher acid concentration. Basically, the farmers who have large portion of fisheries are poor and the fish is important for not only getting cash income but also obtaining valuable protein sources for themselves.

While Indonesian Government focuses on the swamp area to develop agriculture, farmers in the area face the problems such as poor productivity and limitation of possible crops cultivated in the area.. Consequently the farmers' living condition is relatively low compared with in other provinces.

Based on the results of field survey the following constraints were clarified.

(1) Constraints of natural condition

a. Flood and saline water

The farmland in the study area is either flooded or wetted through all the seasons due to its poor drainage condition. This forces farmers to have limited choice of crops for cultivation. Besides, since most of the land located in tidal swamp area is influenced by the water level of the river, it is difficult to drain water when the field is flooded. That causes the farmers a large much burden of field management. Besides, coastal swamp area contains saline water and it causes stress to the growing crops.

b. Soil condition

As mentioned above most of soil in the area are peat or alluvial soil which accumulated with coastal plants or sediments in the sea. Due to the high contents of sulfate acid and potential sulfate acid in soil, acidity of soil shows around pH 4~5. Besides when surface water is scarce, sulfate acid can not be removed with water and potential sulfate acid (pyrite) is activated. Consequently, soil acidity raises to extremely high level causing severe damage to rice. Also, shortage of mineral and existence of toxic substance (Fe) in soil becomes common problem in this area.

(2) Social and economic constraints

a. Labor

Population density in the province is 69 persons/km². Compared to the national average of 93 persons / km², this figure shows that there is a shortage of labor population needed for agricultural development. On the farmers level, since their work relies on the traditional tools, their labor productivity is poor. Most of farmers who cultivate more than one ha of rice need to hire labor during tilling, transplanting, harvest and post-harvest work.

b. Characteristic of local people

As mentioned in agricultural condition, most of the farmers are engaged in fishery together with rice cultivation and more than half of farm households do not have their own land. With this circumstance, many local people do not pay

much attention to their land and do not have the sense of uniting themselves.

c. Finance

Most of farmers lack the finance to get agricultural materials and equipment. Current finance system operated by BUD or KUD is not useful for them because the troublesome procedure and also they lack the consciousness of payment of interest.

(3) Technical constraints

a. Infrastructure

Constraints on infrastructure are following ;

- Most of irrigation and drainage system do not have a good circulation, so that the leaching process is not functioned.
- Decrease in canal capacities is due to sedimentation and grass growth
- Most of water control structure do not work well or are broken due to the poor maintenance and shortage of water management skill.
- Lack of farm roads
- Lack of supply of water and electricity

b. Post-harvest management

As one of the constraints on extension of double cropping of rice, farmers are forced to harvest in rainy season in the first cropping. This often causes both quantity and quality losses mainly due to the difficulty of drying the harvests.

c. Rat control

Rats often cause serious damage to the harvests in the study area. Though integrated rat control is established through technical assistance of JICA, the problem still remain unsolved in most part of the area. Cooperative control in the regional level is required.

D.4.2 Proposed Basic Development Concept

Until now, agricultural development in this area is mainly focused on land reclamation and improvement of the infrastructure including irrigation, drainage and farm roads without giving much consideration to environment. As a result, land sedimentation and soil acidity became serious problems. Also, agricultural technology was left behind.

On the other hand as mentioned in item D.4.1, much development needs and constraints exist in the area. Therefore it can be said that implementation of simple project does not necessarily contribute to increase in farmers' income.

It is important to achieve the integrated agriculture and rural development in consideration of environmental aspects.

D.4.3 Required Actions for the Proposed Development Concept

From the viewpoint mentioned above, the following projects are proposed:

(1) Study for integrated agricultural and rural development in swamp area

This study aims to provide a master plan which clarifies the directions of agricultural and rural development in swamp area.

Barito river basin which has large typical swamp with potential for agricultural development could be suggested as a study area.

(2) Improvement of the capability of the research institute

As mentioned in item D.2.3, RIFSA conducts research activities necessary for the development of agricultural technology in swamp area.

On the other hand, Ministry of public work plans to establish the research institute in a viewpoint of the following engineering aspect.

- Improvement of irrigation and drainage system
- Improvement of structure technology on soft ground
- Improvement of rural infrastructure

Therefore it is necessary to improve their research activities together with strengthening the relationship between the two institutes to support the development of agricultural technology. Especially, the following research activities shall be focused to deal with current major problems in the study area.

- Improvement of irrigation and drainage system
- Development of crop varieties more appropriate and suitable to local condition
- Soil analysis and management
- Post-harvest technology
- Appropriate technology for farm mechanization
- Diversification of agricultural management by combining cash crop, livestock

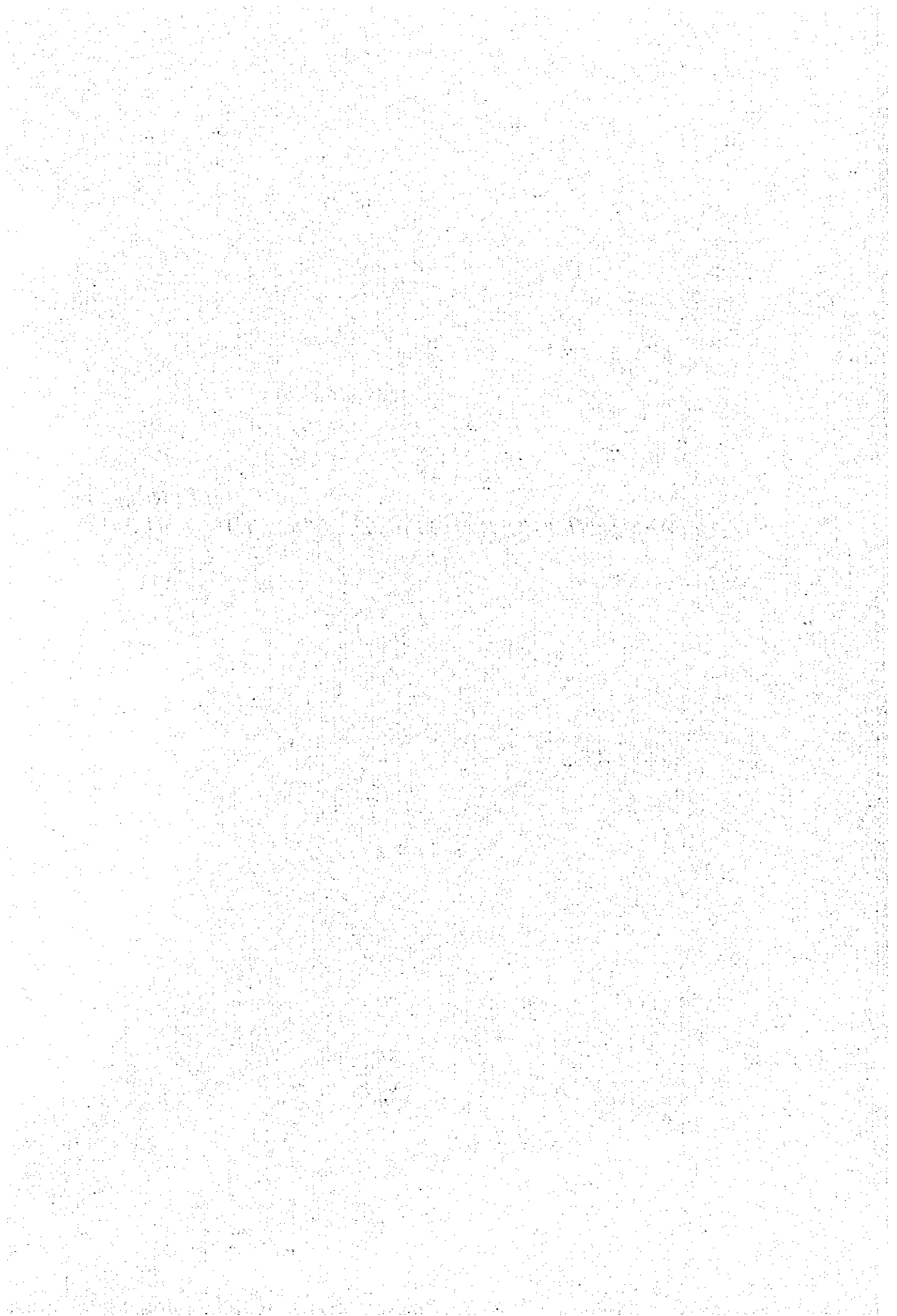
and fishery

(3) Improvement of agricultural extension system

Agricultural extension system shall be improved to develop appropriate agricultural technology on farmers' level in cooperation with above mentioned research activities

Strengthening the activities of BLPP which holds key position in extension of agricultural technology is important and also it should be the main executing agency to implement the project.

APPENDIX E:
FARM HOUSEHOLD AND FARMERS* INTENTION SURVEY



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APPENDIX E : FARM HOUSEHOLD AND FARMERS' INTENTION SURVEY

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APPENDIX E : FARM HOUSEHOLD AND FARMERS' INTENTION SURVEY

E.1 Objectives of the Survey

This study, "Farm Household and Farmers' Intention Survey" was conducted with the objectives of comprehending the present conditions of the followings aspects in each study area:

(1) The Economic Conditions of Individual Farm Household

The data concerning the agricultural productivity and living standard of farmers were collected. These data include a part of the base line data and it shall be utilized for evaluation and monitoring of the Third Umbrella Cooperation Program.

(2) The Farmers' Intention for Development

The information concerning the problems which farmers are facing and their intention for further development was collected. This information shall be analyzed for determining the directions of development in the Cooperation.

(3) The Socioeconomic Conditions of Villages

The general data including the agricultural productivity and brief description of socioeconomic conditions of villages was collected. The data includes a part of the base line data and it shall be utilized as a supplement information to understand the condition of individual farm households.

E.2 Contents of the Survey

In order to collect sufficient data to comprehend the economic conditions of individual farm household and farmers' intention for development, the questionnaire "Form-A" covering the following categories was prepared:

- | | | |
|-------------------------------------|------------------------|-------------------------------------|
| 1) Family | 2) Living Condition | 3) Cultivating Land Area |
| 4) Cultivation, Yield and Marketing | 5) Infrastructure | 6) Agricultural Equipment and Tools |
| 7) Agricultural Facility | 8) Labor | 9) Income |
| 10) Expenditure | 11) Farmers' Intention | |

Also, for surveying the socioeconomic conditions of villages, the questionnaire "Form B" was prepared in order to collect village level information.

The contents of these questionnaire were reviewed by the Indonesian counterparts and were finalized in Jakarta before field investigation was conducted in the targeted regions. The questionnaire format prepared for this survey is shown in the ATTACHMENT E1. of this APPENDIX E.

E.3 Procedure of the Survey

(1) Method of data collection

In order to collect reliable information in limited time, the extension officer (PPL) who knows the people and the conditions in each village very well, were nominated as surveyors. Also, subject mater specialist (PPS) and sub-district agriculture officer (Mantan) were instructed to support the extension workers in this survey. The structure of survey is shown in figure E.3.1.

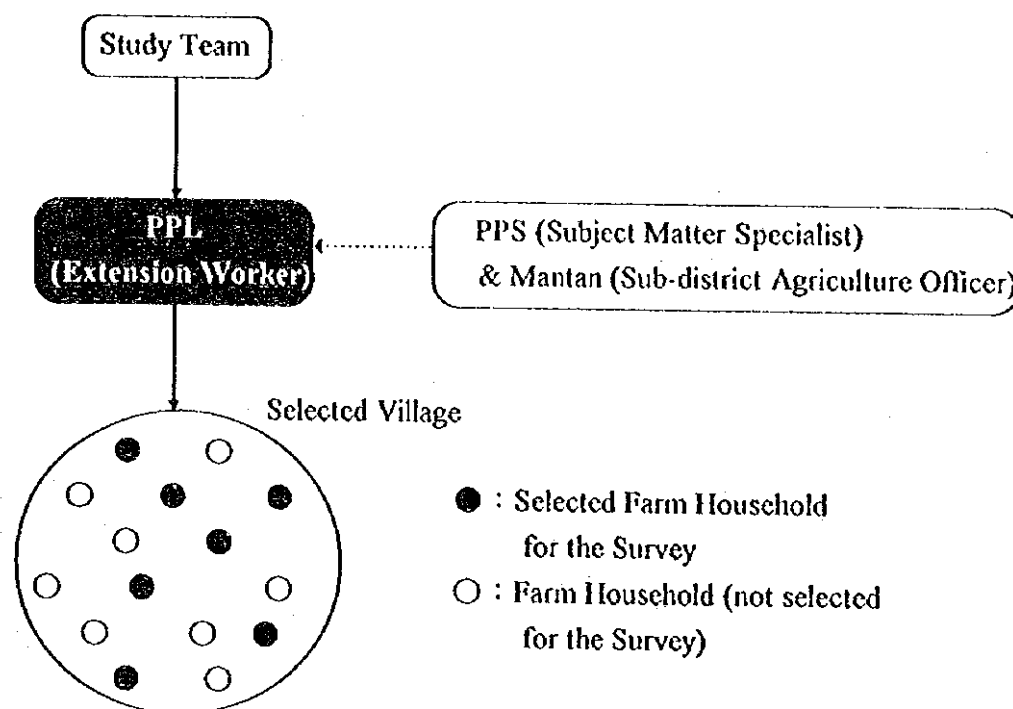


Figure E.3.1 Structure of Farm Household and Farmer's intention Survey

Data and information for (1) and (2) in the previous section E.1 were collected from individual farmers directly by hearing, in accordance with the questionnaire. Data and information for (3) were collected from head of village and/or sub-district agriculture officer.

(2) Scale of the survey

200 households (20 households/each area x 10 areas) were selected in each model area. Since this survey covers four model areas, the total number of the sample was 800 households.

(3) Selection of sample

Since the number of sample are limited in each area, village (desa) which is the smallest administrative unit where reliable data of farmers are compiled and readily available, was defined as a sample area for this survey. Through the discussions between the Japanese study team and provincial level officers of the Government of Indonesia , 10 villages for each model area were selected . The concept of agro-ecosystem and the objectives of the development were considered in the selection process.

Then, the surveyors (PPL) were instructed to categorize the farmers in each village into three to four groups according to the magnitude of individual farmer's operation. Finally, a total of 20 farmers were selected from each category group for individual interview.

(4) Technical Transfer

To ensure the accuracy of collected data, the member of the Study Team transferred their skills and knowledge of data collection to the extension officers through series of discussions and instructions. It is believed that transfer above kills and knowledge to regional level extension officers not only facilitates higher accuracy of data but also strengthens the organization structure of monitoring and evaluation that shall be necessary for this cooperation in future.

(5) Results of data collection

For this survey, a total of 800 copies of questionnaire "Form A" and 40 copies of questionnaire "Form B" were printed and distributed to each surveyor. By March 15, 1996 at the completion of survey all the answered questionnaire were collected. Consequently, the collection rate of questionnaire for this survey was 100%.

E.4 List of Selected Villages

The list of selected villages in each province for the survey is given in Table E.4.1:

Table E.4.1 List of Selected Villages

Province	District	Sub-district	Village (Desa)	Village No.	No. of Farmer
1) South Sulawesi	Pinrang	Watang Sawito	Benteng	S01	20
			Mattirodeceng	S02	20
		Mattiro Sompe	Mattiongeng	S03	20
		Cempa	Maltunru tunru	S04	20
		Duampanua	Tatae	S05	20
	Sidrap	Duapitue	Tanrutedong	S06	20
			Ajubissue	S07	20
		Marutengnagae	Empagae	S08	20
			Kanyuara	S09	20
			Lautang Benteng	S10	20
2) West Java	Kuningan	Cigugur	Ci Santana	J01	20
		Danna	Sagarahiang	J02	20
	Bandung	Pasir Jambu	Tenjolaya	J03	20
		Ciwidey	Lebak Muncang	J04	20
			Alam Endah	J05	20
	Cianjur	Sukaresmi	Cikanyere	J06	20
		Pacet	Cipandawa	J07	20
			Cibodas	J08	20
	Sukabumi	Sukaraja	Langensari	J09	20
			Sukamaju	J10	20
3) West Nusa Tenggara	Sumbawa	Lape/Lopak	Lape	N01	20
			Lopak	N02	20
		Plampang	Labangka II	N03	20
			Labangka IV	N04	20
	East Lombok	Pringgabaya	Pringgabaya	N05	20
			Swela	N06	20
		Keruak	Jerowaru	N07	20
			Pemonkong	N08	20
	Central Lombok	Pujut	Rembitan	N09	20
			Truwai	N10	20
4) South Kalimantan	Tapin	Bakarang	Parigi Kercil	K01	20
		Candi Laras Selatan	Maranpiaw	K02	20
		Binuang	Pantai Belanti	K03	20
	Banjar	Martapura	Panggalaman	K04	20
		Sungai Tabuk	Sungai Lulut	K05	20
		Gambut	Guntung Utung	K06	20
	Barito Kuara	Mandastana	Karang Indah	K07	20
			Karang Bunga	K08	20
		Tabunganen	Beringin Kencana	K09	20
			Tanggul Rejo	K10	20
				Total No.	800

The location of these selected villages in each province is shown in the ATTACHMENT E2. of this APPENDIX E.

E.5 Processing of Survey Data

A data base consisting of all information contained in the answered questionnaire was created using the computer software "Microsoft Excel". Then, each data was combined and processed to obtain figures displaying the characteristics of each provinces. Some of these figures were transformed into graphical display for easy comprehension. All data collected for this survey are available for further processing and analysis. The summarized results of this survey is shown in the ATTACHMENT E3. of this APPENDIX E.:

Attachment E.1 Questionnaire Format

The government of Indonesia decided to conduct a survey to make the program for improving of farmers' living condition with the assistance of Japanese government.

This survey aims to collect basic data necessary for making the program and evaluation.

We would appreciate it very much if you understand the purpose and cooperate with us. Since the survey result will be analyzed statistical, we will never cause you any troubles.

Province number :		1. South Sulawesi	2. West Java	3. West Nusa Tenggara
		4. South Kalimantan		
District number (01 ~ 10) :		No. _____		
Sample number (01 ~ 20) :		No. _____		
Name of Village:				
Name:		(Age)		
Category(*):				

* Write the category of grouping of farmers in the village. The categories shall be determined for each village when selecting farmers for interview.

Name of Surveyor (PPL) :
Date of Survey :
Place of Survey :

▪ Socio economic survey on the farm household

1. Family

1-1 How many people in your family? _____ persons (Men ____ + Women ____)

1-2 How many people working for the farming in your family?

1. Full time for farming / only farming * _____ persons

2. Part time for farming / farming and other jobs ** _____ persons

3. Not participated / only other jobs _____ persons

Remarks : * "only farming" includes the on-farm works for other farmers on wage basis.

** "other jobs" includes the seasonal employment and self-employment on non-agricultural works. And total working days on that jobs shall be maximum around 60 days in a year.

** Not include children even if he/she is engaged with part time on-farm works.

2 Living condition

2-1 Do you have(use) electricity in your house? (select one answer) : a. yes b. No

2-2 How do you get water for house use? (select one answer) :

- a. Well b. Well (with hand pump) c. Well (with power pump) d. River
e. Rain (with water catchment) f. Tap water (public water supply)

2-3 What kind of power source do you use for cooking? (select one answer)

- a. wood, charcoal b. kerosene c. gas (LPG) d. electric
e. Other (describe in brief _____)

2-4 How often do you have(eat) meat?(select one answer)

- a. 1 - 2 times in a month (eat seldom)
b. 1 - 2 times in a week (eat sometimes)
c. 3 - 4 times in a week (eat every other day)
d. 5 - 7 times in a week (eat almost every day)

2-5 Type of house (select one answer)

- a. Permanent type (brick wall, ceramic roof, cement floor)
b. Semi-permanent type (wood wall, ceramic roof, cement floor or ground)
c. Temporary type (any type other than a. & b.)

2-6 Do you have the goods mentioned below?(select all you have)

a.Motorbike

b.Car (1-wheel & 3 wheel)

c.Television

d.Refrigerator

3. Cultivating Land Area

3-1 Tell me the farming land area which being cultivated and managed by your family.

1. Paddy field _____ ha (Numbers of plots: _____plots)

2. Upland field _____ ha (Numbers of plots: _____plots)

3. Orchard and other perennial crops _____ ha (Numbers of plots: _____plots)

Remark ; Don't include the owned land which is rent / leased to other farmer(s).

4. Cultivation, Yield and Marketing

Questions for Crops

Remark : Answers are filled in the Form A attached.

4-1 What kind of crops do you grow in the each field which mentioned above question 3-1.

Tell me the name of crops only which you grow for sale.

4-2 to 4-5

Please answer the following questions on each crops, but only for the major crops, listed in 4-1 which you grow for sale.

4-2 Total Harvested Area in one year (12 months)(in several planting seasons)

4-3 Total Harvested Amount in one year (12 months)(in several planting seasons)

Remarks; 1) Rice = dried weight with husk

2) Corn = dried weight without comb

3) Pulses = dried weight without pod

4) Ground peanut = dried weight with pod

4-4 Total Sales Amount in one year (12 months)(in several planting seasons)

4-5 On Farm Processing : Do you process the farm produce by yourself ?

Questions for Animals

Remark : Answers are filled in the Form B attached.

4-6 What kind of animals do you grow?

Tell me the name of animals only which you grown for sale.

4-7 to 4-9

Please answer the following questions on each animals listed 4-6.

- 4-7 Numbers of animals at present
- 4-8 Total number of animals sold in one year (12 months)
- 4-9 Total Sales Amount in one year (12 months)

5. Infrastructure

Please answer the questions 5-1 and 5-2 regarding the farm plots which is cultivated & managed by your family.

5-1 Do you have the access road to your plots which has enough width for hand-tractor (min. 1.5 m in width:select one answer)

- a. Yes, there are roads to all plots
- b. There are roads to some plots
- c. No, there is no access road at all.

5-2 Do you have enough irrigation water for farming in your field? (select one answer)

- a. Enough supply in both dry and rainy season
- b. Enough supply in rainy season but not enough in dry season
- c. Not enough supply in neither rainy nor dry season

6. Agricultural Equipment & Tools

6-1 What kind of equipment do you have ? Select all you have from below:

- | | | |
|----------------------------|-----------------------------|--|
| a. Portable water pump | b. Hose pipe for irrigation | c. 4-wheel tractor |
| d. 2-wheel hand tractor | e. Manual hand sprayer | f. Power sprayer |
| g. Reaper | h. Thresher | i. Winnow |
| j. water mill | k. Cart ,Cattle wagon | l. 2-wheel hand tractor +Trailer |
| m. Truck(3-wheel, 4-wheel) | n. Grass cutter for weeding | o. Durable container for handling of produce |

7. Agricultural Facility

7-1 What kind of facility for animals do you have? (select all you have)

- a. I have no facility
- b. Hut for animals
- c. Storage for fodder, feed
- d. Other (describe in brief _____)

Remark : Answer questions 7-2 to 7-4 if you have any facility for animals.

7-2 What kind of animals do you have with the facility ? (select all applicable)

- a. Cattle for Milk
- b. Cattle for Meat
- c. Pig
- d. Hens for egg
- e. Hens for Meat (broiler)
- f. Goats, sheep
- g. Other animal (describe name of animal: _____)

7-3 Size of the hut : _____ m² and _____ nos. of hut

7-4 Capacity of the Storage: _____ ton and _____ m³

7-5 Do you have ware-house for keeping crops and equipment ? (select one)

- a. Yes, I have
- b. No, I don't have

Remark : Answer questions 7-6 if you have ware-house

7-6 Size of the ware-house: _____ m²

8. Labour

Please answer the questions 8-1 to 8-3 regarding the field which your family cultivate & manag.

8-1 Do you use wage workers (labors paid with money and/or produce)

- a. Yes
- b. No

8-2 Is it difficult to find workers ?

- a. easy
- b. sometime difficult
- c. always difficult

8-3 What are your objectives of using workers ?

- a. Tilling
- b. Transplanting
- c. Weeding
- d. Disease/insect control
- e. Harvesting
- f. Threshing, cleaning & selecting
- g. Nursing
- h. Transportation / Sales
- i. Others (describe in brief _____)

9. Income

Please show in the box below the total family income in one year (in last year) with the following 3 categories.

9-1 How much income did your family get last year by selling the various agricultural produces?

Remark: agricultural produce = produced by your family + produce obtained as a land lease fee

9-2 Excluding 9-1 (income from agricultural produce), how much income did your family get last year from agricultural related income source; i.e. land lease fee, machinery lease fee and wages.

Remark: wage income = money obtained by participating agricultural activities; i.e. weeding, harvesting.

9-3 How much income did your family get last year from the other jobs ; i.e. kiosk, driver, carpenter and etc.

9-1	Rp.
9-2	Rp.
9-3	Rp.
Total	Rp.

10. Expenditure

Please show in the box below the total family expenditure in one year (in last year) with 2 categories mentioned below.

10-1 How much is the total expenditure relating to the agriculture production ?; i.e. fertilizer, chemicals, seed, transportation fee, water fee, land lease fee, labour wage and etc.

10-2 How much is the total expenditure for living ?; i.e. food, cloth, house, education, hospital, marriage ceremony and etc.

10-1	Rp.
10-2	Rp.
Total	Rp.

4-1 Kind of Crop	4-2 Harvested Area (ha)	4-3 Harvested Amount (kg)	4-4 Sales Amount (kg)	4-5 On farm Processing	
				Yes	No

4-6 Kind of Animal	4-7 Number of Animals at present	4-8 Number of Sold Animals	4-9 Sales Amount (Rp.)
1. Cattle (milk)			
2. Cattle (meat, work)			
3. Pig			
4. Goat, sheep			
5. Hens (meat)			
6. Hens (egg)			
7. Other poultry			
8. Fresh water fish			

Survey on the intention of farm management

1. What is your major problems for growing crops and feeding animals ?

(Choose 1 to 3 answers from the following)

- a. Poor soil fertility
- b. Irrigation water (shortage, flood, etc.)
- c. Damage by insect, disease, rodent, bird, animals
- d. High production cost (seed, fertilizer, water fee, feed, etc.)
- e. Low quality seed, difficult to obtain good seed
- f. Other problems caused by natural conditions in the region
- g. I do not know what is my problem / I think there is no problem

2. What is your major problems for marketing your farm produce ?

(Choose 1 to 3 answers from the following)

- a. Low selling price
- b. Quality doesn't meet market requirement and can't sell all the produce
- c. No transportation to the market or collection point
- d. Middle-man (broker, wholesaler) who has capital keep the selling price low.
- e. Unable to do the proper treatment before selling (treatment = drying, cleaning, grading, sorting, pa
- f. Deterioration and/or Damage by insect/disease/animal after harvesting
- g. Seasonal fluctuation of selling price (unstable selling price)
- h. I don't know what is my problem / I think there is no problem

3. Do you want to increase your farm income? If yes, what is your idea for increasing your income ?

(Choose 1 to 2 answers from the following)

- a. I am satisfied with the present income level
- b. I want to expand / enlarge farming scale → Go to 3-1, 3-2, 3-3
- c. I want to introduce new crops / animals → Go to 3-2, 3-3
- d. I want to change marketing method → Go to 3-4
- e. I want to add value to produce by processing
- f. I want to increase my income, but I have no idea how to do that.

3-1 How do you want to expand / enlarge your farming scale ? (Choose only one answer from the followi

- a. Purchase the land
- b. Lease the land
- c. Cooperate with other farmer(s) / cooperative
- d. Other ()

3-2 What kind of crop / animal do you want to introduce ? (Choose 1 to 3 answers from the following)

- | | | | |
|-----------------|-----------------------------|--------------|----------------|
| a. Rice | b. Palawija | c. Vegetable | d. Fruit |
| e. Pig | f. Sheep, goat | g. Poultry | h. Cattle/milk |
| i. Cattle/meat | j. Flower, ornamental plant | | k. Fish |
| l. Estate crops | m. Others (describe name : | | |

3-3 What would be your problem or your concern, if you expand the farm scale or introduce the new crop / animal ? (Choose only one answer from the following)

- | | | |
|------------|-------------------------------------|----------------------------|
| a. Capital | b. Skill / technique for production | c. Marketing of production |
| d. Other (| |) |

3-4 How do you want to change your marketing of your produce ? (Choose 1 to 2 answers from the follow

- | | |
|---|------------------------------------|
| a. Sell to consumers directly at market | b. Sell to intermediates at farm |
| c. Sell to whole seller / retailer directly at market | d. Sell to the processors directly |
| e. Cooperative or cooperate with other farmers | |
| f. Others (|) |

4. In case of improving conditions of your farm field, what do you do to improve ?

(Choose 1 to 2 answers from the following)

- | | |
|----------------------------------|---------------------------|
| a. Improve/make access road | b. Make irrigation canal |
| c. Rehabilitate irrigation canal | d. Improve drainage |
| e. Install irrigation pump | f. Enlarge / expand field |
| g. Others (describe : |) |

5. In case of using agricultural machine / equipment, what kinds of machine / equipment do you want to use or for what practices do you want to use ? (Choose 1 to 2 answers from the following)

- | | | | |
|-------------------------------|------------------|-------------------|--------------|
| a. Tilling | b. Transplanting | c. Harvesting | d. Threshing |
| e. Drying | f. Transporting | g. Feeding animal | h. Milking |
| i. Others (describe in brief: | | |) |

6-1 Do you know about the Official Credit Service ? (Choose one answer)

- a. No, I don't know.
- b. Yes, I know. → Go to 6-2

6-2 Have you ever gotten the loan from the Official Credit Service ? (Choose one answer)

- a. No → Go to 6-3 : ask question " Why you don't use the Official Credit Service"
- b. Yes → Go to 6-3

6-3 What is your request for the official credit service? (Choose 1 to 2 answers from the following)

- a. Raise limitation of debt amount
- b. Lower interest
- c. Extend term
- d. Simplify application procedure
- e. Place bank/institute more closer to village
- f. No opinion
- g. No request, being satisfied with the present service

7. What do you request to the agricultural extension services? (Choose 1 to 2 answers from the following)

- a. No request
- b. Intensify the door to door technical service (visit more frequently)
- c. Improve the skill / knowledge of extension worker
- d. Supply of information related to cropping (new variety, market trend)
- e. Teach about the know-how of farm management / operation
- f. Supply of market price information
- g. Teach about the official credit service
- h. Increase the variety of demonstration plots (i.e: mechanization, vegetable growing, estate crops, etc.)
- i. Others (describe in brief:)

The government of Indonesia decided to conduct a survey to make the program for improving of farmers' living condition with the assistance of Japanese government.

This survey aims to collect basic data necessary for making the program and evaluation.

We would appreciate it very much if you understand the purpose and cooperate with us.

Province number : 1. South Sulawesi 2. West Java
 3. West Nusa Tenggara 4. South Kalimantan

District number (0 1 ~ 1 0) : No. _____

Name of Village:

Name of Surveyor (PPL / Mantan) :

Date of completing collection :

Umbrella Survey / FORM B

Final

Village Data
Form 1 Access to major city

Name of city	Road condition	Common methods of transportation	Distance (km)	Time required
Provincial Capital	Paved / Unpaved	Vehicles / boat /on foot / other		
District Capital	Paved / Unpaved	Vehicles / boat /on foot / other		
Sub-district Capital	Paved / Unpaved	Vehicles / boat /on foot / other		
	Paved / Unpaved	Vehicles / boat /on foot / other		

Form 2 Population, Number of households, Structure of family

Total Village Population		
Population by Sex	Men	Women
Population by Employment		
Agriculture		
Public Service Officer / Teacher		
Trading / Service		
Industry		
Total number of households		
Number of farm households		
Number of non-farm households		
Average number of standard family member		

Form 3 Existence / condition of agricultural facilities

Facility	The object crop / animal	Existence	Ownership / Management	Capacity / Size
Irrigation		Exist / Not exist	Community / Cooperatives / Personal / company / other	
Threshing		Exist / Not exist	Community / Cooperatives / Personal / company / other	
Drying		Exist / Not exist	Community / Cooperatives / Personal / company / other	
Storing		Exist / Not	Community / Cooperatives / Personal / company /	

Umbrella Survey / FORM B

Final				
		exist	other	
Rice milling		Exist / Not exist	Community / Cooperatives / Personal / company / other	
Processing		Exist / Not exist	Community / Cooperatives / Personal / company / other	
Collection / Shipping		Exist / Not exist	Community / Cooperatives / Personal / company / other	
Warehouse		Exist / Not exist	Community / Cooperatives / Personal / company / other	
		Exist / Not exist	Community / Cooperatives / Personal / company / other	

Form 4 Land area by use / classification

use / classification	Area (ha)
Total Village Area	
Lowland (paddy) field	
Upland field	
Orchard and other perennial crop land	
Swamp area	
Others	

Form 5 Production / planted area / yield of main crops

Crop	Production		Planted Area		Yield	
	Dry season	Rainy season	Dry	Rainy	Dry	Rainy
Rice						
Palawija						
Potato						
Pulses						
Corn						
Vegetable						
Fruit						

Form 6 Typical cropping pattern

Umbrella Survey / FORM B

Month	Final											
	1	2	3	4	5	6	7	8	9	10	11	12
Name of crop												

Sowing $\Delta \cdots \Delta$ Harvest -----

Form 7 Sales channels of main agricultural products

The name of products	Channel
(Example)	Farmer → Middle man in village → Wholesaler in the market

Form 8 Scale of land and farmers' category

Farmers' category	Number of farm households
Landowner (no farming)	
Owner farmer	
Tenant farmer	
Employed (Salaried) farmer	

Umbrella Survey / FORM B

Final

Form 9 Farmers' organization and cooperative union

Name of Organization / Cooperative union	Members' number (No. of farm households)	Objective / activity	Objected crops
Farmer's Group			
Lady's Group			
Youth Group			
Agricultural Cooperative			
Other			

Form 10 Employment and standard wage excluding agriculture

Employment	Standard Wage (Rp.)
Public Service Officer	
Teacher	
Carpenter, Driver	
Middle man in the community	
Labor	

Form 11 Number of Domestic Animal / Livestock

Animal / Livestock	Number
Cattle (for milk)	
Cattle (for meat)	
Buffalo	
Goat, Sheep	
Domestic chicken, duck	
Broiler	

Form 12 Facility / Institute in Village

Facility / Institute	Exist or Not exist	Ownership (Gov. or Private)
for Education	Exist / Not exist	Gov. / Private
Corporation	Exist / Not exist	Gov. / Private
Bank	Exist / Not exist	Gov. / Private
Credit	Exist / Not exist	Gov. / Private
Other	Exist / Not exist	Gov. / Private

Umbrella Survey / FORM B

Final

Form 13

Is your village involved in the IDT Plan ?

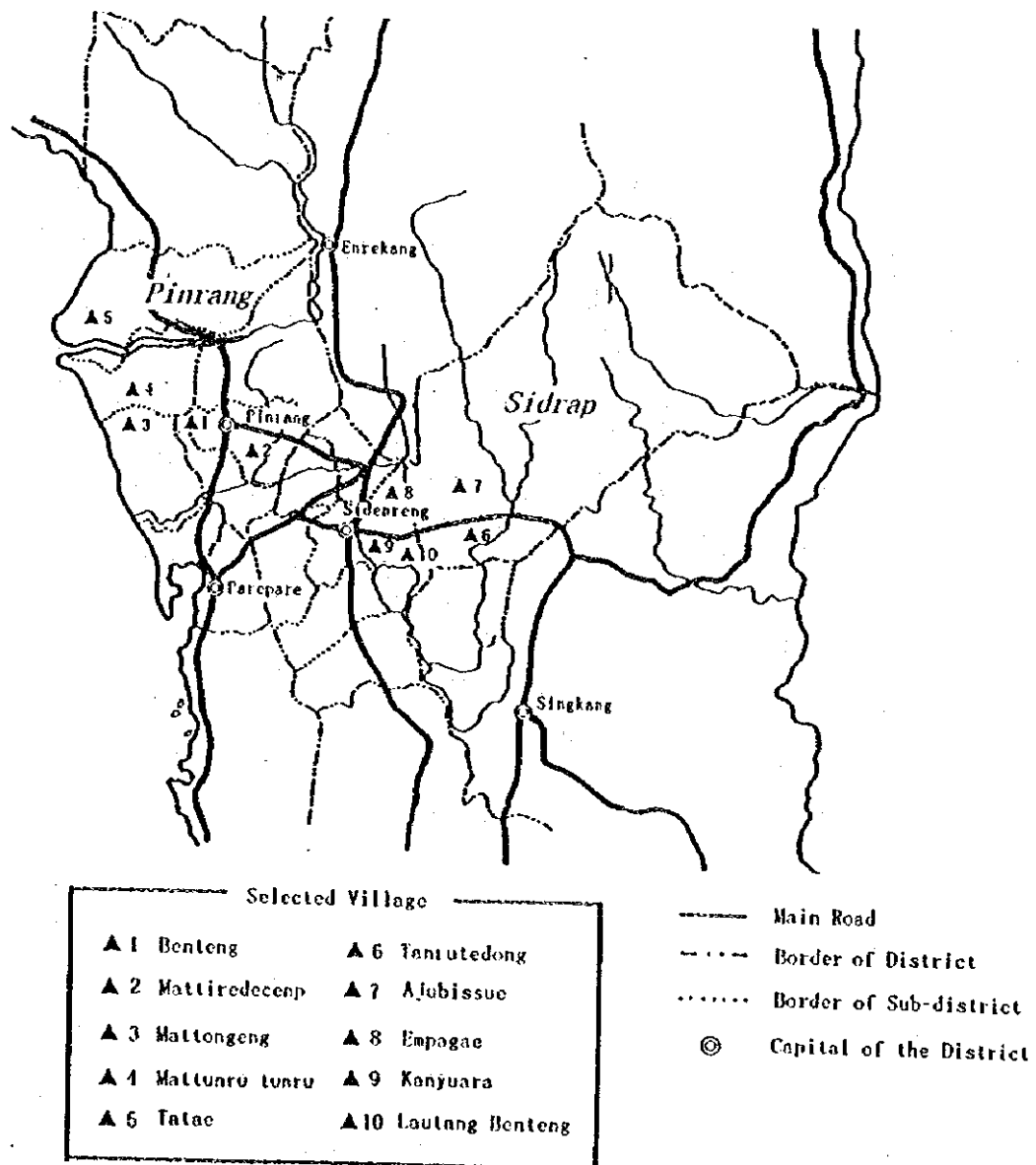
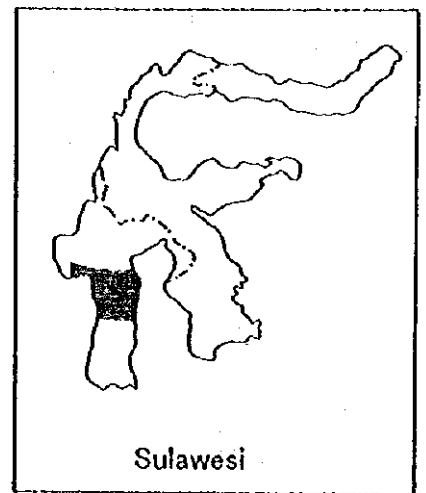
If yes, (1) explain the reason of the involvement and (2) specify the object of the plan.

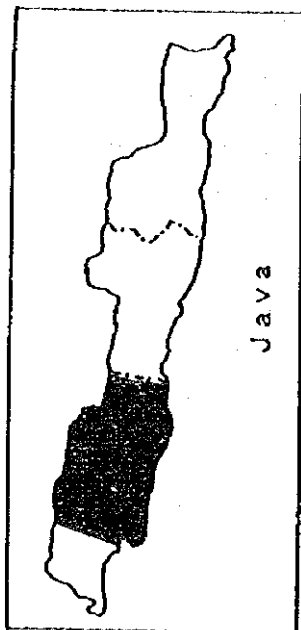
(1)

(2)

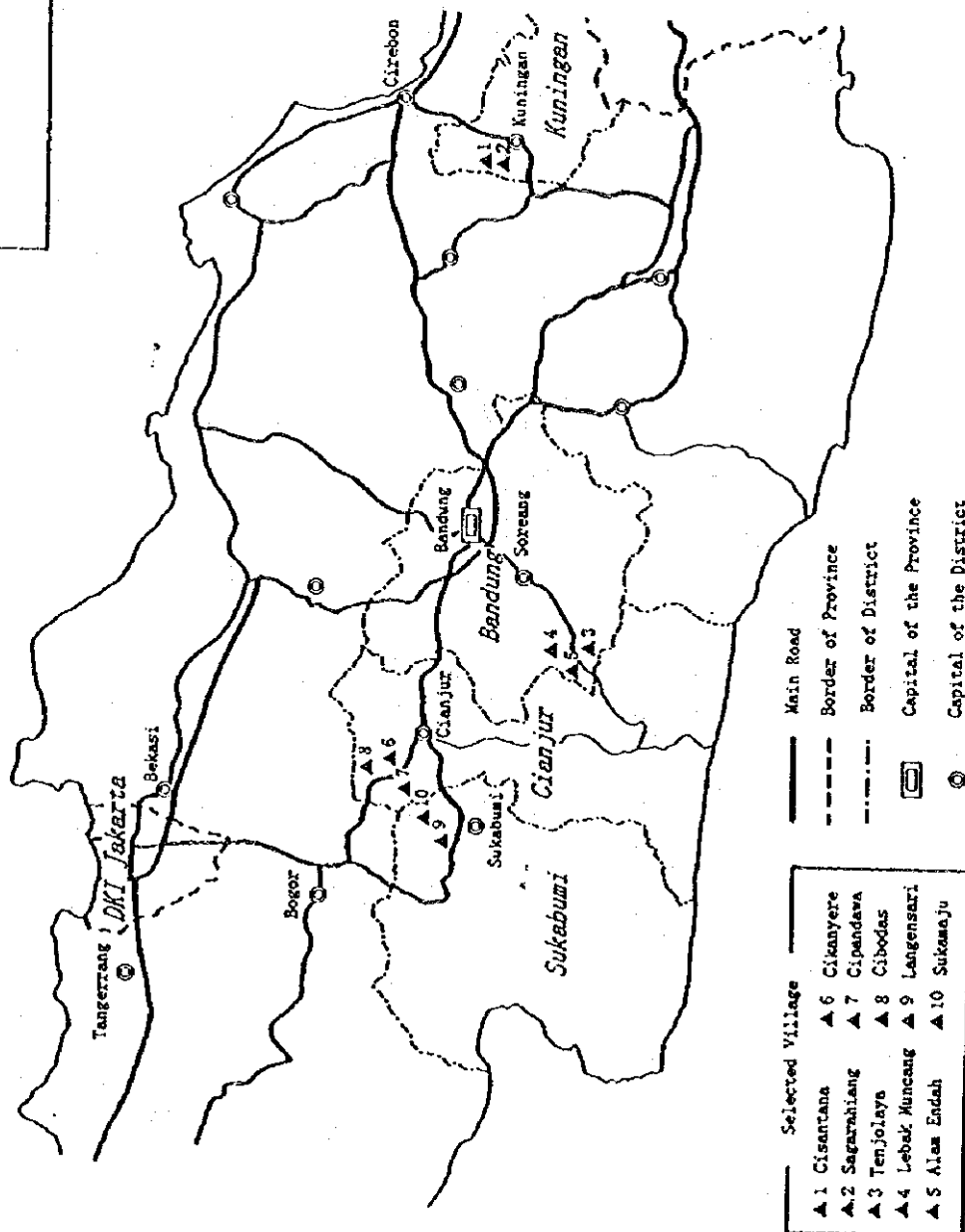
Attachment E.2 Location Map of Selected Villages

Location Map of Selected Village
(1/4 South Sulawesi)

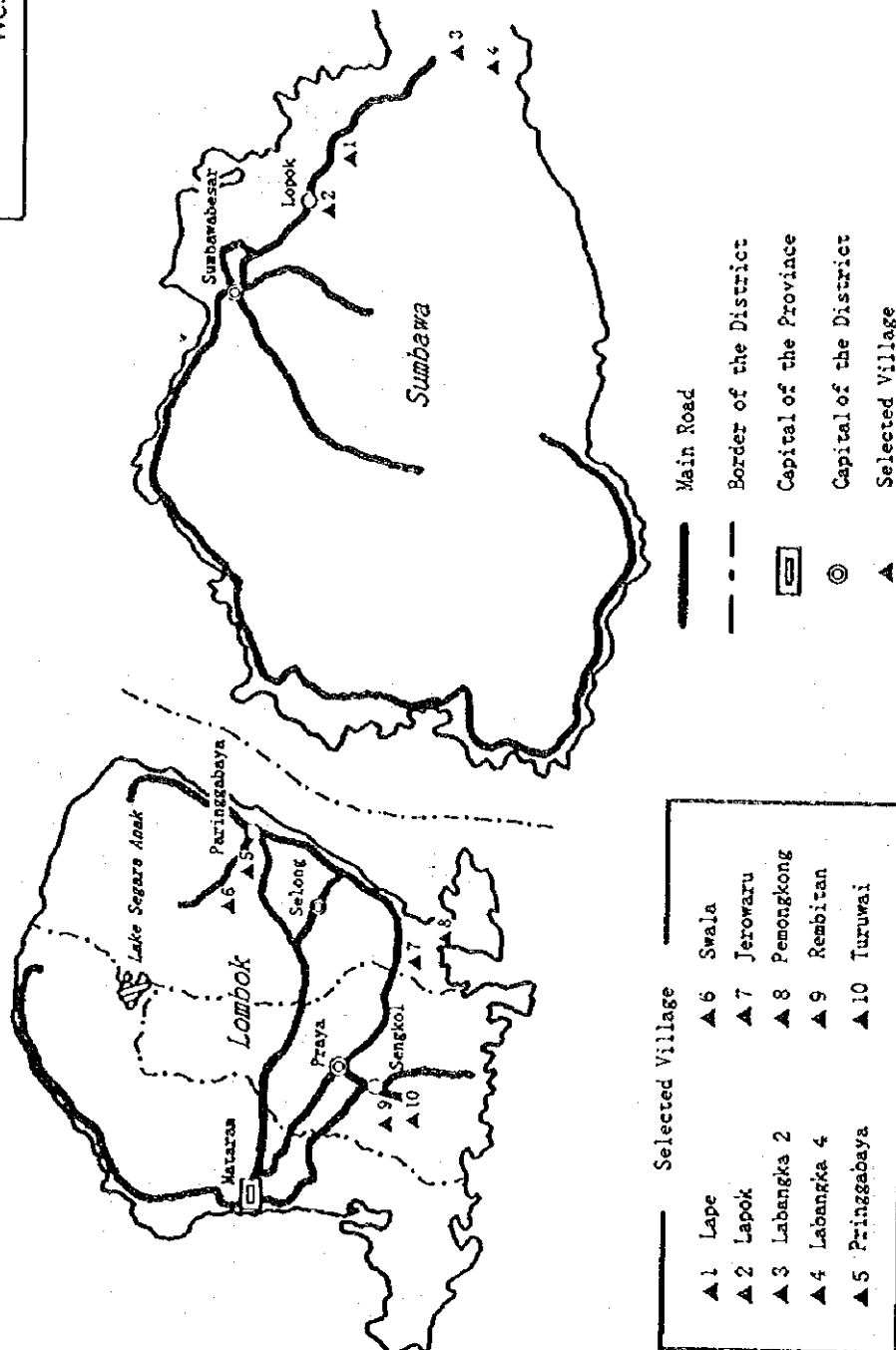
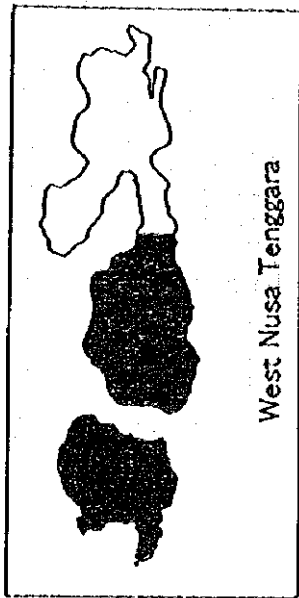


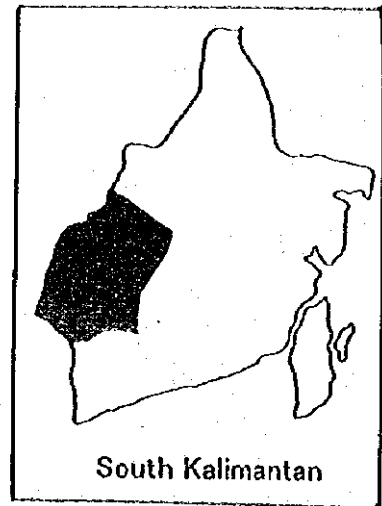


Location Map of Selected Village
(2/4 West Java)

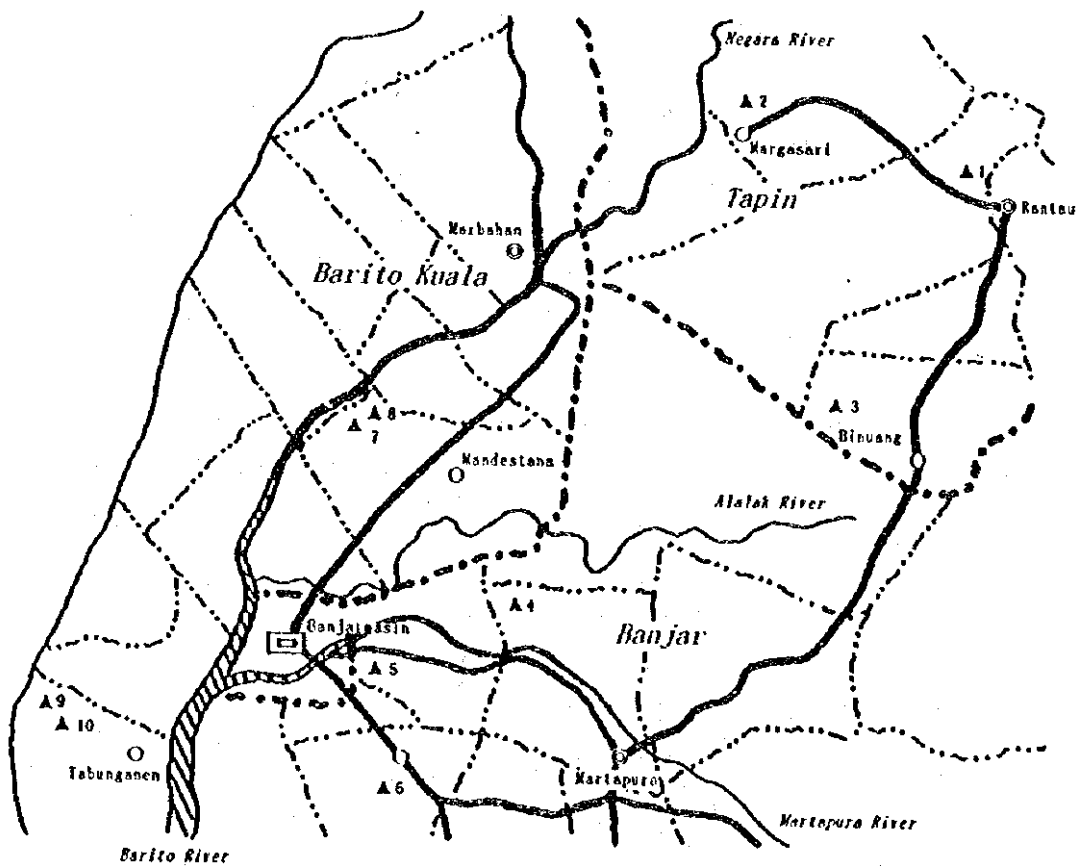


Location Map of Selected Village
(3/4 West Nusa Tenggara)





Location Map of Selected Village
(4/4 South Kalimantan)



Selected Village	
A 1 Parigi Kercil	A 6 Cuntung Ujung
A 2 Morampiau	A 7 Kalang Indah
A 3 Pantai Belanti	A 8 Kalang Bunga
A 4 Panggalaman	A 9 Deringin Kencana
A 5 Sungai Lulut	A 10 Tanggul Rejo

- Main Road
- Border of District
- Border of Sub-district
- Capital of the Province
- Capital of the District

Attachment E.3 Results of Survey

(1) South Sulawesi

LIVING CONDITIONS

Province No.

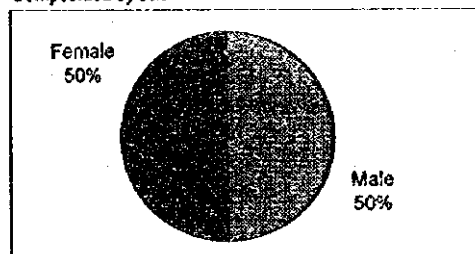
1

Q1-1 Family Component

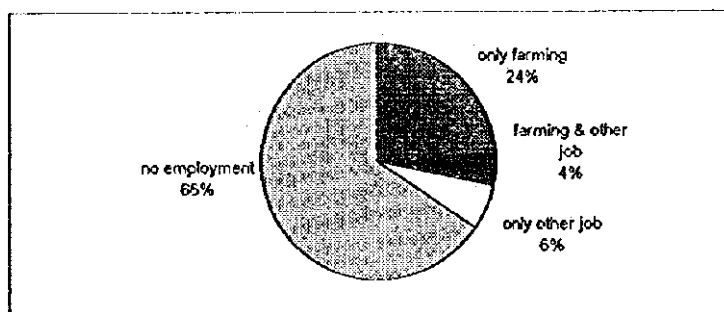
Average number per household

Male	Female	Total
2.65	2.66	5.25

Composition by sex



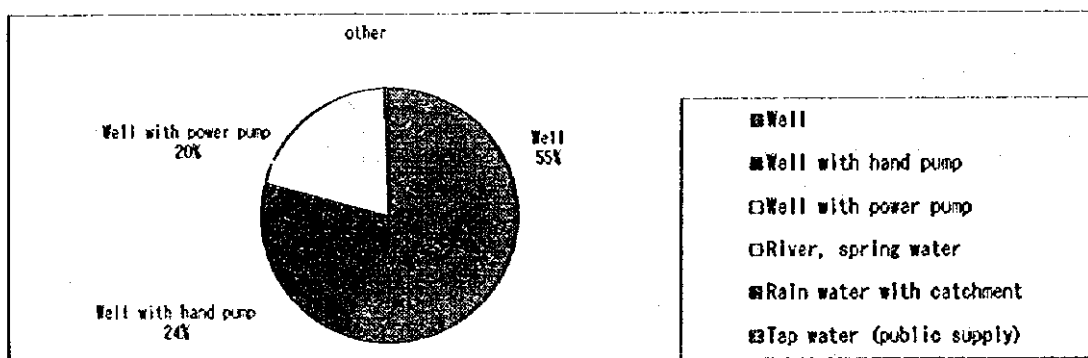
Q1-2 Employment



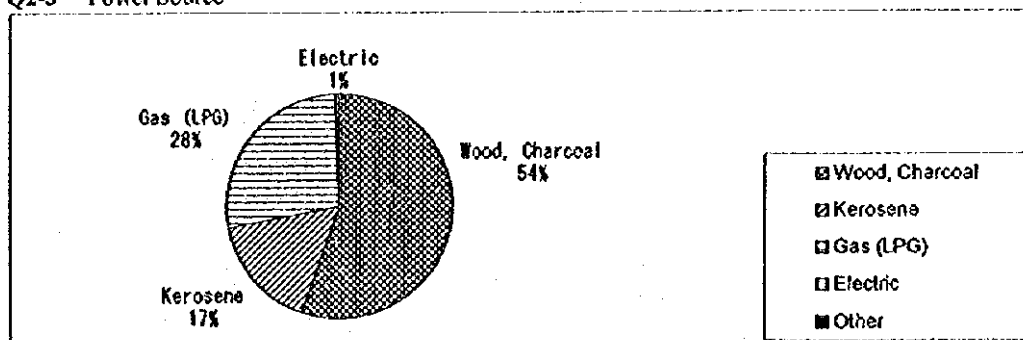
Q2-1 Diffusion Rate of Electricity

92%

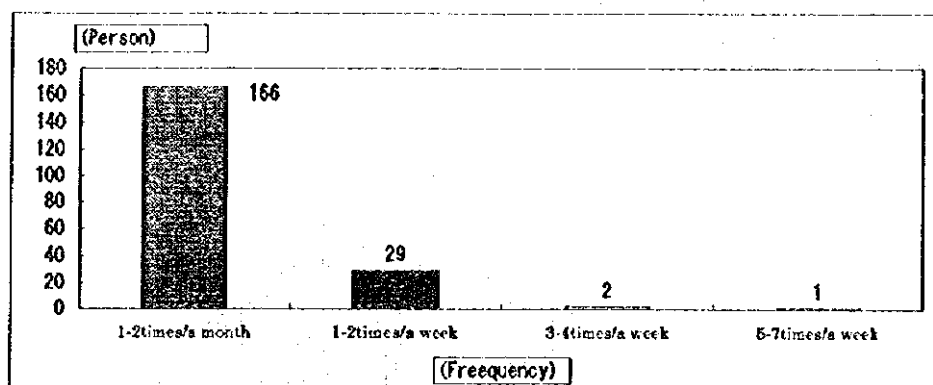
Q2-2 Water Source



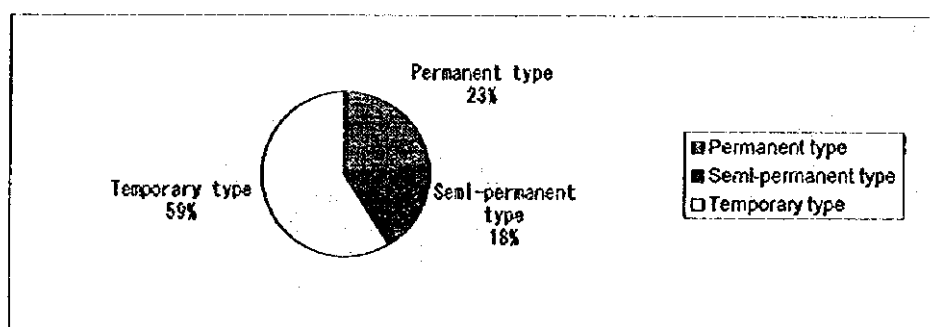
Q2-3 Power Source



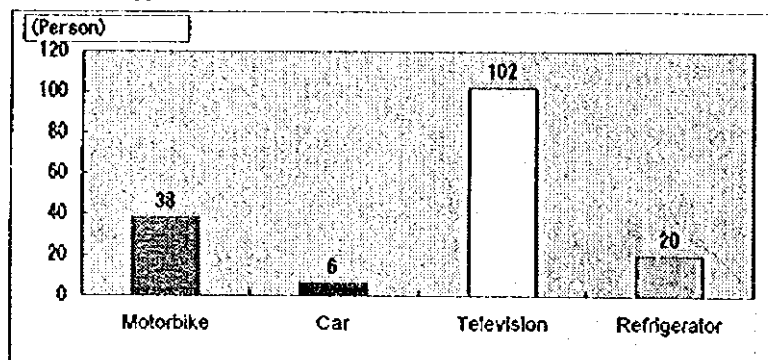
Q2-4 Frequency of meat intake



Q2-5 House type



Q2-6 Car & appliances



Q10 Living expenditure/person (average)

Rp. 440,778

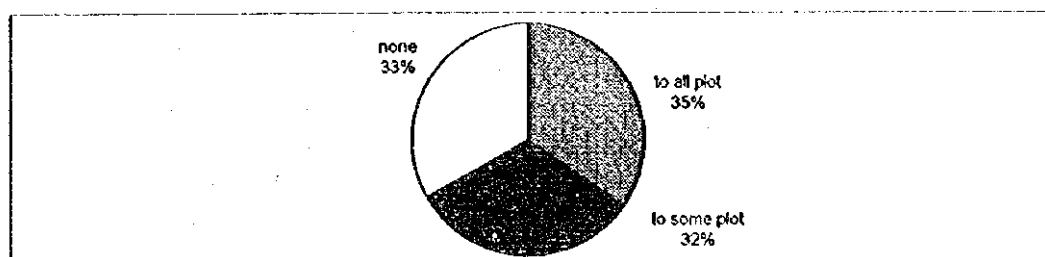
(Q10-2)/(Q1-1)

(8.21% of average total income)

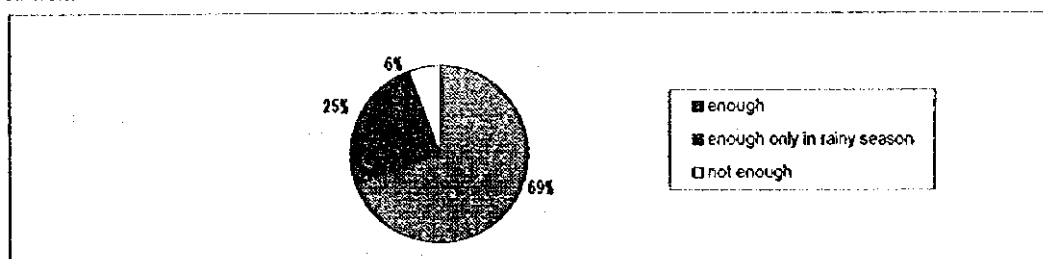
FARMING CONDITIONS

Province No.
1

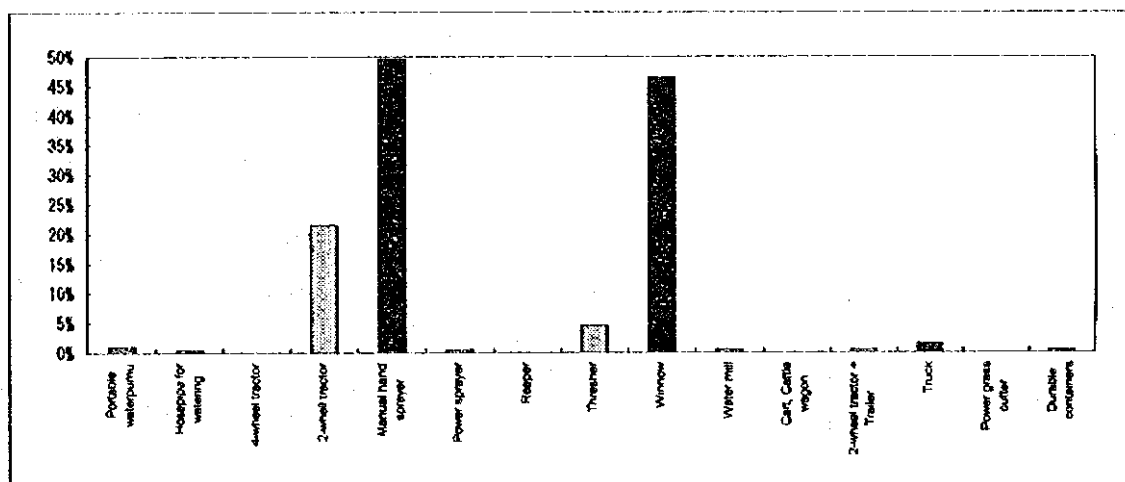
Q5-1 Access Road to Plots



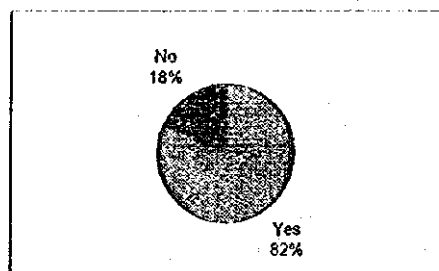
Q5-2 Irrigation Water



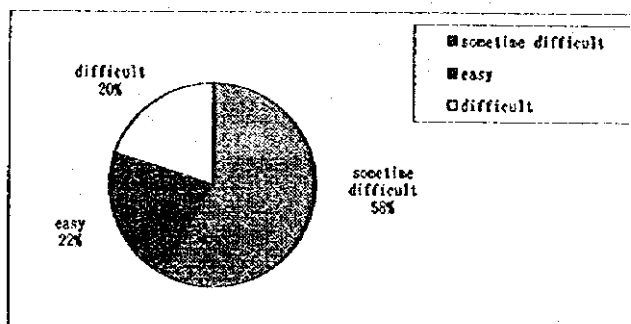
Q6-1 Equipment



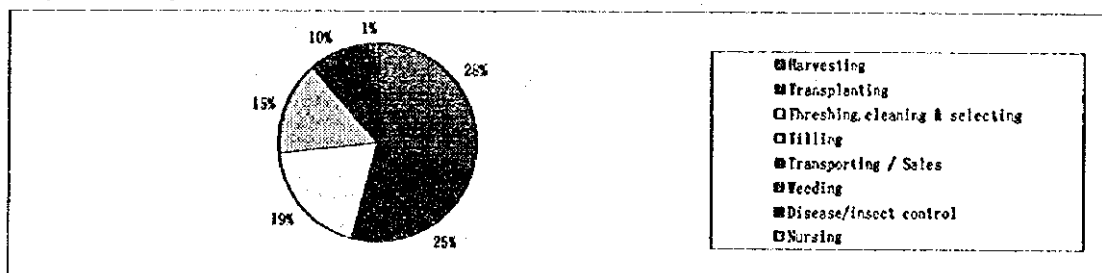
Q8-1 Use of wage worker



Q8-2 Difficulty of finding workers

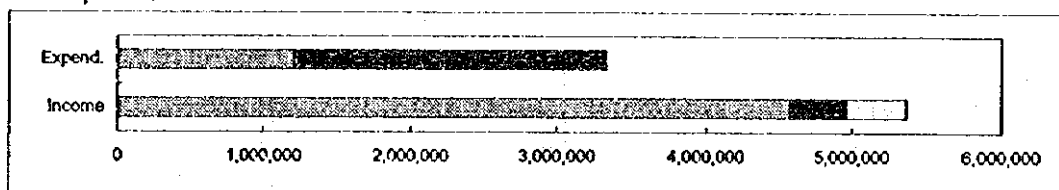


Q8-3 Objectives of using workers

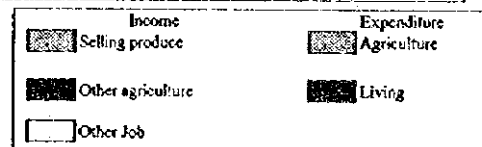


Q9 Income & Expenditure

Q10



	Sales of produce	Other agri.	Other job
Income	4,572,230	386,590	414,307
Expend.	1,210,766	2,123,683	



Province No.

1

Data for Living/Farming Condition

Q1-1 How many people in your family?

men
women
Total

(%)	(av. count)
50%	2.65
51%	2.66
101%	5.25

Q1-2 How many people working for the farming in your family?

- 1 Full time for farming / only farming
- 2 Part time for farming / farming and other jobs
- 3 Not participated / only other jobs
- (4 No employment)

(%)	(count)
24%	251
4%	47
6%	63
66%	689

Q2-1 Do you have (use) electricity in your house?

- a Yes
- b No

(%)	(count)
92%	181
8%	16

Q2-2 How do you get water for house use?

- a Well
- b Well (with hand pump)
- c Well (with power pump)
- d River (include spring water)
- e Rain (with water catchment)
- f Tap water (public water supply)

(%)	(count)
55%	107
24%	46
20%	39
0%	0
0%	0
1%	1

Q2-3 What kind of power source do you use for cooking?

- a Wood, charcoal
- b Kerosene
- c Gas (LPG)
- d Electric
- e Other

(%)	(count)
55%	110
17%	33
28%	55
1%	1
0%	0

Q2-4 How often do you eat meat?

- a 1 - 2 times in a month (eat seldom)
- b 1 - 2 times in a week (eat sometimes)
- c 3 - 4 times in a week (eat every other day)
- d 5 - 7 times in a week (eat almost every day)

(%)	(count)
84%	166
15%	29
1%	2
1%	1

Q2-5 Type of house

- a Permanent type (brick wall, ceramic roof, cement floor)
- b Semi-permanent type (wood wall, ceramic roof, cement floor or ground)
- c Temporary type (any type other than a, b)

(%)	(count)
23%	37
18%	29
59%	95

Q2-6 Do you have the goods mentioned below? (%=each answer/200)

- a Motorbike
- b Car(4-wheel, 3-wheel)
- c Television
- d Refrigerator

(%)	(count)
19%	38
3%	6
51%	102
10%	20

Q5-1 Do you have the access road to your plots which has enough width for hand-tractor (min. 1.5 m width) ?

- a Yes, there are roads to all plots
b There are roads to some plots
c No, there is no access road at all

(%)	(count)
35%	68
32%	64
33%	65

Q5-2 Do you have enough irrigation water for farming in your field ?

- a Enough supply in both dry and rainy season
b Enough supply in rainy season but not enough in dry season
c Not enough supply in neither rainy nor dry season

(%)	(count)
70%	133
25%	47
6%	11

Q6-1 What kind of equipment do you have? (%=each answer/200)

	(%)	(count)
a Portable water pump	1%	2
b Hosepipe for irrigation	1%	1
c 4-wheel tractor	0%	0
d 2-wheel tractor	22%	43
e Manual hand sprayer	50%	99
f Power sprayer	1%	1
g Reaper	0%	0
h Thresher	5%	9

- i Winnow
j Water mill
k Cart, Cattle wagon
l 2-wheel hand tractor + Trailer
m Truck (3-wheel, 4-wheel)
n Grass cutter for weeding
o Durable container for handling

(%)	(count)
47%	93
1%	1
0%	0
1%	1
2%	3
0%	0
1%	1

Q8-1 Do you use wage workers (laborer paid with money and/or produce) ?

- a Yes
b No

(%)	(count)
82%	160
18%	36

Q8-2 Is it difficult to find workers ?

- a easy
b sometimes difficult
c always difficult

(%)	(count)
22%	38
58%	101
20%	35

Q8-3 What are your objectives of using workers? (%=each answer/total nos. of answer)

	(%)	(count)
a Tilling	15%	87
b Transplanting	25%	144
c Weeding	1%	4
d Disease/insect control	1%	3
e Harvesting	29%	166
f Threshing, cleaning & selecting	19%	109

- g Nursing
h Transporting / Sales
i Others

(%)	(count)
1%	3
10%	55
0%	1

Q9/Q10 Income/Expenditure

	Sales of produce	Other agri.	Other job
Income	4,572,230	386,590	414,307
Expend.	1,210,766	2,123,683	

Crop Summary for South Sulawesi

Crop	Count	Farmer %	Av. ha	Av. Harvest (kg)	Yield (Kg/ha)	Av. Sale (kg)	Sale %	P/Hvst. %
Paddy	200	100.0%	2.70	14,127	5,238.4	10,525	74.5%	9.1%
Cacao	38	19.0%	0.40	291	724.8	276	95.1%	65.8%
Coconut*	20	10.0%	0.33	796	2,417.9	690	86.8%	5.0%
Banana	13	6.5%	0.38	335	884.2	255	76.2%	7.7%
Mango	1	0.5%	0.40	1,500	3,750.0	1,000	66.7%	0.0%
Orange	1	0.5%	0.20	325	1,625.0	325	100.0%	0.0%
Wax Apple	1	0.5%	3.00	1,000	333.3	1,000	100.0%	100.0%
Mungbean	1	0.5%	0.80	400	500.0	400	100.0%	0.0%
Peanut	1	0.5%	0.30	600	2,000.0	400	66.7%	0.0%

Remark : Area for crops other than paddy are declared as garden area with extensive farming.

*Av Harvest, Yield = unit

P/Hvst. % (Post-harvest %) is % of farmers applying post-harvest treatment for the crop.

Province No.
1

Q1 Major problems for growing crops and feeding animal

- | | | |
|---|-----|--|
| c | 36% | Damage by insect, disease, rodent, bird, animals |
| d | 29% | Too much production cost (seed, fertilizer, water fee, feed, etc.) |
| b | 17% | Irrigation water (shortage, flood, etc.) |
| f | 8% | Other problems caused by natural environment of region |
| a | 4% | Poor soil fertility |
| g | 4% | I don't know what is my problem / I feel no problem |
| e | 2% | Bad seed quality, difficult to get good seed |

Q2 Major problems for marketing farm produce

- | | | |
|---|-----|--|
| a | 29% | Cheap selling price |
| d | 24% | Middle-man (broker, wholesaler) who have capital keep the selling price low. |
| g | 19% | Seasonal fluctuation of selling price (unstable selling price) |
| e | 16% | Unable to do the proper treatment before selling (treatment = drying, cleaning, grading, sorting, packing) |
| b | 4% | Quality doesn't meet market requirement and can't sell all the produce |
| h | 4% | I don't know what is my problem / I feel no problem |
| f | 3% | Deterioration and/or Damage by insect/disease/animal after harvesting |
| c | 1% | No transportation means to the market or collection point |

Q3 Idea for increasing income

- | | | |
|---|-----|---|
| b | 35% | To expand / enlarge the farm scale |
| e | 33% | To add the value to the produce by processing |
| d | 11% | To change the marketing method |
| c | 11% | To introduce the new crops / animals |
| f | 6% | No idea for increasing income |
| a | 4% | Satisfied with the present income level |

Q3-1 Idea to expand / enlarge farm scale

- | | | |
|---|-----|--|
| a | 34% | Purchase the land |
| b | 34% | Lease the land |
| d | 22% | Other |
| c | 10% | Cooperate with other farmer(s) / cooperative |

Q3-2 Kinds of crops / animals to introduce

- | | | |
|---|-----|--------------------------|
| a | 38% | Rice |
| g | 15% | Poultry |
| b | 14% | Palawija |
| k | 9% | Fish |
| c | 7% | Vegetable |
| d | 6% | Fruit |
| l | 4% | Estate crops |
| m | 2% | Other |
| i | 2% | Cattle / meat |
| f | 2% | Sheep, goat |
| e | 0% | Pig |
| h | 0% | Cattle / milk |
| j | 0% | Flower, ornamental plant |

Q3-3 Problem or worry for expanding farm scale or introducing new crops / animals

- | | | |
|---|-----|----------------------------------|
| a | 81% | Capital |
| b | 9% | Skill / technique for production |
| c | 6% | Marketing of produce |
| d | 3% | Other |

Q3-4 Idea of improving marketing channel

- | | | |
|---|-----|--|
| b | 51% | Sell to intermediates at the farm |
| d | 28% | Sell to the processors directly |
| e | 11% | Cooperative or cooperate with other farmers |
| a | 8% | Sell to consumers directly at the market |
| c | 1% | Sell to whole seller / retailer directly at the market |
| f | 1% | Other |

Q4 Idea of improving conditions of farm field

c	47%	Rehabilitate irrigation canal
a	19%	Improve/make access road
f	13%	Enlarge / expand field
d	9%	Improve drainage
b	7%	Make irrigation canal
e	3%	Install irrigation pump
g	3%	Other

Q5 Agricultural practice for which machine / equipment are necessary

a	36%	Tilling
c	24%	Harvesting
b	17%	Transplanting
f	8%	Transporting
e	7%	Drying
d	6%	Threshing
i	1%	Other
g	1%	Feeding animal
h	0%	Milking

Q6-1 Knowledge of Official Credit Service

b	90%	Yes, I know.
a	10%	No, I don't know.

Q6-2 Experience of receiving loan from the Official Credit Service

b	79%	Yes
a	21%	No

Q6-3 Request to Official Credit Service

d	31%	Simplify application procedure
b	30%	Lower interest
a	24%	Raise limitation of debt amount
c	6%	Extend term
f	6%	No opinion
g	2%	No request, being satisfied with the present service
e	1%	Place bank/institute more closer to village

Q7 Request to Agricultural Extension Services

b	23%	Intensify the door to door technical service (visit more frequently)
d	19%	Supply of information related to the cropping (new variety, market trend)
h	17%	Increase the variety of demonstration plots (i.e: mechanization, vegetable growing, estate crops, etc.)
e	14%	Teach about the know-how of farm management / operation
c	11%	Improve the skill / knowledge of extension worker
f	6%	Supply of market price information
g	4%	Teach about the official credit service
i	3%	Other
a	2%	No request

Attachment E.3 Results of Survey

(2) West Java

LIVING CONDITIONS

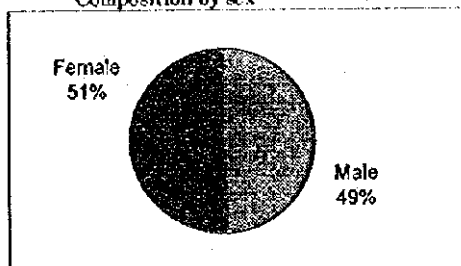
Province No.
2

Q1-1 Family Component

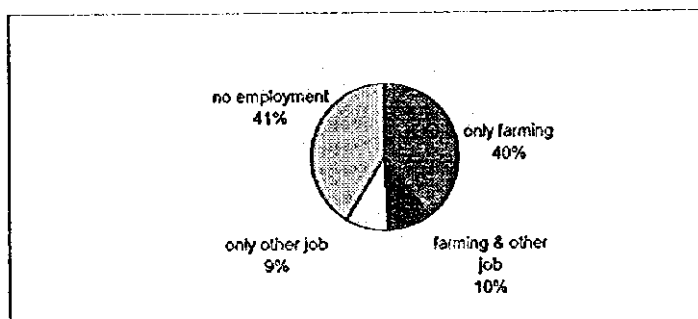
Average number per household

Male	Female	Total
2.3	2.38	4.685

Composition by sex



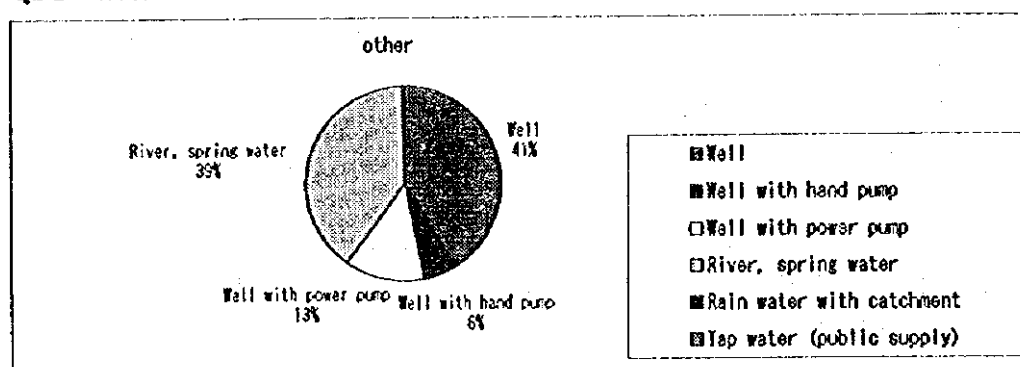
Q1-2 Employment



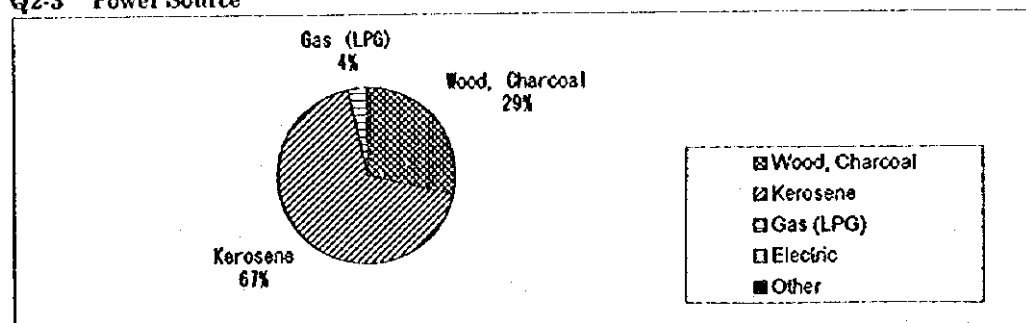
Q2-1 Diffusion Rate of Electricity

98%

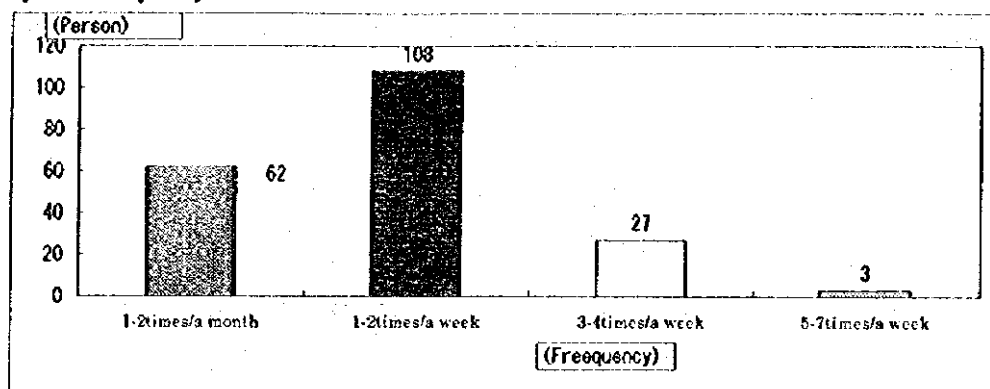
Q2-2 Water Source



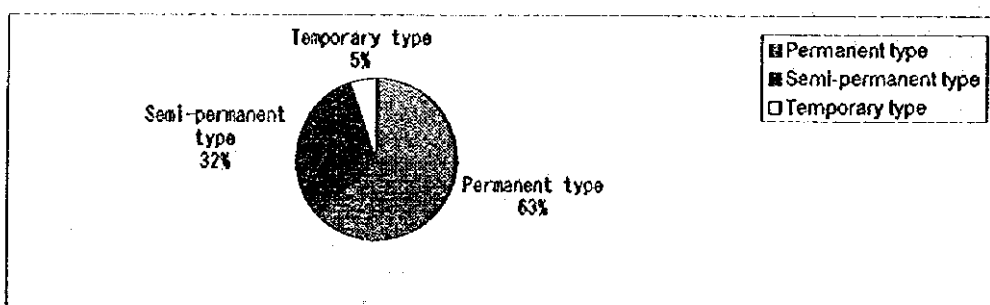
Q2-3 Power Source



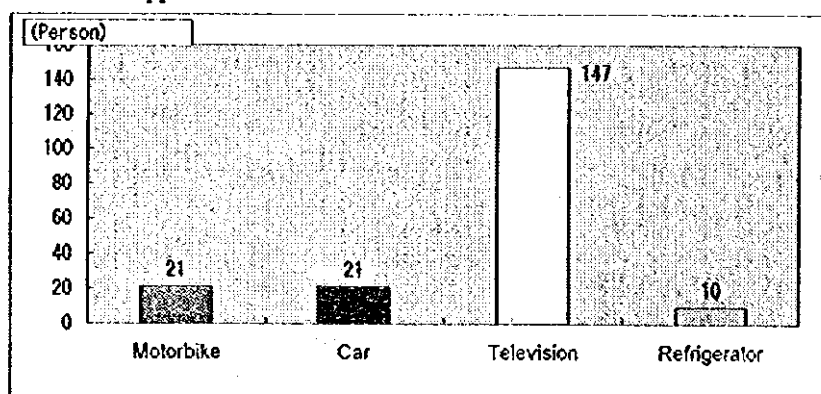
Q2-4 Frequency of meat intake



Q2-5 House type



Q2-6 Car & appliances



Q10 Living expenditure/person (average)

Rp. 312,600

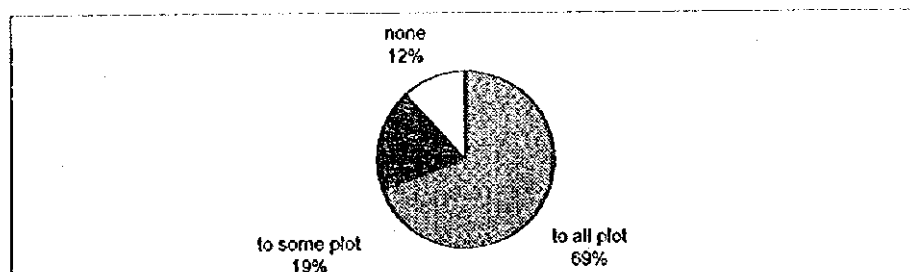
(Q10-2)/(Q1-1)

(2.96% of average total income)

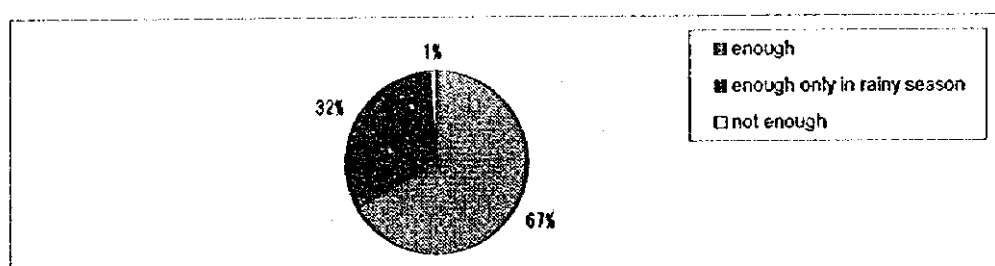
FARMING CONDITIONS

Province No.
2

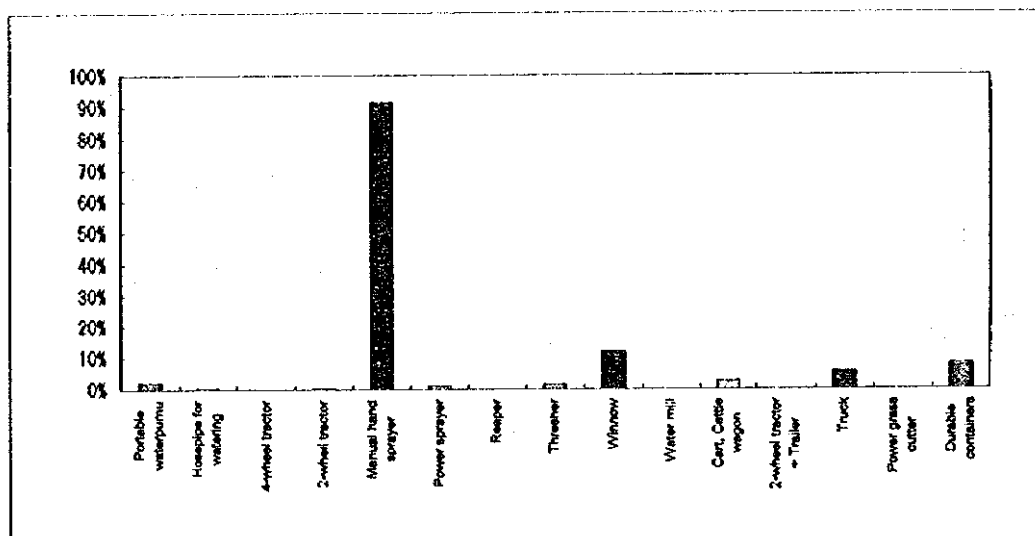
Q5-1 Access Road to Plots



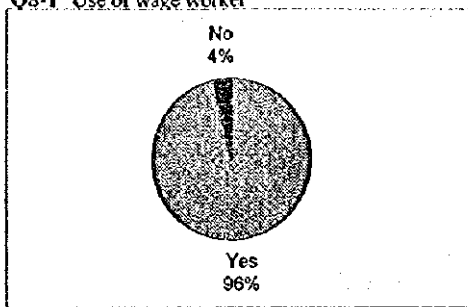
Q5-2 Irrigation Water



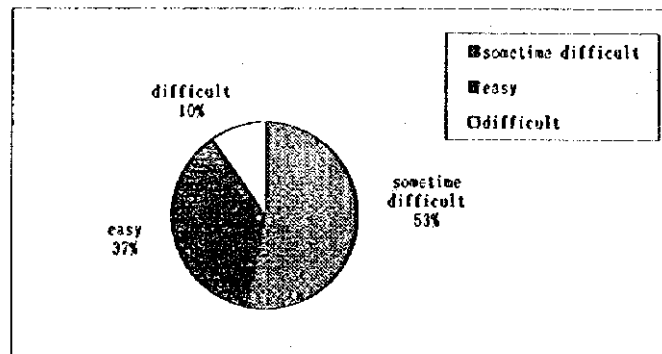
Q6-1 Equipment



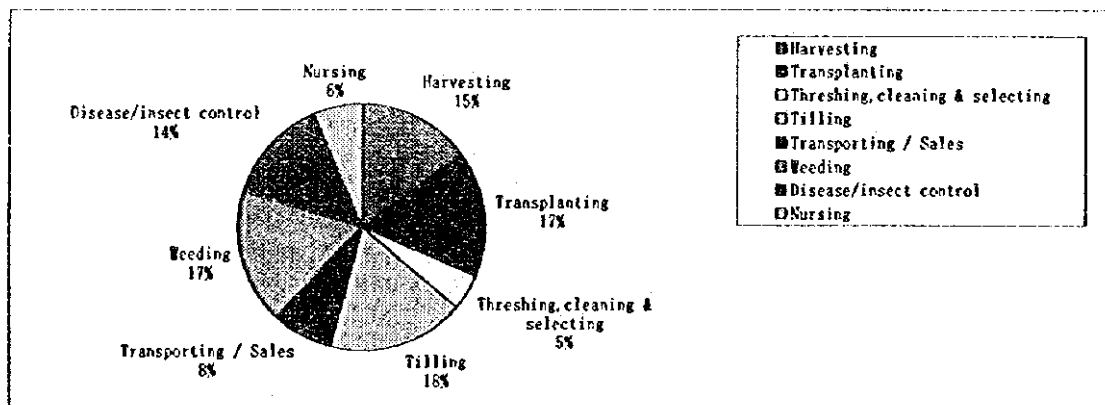
Q8-1 Use of wage worker



Q8-2 Difficulty of finding workers

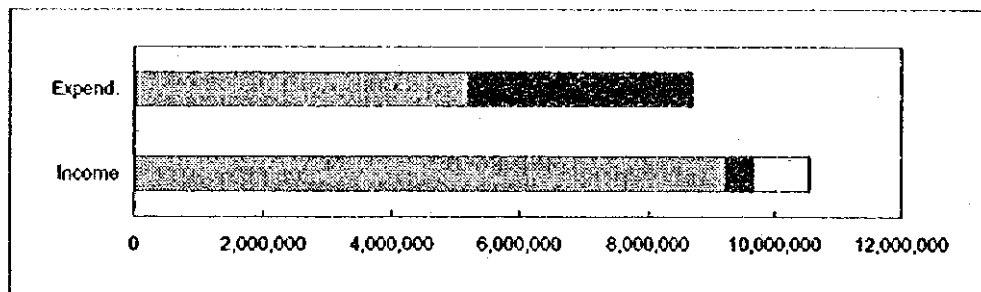


Q8-3 Objectives of using workers

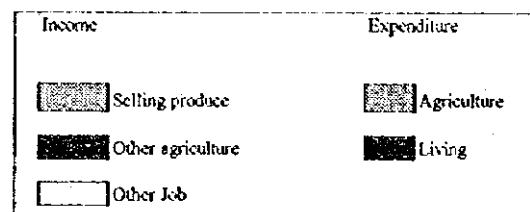


Q9 Income & Expenditure

Q10



	Sales of produce	Other agri.	Other job
Income	9,236,379	418,944	896,080
Expend.	5,211,366	3,493,103	



Province No.
2

Data for Living/Farming Condition

Q1-1 How many people in your family?

men
women
Total

(%)	(count)
49%	231
51%	238
100%	469

Q1-2 How many people working for the farming in your family?

- 1 Full time for farming / only farming
- 2 Part time for farming / farming and other jobs
- 3 Not participated / only other jobs
- (4 No employment)

(%)	(count)
40%	374
10%	90
9%	85
41%	388

Q2-1 Do you have (use) electricity in your house?

- a Yes
- b No

(%)	(count)
98%	196
2%	4

Q2-2 How do you get water for house use?

- a Well
- b Well (with hand pump)
- c Well (with power pump)
- d River (include spring water)
- e Rain (with water catchment)
- f Tap water (public water supply)

(%)	(count)
42%	83
6%	11
13%	26
40%	79
0%	0
1%	1

Q2-3 What kind of power source do you use for cooking?

- a Wood, charcoal
- b Kerosene
- c Gas (LPG)
- d Electric
- e Other

(%)	(count)
29%	57
68%	136
4%	7
0%	0
0%	0

Q2-4 How often do you eat meat?

- a 1 - 2 times in a month (eat seldom)
- b 1 - 2 times in a week (eat sometimes)
- c 3 - 4 times in a week (eat every other day)
- d 5 - 7 times in a week (eat almost every day)

(%)	(count)
31%	62
54%	108
14%	27
2%	3

Q2-5 Type of house

- a Permanent type (brick wall, ceramic roof, cement floor)
- b Semi-permanent type (wood wall, ceramic roof, cement floor or ground)
- c Temporary type (any type other than a,b)

(%)	(count)
63%	122
32%	62
5%	10

Q2-6 Do you have the goods mentioned below? (%=each answer/200)

- a Motorbike
- b Car(4-wheel, 3-wheel)
- c Television
- d Refrigerator

(%)	(count)
11%	21
11%	21
74%	147
5%	10

Q5-1 Do you have the access road to your plots which has enough width for hand-tractor (min. 1.5 m width) ?

- a Yes, there are roads to all plots
b There are roads to some plots
c No, there is no access road at all

(%)	(count)
69%	136
19%	37
12%	23

Q5-2 Do you have enough irrigation water for farming in your field ?

- a Enough supply in both dry and rainy season
b Enough supply in rainy season but not enough in dry season
c Not enough supply in neither rainy nor dry season

(%)	(count)
67%	133
32%	64
1%	2

Q6-1 What kind of equipment do you have? (%=each answer/200)

	(%)	(count)
a Portable water pump	2%	4
b Hosepipe for irrigation	1%	1
c 4-wheel tractor	0%	0
d 2-wheel tractor	1%	1
e Manual hand sprayer	92%	183
f Power sprayer	1%	2
g Reaper	0%	0
h Thresher	2%	3

- i Winnow
j Water mill
k Cart, Cattle wagon
l 2-wheel hand tractor + Trailer
m Truck (3-wheel,4-wheel)
n Grass cutter for wooding
o Durable container for handling

(%)	(count)
12%	24
0%	0
3%	5
0%	0
6%	11
0%	0
8%	16

Q8-1 Do you use wage workers (laborer paid with money and/or produce) ?

- a Yes
b No

(%)	(count)
97%	193
4%	7

Q8-2 Is it difficult to find workers ?

- a easy
b sometimes difficult
c always difficult

(%)	(count)
37%	71
53%	103
10%	19

Q8-3 What are your objectives of using workers? (%=each answer/total nos. of answer)

- a Tilling
b Transplanting
c Weeding
d Disease/insect control
e Harvesting
f Threshing, cleaning & selecting

(%)	(count)
18%	181
17%	167
17%	174
14%	137
14%	146
5%	46

- g Nursing
h Transporting / Sales
i Others

(%)	(count)
6%	64
8%	80
2%	17

Q9/Q10 Income/Expenditure

	Sales of produce	Other agri.	Other job
Income	9,236,379	418,944	896,080
Expend	5,211,366	3,498,108	

Crop Summary for West Java

Crop	Count	Farmer %	Av. ha	Av. Harvest (kg)	Yield (Kg/ha)	Av. Sale (kg)	Sale %	PIHst. %
Paddy	72	36.0%	0.50	2,678	5,366.9	2,165	80.9%	18.1%
Snap bean	60	30.0%	0.48	5,518	11,592.5	5,510	99.9%	3.3%
Leek	54	27.0%	0.43	9,509	21,914.6	9,372	98.6%	5.6%
Tomato	51	25.5%	0.86	18,000	20,871.3	18,000	100.0%	2.0%
Chili	38	19.0%	0.37	3,418	9,224.4	3,414	99.9%	10.5%
Celery	38	19.0%	0.40	7,095	17,597.4	7,095	100.0%	0.0%
Chinese cabbage	36	18.0%	0.97	13,518	14,006.3	13,518	100.0%	0.0%
Carrot	34	17.0%	0.28	3,199	11,514.0	3,125	97.7%	2.9%
Potato	34	17.0%	1.05	4,223	4,020.2	4,146	98.2%	0.0%
Corn	30	15.0%	0.39	2,353	6,055.3	2,325	98.8%	6.7%
Cabbage	27	13.5%	0.69	12,122	17,644.2	12,122	100.0%	3.7%
Saisin	25	12.5%	0.21	1,636	7,652.9	1,633	99.8%	4.0%
Garlic	18	9.0%	0.25	1,614	6,587.3	1,614	100.0%	11.1%
Garden peas	15	7.5%	0.25	432	1,737.3	431	99.8%	20.0%
Cucumber	11	5.5%	0.22	1,894	8,504.1	1,886	99.6%	0.0%
Cauliflower	7	3.5%	0.20	4,257	21,531.8	4,257	100.0%	0.0%
Salad leaves	6	3.0%	0.18	2,403	13,451.5	2,378	99.0%	0.0%
Tea	6	3.0%	0.72	8,225	11,450.1	8,225	100.0%	0.0%
Cassava	5	2.5%	0.09	1,220	13,707.9	1,200	98.4%	0.0%
Red kidney bean	5	2.5%	0.23	1,170	5,043.1	1,170	100.0%	20.0%

Remark: Incomplete data are excluded.

Crops less than 5 counts are not listed.

PIHst. % (Post-harvest %) is % of farmers applying post-harvest treatment for the crop.

Province No.
2

Q1 Major problems for growing crops and feeding animal

- | | | |
|---|-----|--|
| c | 33% | Damage by insect, disease, rodent, bird, animals |
| d | 33% | Too much production cost (seed, fertilizer, water fee, feed, etc.) |
| b | 9% | Irrigation water (shortage, flood, etc.) |
| f | 9% | Other problems caused by natural environment of region |
| a | 1% | Poor soil fertility |
| g | 0% | I don't know what is my problem / I feel no problem |
| e | 14% | Bad seed quality, difficult to get good seed |

Q2 Major problems for marketing farm produce

- | | | |
|---|-----|--|
| a | 30% | Cheap selling price |
| d | 24% | Middle-man (broker, wholesaler) who has capital keep the selling price low. |
| g | 24% | Seasonal fluctuation of selling price (unstable selling price) |
| e | 7% | Unable to do the proper treatment before selling (treatment = drying, cleaning, grading, sorting, packing) |
| b | 8% | Quality does not meet market requirement and cannot sell all the produce |
| h | 0% | I don't know what is my problem / I feel no problem |
| f | 4% | Deterioration and/or Damage by insect/disease/animal after harvesting |
| c | 2% | No transportation means to the market or collection point |

Q3 Idea for increasing income

- | | | |
|---|-----|---|
| b | 32% | To expand / enlarge the farm scale |
| e | 12% | To add the value to the produce by processing |
| d | 25% | To change the marketing method |
| c | 28% | To introduce the new crops / animals |
| f | 1% | No idea for increasing income |
| a | 2% | Satisfied with the present income level |

Q3-1 Idea to expand / enlarge farm scale

- | | | |
|---|-----|--|
| a | 28% | Purchase the land |
| b | 39% | Lease the land |
| d | 5% | Other |
| c | 28% | Cooperate with other farmer(s) / cooperative |

Q3-2 Kinds of crops / animals to introduce

- | | | |
|---|-----|--------------------------|
| a | 9% | Rice |
| g | 6% | Poultry |
| b | 6% | Palawija |
| k | 2% | Fish |
| c | 36% | Vegetable |
| d | 2% | Fruit |
| l | 1% | Estate crops |
| m | 1% | Other |
| i | 6% | Cattle / meat |
| f | 19% | Sheep, goat |
| e | 0% | Pig |
| h | 8% | Cattle / milk |
| j | 4% | Flower, ornamental plant |

Q3-3 Problem or worry for expanding farm scale or introducing new crops / animals

- | | | |
|---|-----|----------------------------------|
| a | 61% | Capital |
| b | 14% | Skill / technique for production |
| c | 20% | Marketing of produce |
| d | 2% | Other |

Q3-4 Idea of improving marketing channel

- | | | |
|---|-----|--|
| b | 46% | Sell to intermediates at the farm |
| d | 10% | Sell to the processors directly |
| e | 7% | Cooperative or cooperate with other farmers |
| a | 18% | Sell to consumers directly at the market |
| c | 18% | Sell to whole seller / retailer directly at the market |
| f | 1% | Other |

Q1 Idea of improving conditions of farm field

c	26%	Rehabilitate irrigation canal
a	18%	Improve/make access road
f	23%	Enlarge / expand field
d	4%	Improve drainage
b	9%	Make irrigation canal
e	12%	Install irrigation pump
g	8%	Other

Q5 Agricultural practice for which machine / equipment are necessary

a	32%	Tilling
c	5%	Harvesting
b	5%	Transplanting
f	24%	Transporting
e	1%	Drying
d	3%	Threshing
i	17%	Other
g	11%	Feeding animal
h	3%	Milking

Q6-1 Knowledge of Official Credit Service

b	78%	Yes, I know.
a	22%	No, I don't know.

Q6-2 Experience of receiving loan from the Official Credit Service

b	56%	Yes
a	44%	No

Q6-3 Request to Official Credit Service

d	22%	Simplify application procedure
b	40%	Lower interest
a	14%	Raise limitation of debt amount
c	24%	Extend term
f	0%	No opinion
g	0%	No request, being satisfied with the present service
e	0%	Place bank/institute more closer to village

Q7 Request to Agricultural Extension Services

b	21%	Intensify the door to door technical service (visit more frequently)
d	14%	Supply of information related to the cropping (new variety, market trend)
h	11%	Increase the variety of demonstration plots (i.e: mechanization, vegetable growing, estate crops, etc.)
e	9%	Teach about the know-how of farm management / operation
c	14%	Improve the skill / knowledge of extension worker
f	25%	Supply of market price information
g	5%	Teach about the official credit service
i	0%	Other
a	0%	No request

Attachment E.3 Results of Survey

(3) West Nusa Tenggara

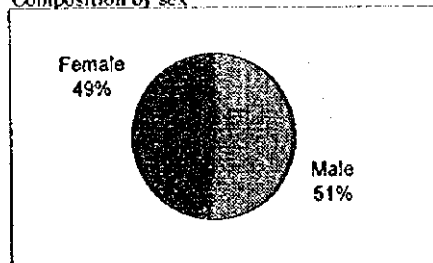
LIVING CONDITIONS

Province No.
3

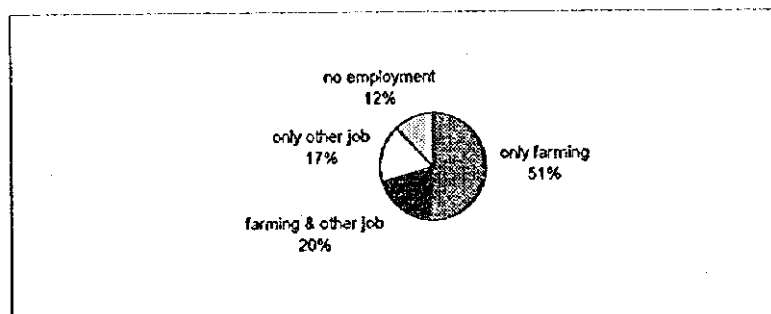
Q1-1 Family Component

Average number per household		
Male	Female	Total
2.47	2.39	4.83

Composition by sex



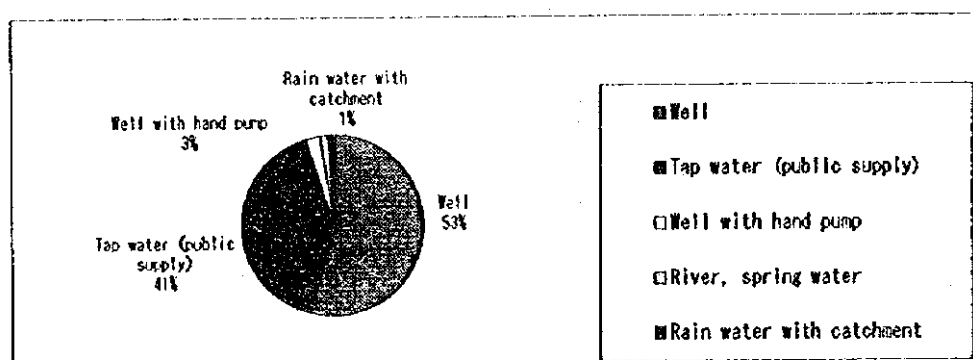
Q1-2 Employment



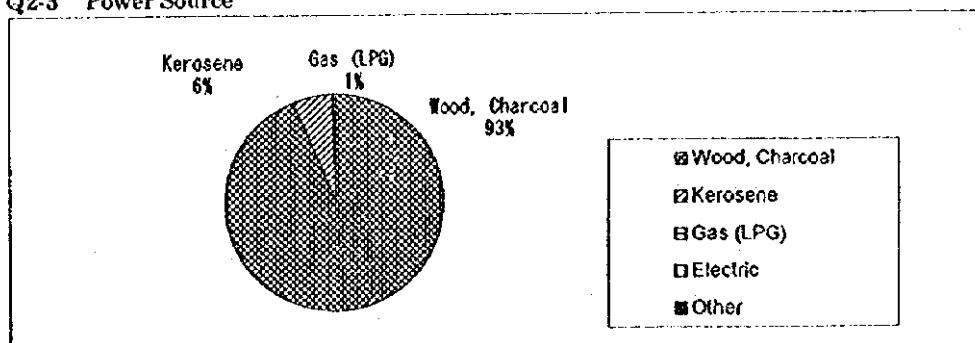
Q2-1 Diffusion Rate of Electricity

34%

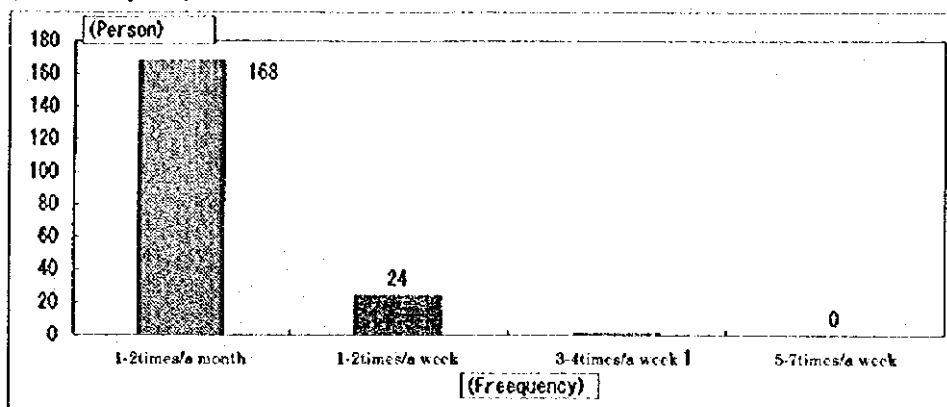
Q2-2 Water Source



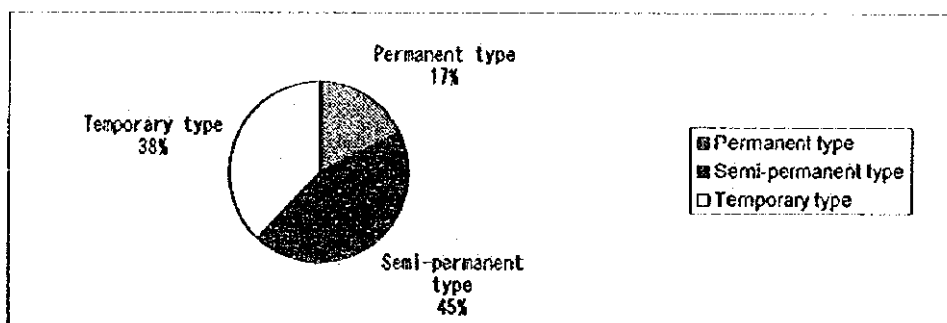
Q2-3 Power Source



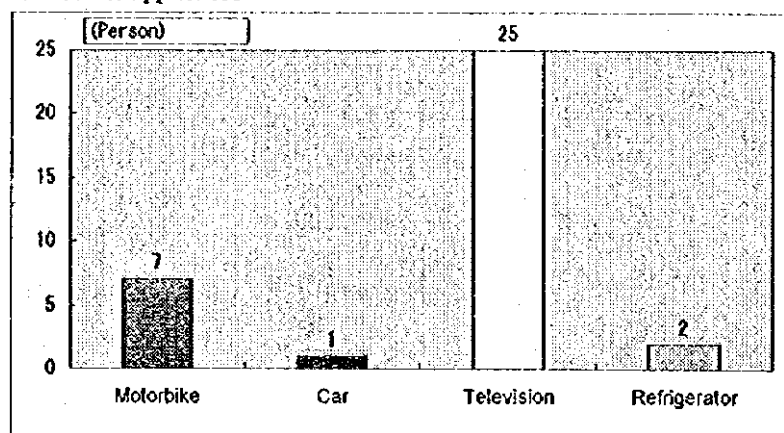
Q2-4 Frequency of meat intake



Q2-5 House type



Q2-6 Car & appliances



Q10 Living expenditure/person (average)

Rp. 206,252

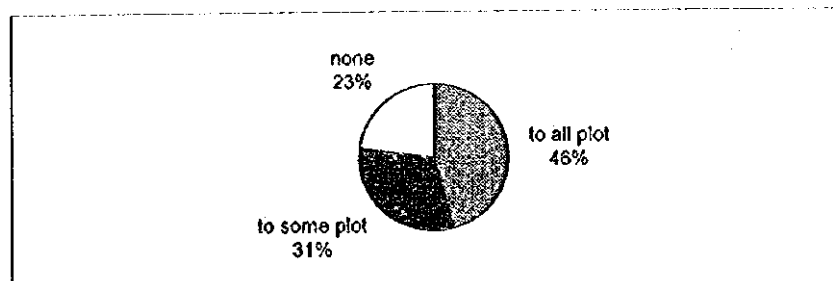
(Q10-2)/(Q1-1)

(13.65% of average total income)

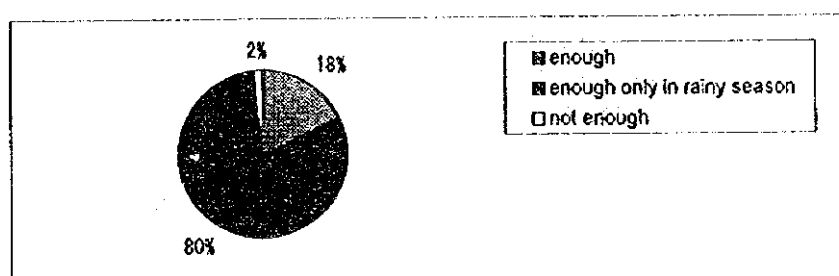
FARMING CONDITIONS

Province No.
3

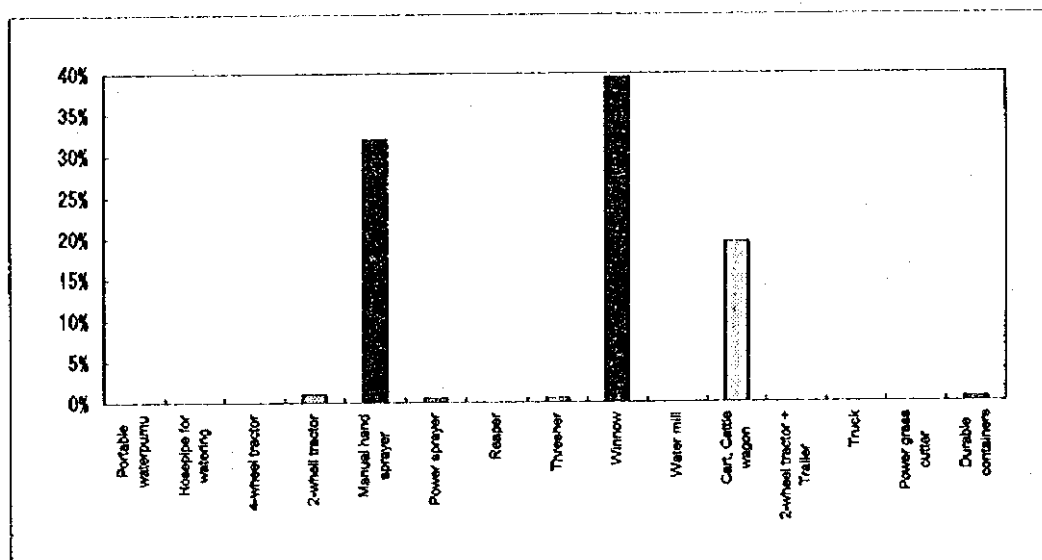
Q5-1 Access Road to Plots



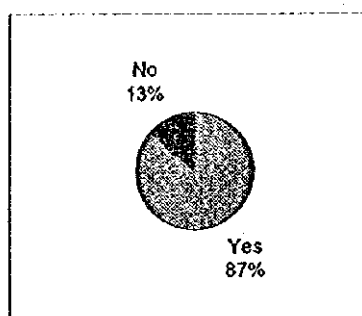
Q5-2 Irrigation Water



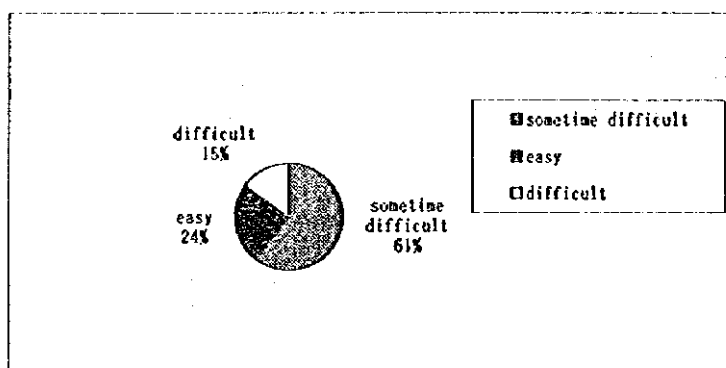
Q6-1 Equipment



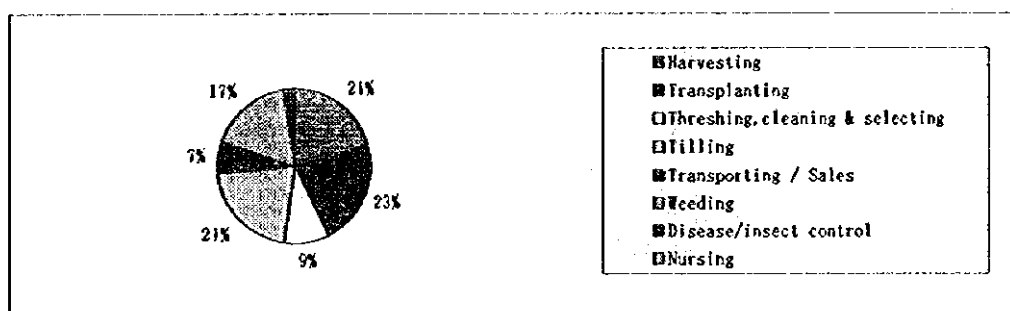
Q8-1 Use of wage worker



Q8-2 Difficulty of finding workers

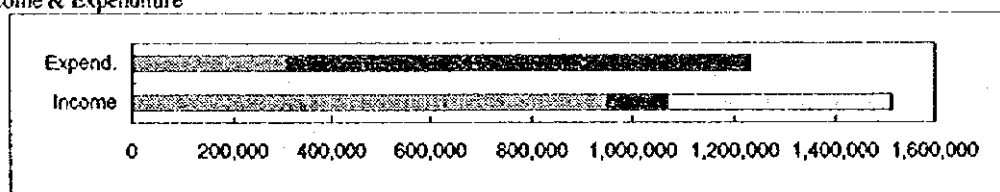


Q8-3 Objectives of using workers



Q9 Income & Expenditure

Q10



	Sales of produce	Other agri.	Other job
Income	951,155	117,267	445,466
Expend.	309,363	922,839	

Income	Expenditure
Selling produce	Agriculture
Other agriculture	Living
Other Job	

Province No.
3

Data for Living/Farming Condition

Q1-1 How many people in your family?

men
women
Total

(%)	(av. count)
51%	2.47
49%	2.39
101%	4.83

Q1-2 How many people working for the farming in your family?

- 1 Full time for farming / only farming
2 Part time for farming / farming and other jobs
3 Not participated / only other jobs
4 No employment

(%)	(count)
51%	492
20%	189
17%	165
12%	119

Q2-1 Do you have (use) electricity in your house?

- a Yes
b No

(%)	(count)
34%	67
66%	131

Q2-2 How do you get water for house use?

- a Well
b Well (with hand pump)
c Well (with power pump)
d River (include spring water)
e Rain (with water catchment)
f Tap water (public water supply)

(%)	(count)
54%	107
3%	5
1%	1
2%	3
1%	2
41%	81

Q2-3 What kind of power source do you use for cooking?

- a Wood, charcoal
b Kerosene
c Gas (LPG)
d Electric
e Other

(%)	(count)
94%	187
6%	12
1%	1
0%	0
0%	0

Q2-4 How often do you eat meat?

- a 1 - 2 times in a month (eat seldom)
b 1 - 2 times in a week (eat sometimes)
c 3 - 4 times in a week (eat every other day)
d 5 - 7 times in a week (eat almost every day)

(%)	(count)
87%	168
12%	24
1%	1
0%	0

Q2-5 Type of house

- a Permanent type (brick wall, ceramic roof, cement floor)
b Semi-permanent type (wood wall, ceramic roof, cement floor or ground)
c Temporary type (any type other than a, b)

(%)	(count)
17%	34
45%	87
38%	74

Q2-6 Do you have the goods mentioned below? (%=each answer/200)

- a Motorbike
b Car(4-wheel, 3-wheel)
c Television
d Refrigerator

(%)	(count)
4%	7
1%	1
15%	25
1%	2

Q5-1 Do you have the access road to your plots which has enough width for hand-tractor (min 1.5 m width) ?

- a Yes, there are roads to all plots
- b There are roads to some plots
- c No, there is no access road at all

(%)	(count)
46%	88
31%	60
23%	44

Q5-2 Do you have enough irrigation water for farming in your field ?

- a Enough supply in both dry and rainy season
- b Enough supply in rainy season but not enough in dry season
- c Not enough supply in neither rainy nor dry season

(%)	(count)
18%	34
81%	154
2%	3

Q6-1 What kind of equipment do you have? (%=each answer/200)

	(%)	(count)		(%)	(count)
a Portable water pump	0%	0	i Winnow	40%	79
b Hosepipe for irrigation	0%	0	j Water mill	0%	0
c 4-wheel tractor	0%	0	k Cart, Cattle wagon	20%	39
d 2-wheel tractor	1%	2	l 2-wheel hand tractor + Trailer	0%	0
e Manual hand sprayer	32%	64	m Truck (3-wheel,4-wheel)	0%	0
f Power sprayer	1%	1	n Grass cutter for weeding	0%	0
g Reaper	0%	0	o Durable container for handling	1%	1
h Thresher	1%	1			

Q8-1 Do you use wage workers (laborer paid with money and/or produce) ?

	(%)	(count)
a Yes	87%	169
b No	13%	26

Q8-2 Is it difficult to find workers ?

	(%)	(count)
a easy	24%	44
b sometimes difficult	60%	110
c always difficult	15%	28

Q8-3 What are your objectives of using workers? (%=each answer/total nos. of answer)

	(%)	(count)		(%)	(count)
a Tilling	21%	118	g Nursing	0%	1
b Transplanting	22%	122	h Transporting / Sales	7%	37
c Weeding	17%	94	i Others	1%	4
d Disease/insect control	2%	13			
e Harvesting	20%	113			
f Threshing, cleaning & selecting	9%	51			

Q9/Q10 Income/Expenditure

	Sales of produce	Other agri.	Other job
Income	951,155	117,267	445,466
Expend	309,363	922,839	

Crop Summary for West Nusa Tenggara

Crop	Count	Farmer %	Av. ha	Av. Harvest (kg)	Yield (Kg/ha)	Av. Sale (kg)	Sale %	P/Hvst. %
Paddy	138	69.0%	0.79	2,453	3,105.1	1,624	66.2%	19.6%
Corn	90	45.0%	0.54	747	1,383.3	673	90.1%	15.6%
Soybean	80	40.0%	0.61	416	682.0	378	90.9%	12.5%
Chili	50	25.0%	0.49	658	1,342.9	648	98.5%	16.0%
Mung Bean	39	19.5%	0.70	294	420.0	292	99.3%	15.4%
Other Beans	19	9.5%	0.55	303	550.9	289	95.4%	15.8%
Banana	10	5.0%	0.23	89	387.0	69	77.5%	30.0%
Peanuts	9	4.5%	0.34	224	658.8	224	100.0%	11.1%
Coconut *	4	2.0%	0.50	195	390.0	173	88.7%	50.0%
Tabasco	4	2.0%	0.22	205	931.8	193	94.1%	50.0%
Sea Plant	3	1.5%		600		600	100.0%	0.0%
Shallot	3	1.5%	0.12	246	2,050.0	235	95.5%	0.0%
Egg plant	2	1.0%	0.25	21	84.0	20	95.2%	0.0%
Cashew nuts	2	1.0%	0.35	50	142.9	50	100.0%	0.0%
Soursop	1	0.5%	0.50	30	60.0	30	100.0%	0.0%
Pineapple	1	0.5%	0.50	2,800	5,600.0	2,800	100.0%	0.0%
Tomato	1	0.5%	0.25	150	600.0	125	83.3%	0.0%
Mango	1	0.5%	0.10	40	400.0	40	100.0%	0.0%

Remark : * Av. Harvest, Yield = unit

P/Hvst. % (Post-harvest %) is % of farmers applying post-harvest treatment for the crop.

Province No.
3

Q1 Major problems for growing crops and feeding animal

c	17%	Damage by insect, disease, rodent, bird, animals
d	28%	Too much production cost (seed, fertilizer, water fee, feed, etc.)
b	27%	Irrigation water (shortage, flood, etc.)
f	11%	Other problems caused by natural environment of region
a	11%	Poor soil fertility
g	0%	I don't know what is my problem / I feel no problem
e	5%	Bad seed quality, difficult to get good seed

Q2 Major problems for marketing farm produce

a	28%	Cheap selling price
d	22%	Middle-man (broker, wholesaler) who have capital keep the selling price low.
g	27%	Seasonal fluctuation of selling price (unstable selling price)
e	3%	Unable to do the proper treatment before selling (treatment = drying, cleaning, grading, sorting)
b	11%	Quality doesn't meet market requirement and can't sell all the produce
h	1%	I don't know what is my problem / I feel no problem
f	3%	Deterioration and/or Damage by insect/disease/animal after harvesting
c	5%	No transportation means to the market or collection point

Q3 Idea for increasing income

b	30%	To expand / enlarge the farm scale
e	11%	To add the value to the produce by processing
d	10%	To change the marketing method
c	43%	To introduce the new crops / animals
f	3%	No idea for increasing income
a	4%	Satisfied with the present income level

Q3-1 Idea to expand / enlarge farm scale

a	35%	Purchase the land
b	50%	Lease the land
d	1%	Other
c	14%	Cooperate with other farmer(s) / cooperative

Q3-2 Kinds of crops / animals to introduce

a	18%	Rice
g	9%	Poultry
b	19%	Palawija
k	1%	Fish
c	9%	Vegetable
d	14%	Fruit
l	2%	Estate crops
m	1%	Other
i	17%	Cattle / meat
f	10%	Sheep, goat
e	0%	Pig
h	1%	Cattle / milk
j	0%	Flower, ornamental plant

Q3-3 Problem or worry for expanding farm scale or introducing new crops / animals

a	83%	Capital
b	14%	Skill / technique for production
c	3%	Marketing of produce
d	0%	Other

Q3-4 Idea of improving marketing channel

b	51%	Sell to intermediates at the farm
d	3%	Sell to the processors directly
e	1%	Cooperative or cooperate with other farmers
a	44%	Sell to consumers directly at the market
c	1%	Sell to whole seller / retailer directly at the market
f	0%	Other

Q1 Idea of improving conditions of farm field

c	24%	Rehabilitate irrigation canal
a	8%	Improve/make access road
f	18%	Enlarge / expand field
d	16%	Improve drainage
b	15%	Make irrigation canal
e	12%	Install irrigation pump
g	6%	Other

Q5 Agricultural practice for which machine / equipment are necessary

a	42%	Tilling
c	20%	Harvesting
b	7%	Transplanting
f	4%	Transporting
e	8%	Drying
d	6%	Threshing
i	8%	Other
g	5%	Feeding animal
h	0%	Milking

Q6-1 Knowledge of Official Credit Service

b	50%	Yes, I know.
a	50%	No, I don't know.

Q6-2 Experience of receiving loan from the Official Credit Service

b	36%	Yes
a	64%	No

Q6-3 Request to Official Credit Service

d	17%	Simplify application procedure
b	42%	Lower interest
a	4%	Raise limitation of debt amount
c	19%	Extend term
f	8%	No opinion
g	0%	No request, being satisfied with the present service
e	9%	Place bank/institute more closer to village

Q7 Request to Agricultural Extension Services

b	37%	Intensify the door to door technical service (visit more frequently)
d	20%	Supply of information related to the cropping (new variety, market trend)
h	11%	Increase the variety of demonstration plots (i.e: mechanization, vegetable growing, estate crop)
e	11%	Teach about the know-how of farm management / operation
c	6%	Improve the skill / knowledge of extension worker
f	10%	Supply of market price information
g	2%	Teach about the official credit service
i	0%	Other
a	3%	No request

Attachment E.3 Results of Survey

(4) South Kalimantan

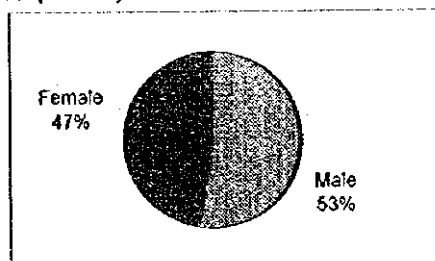
LIVING CONDITIONS

Province No.
4

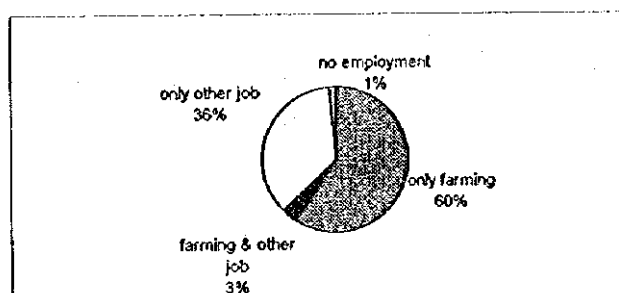
Q1-1 Family Component

Average number per household		
Male	Female	Total
2.3	2.105	4.44

Composition by sex



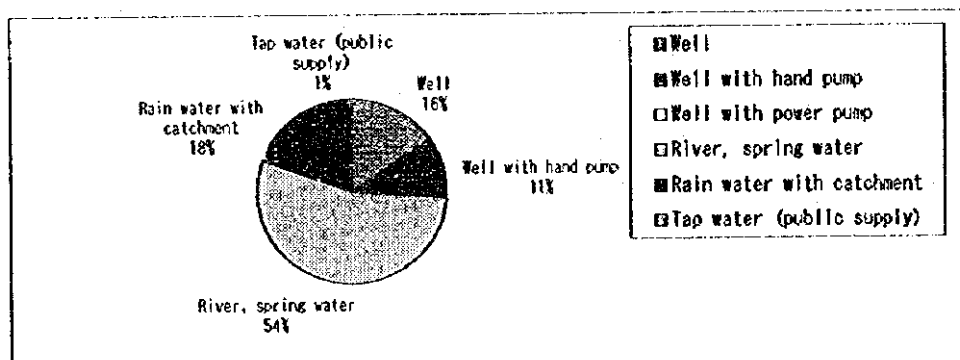
Q1-2 Employment



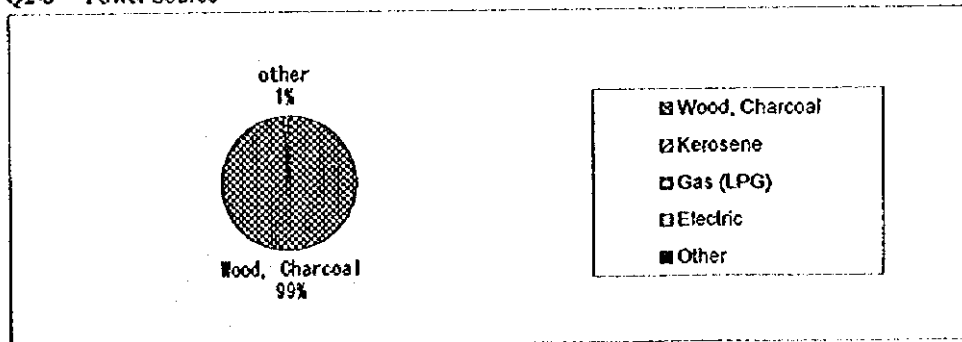
Q2-1 Diffusion Rate of Electricity

30%

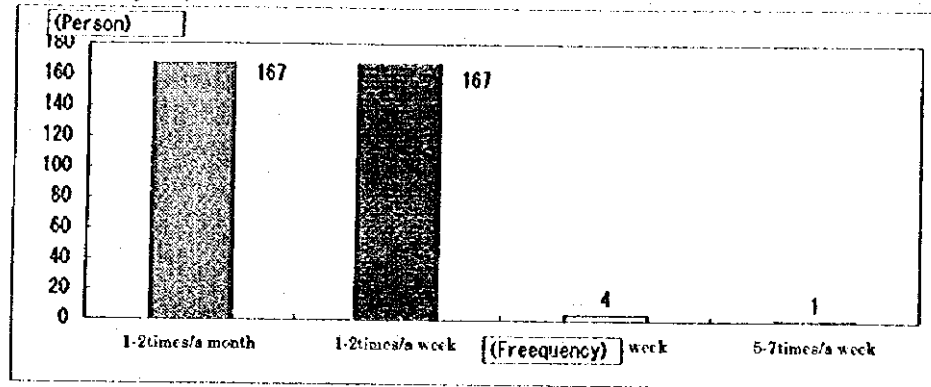
Q2-2 Water Source



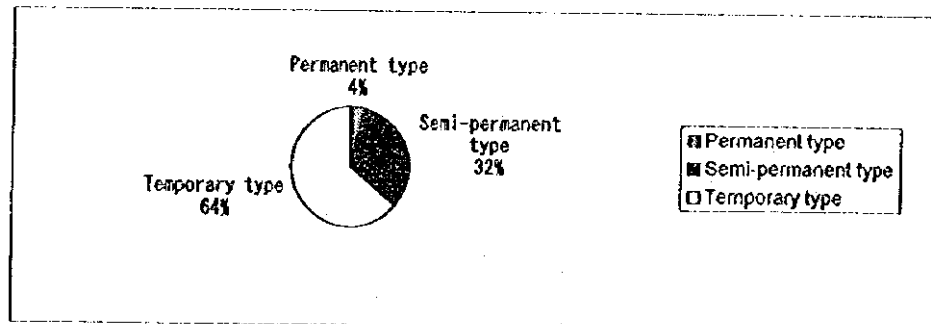
Q2-3 Power Source



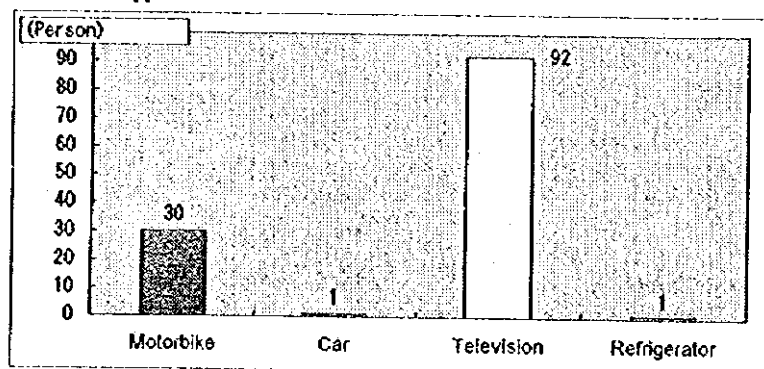
Q2-4 Frequency of meat intake



Q2-5 House type



Q2-6 Car & appliances



Q10 Living expenditure/person (average)

Rp. 377,898

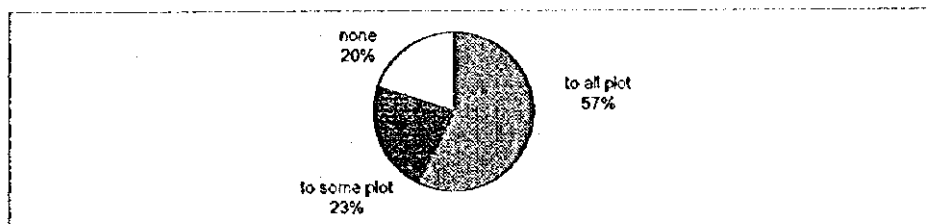
(Q10-2)/(Q1-1)

(15.13% of average total income)

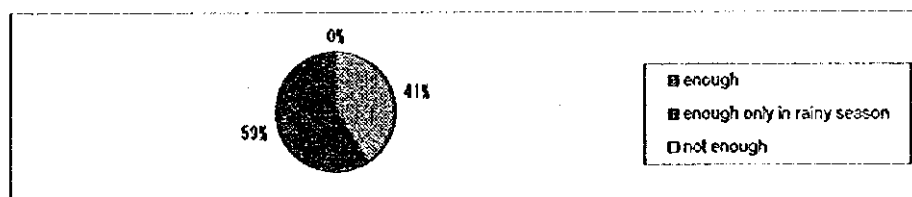
FARMING CONDITIONS

Province No.
4

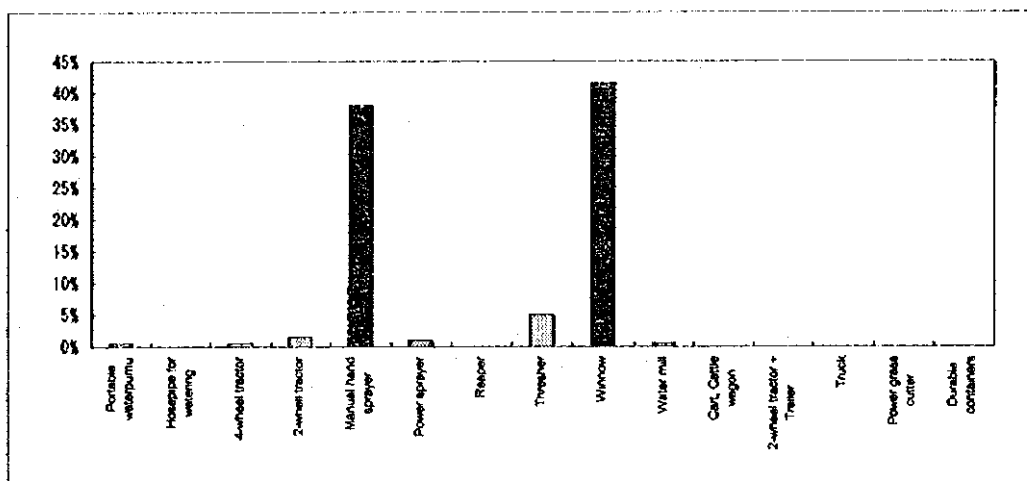
Q5-1 Access Road to Plots



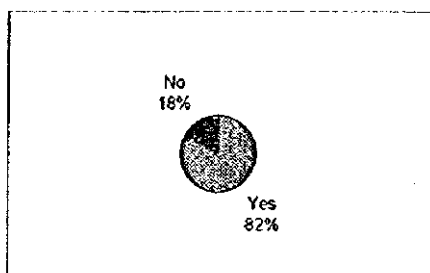
Q5-2 Irrigation Water



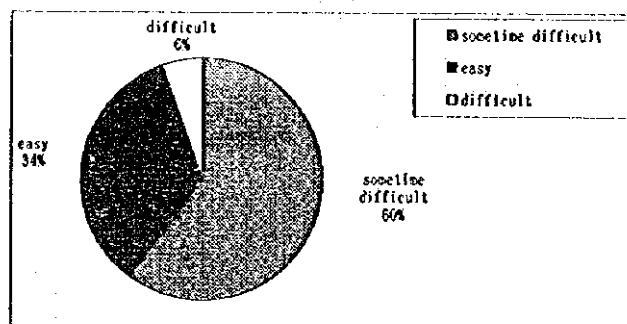
Q6-1 Equipment



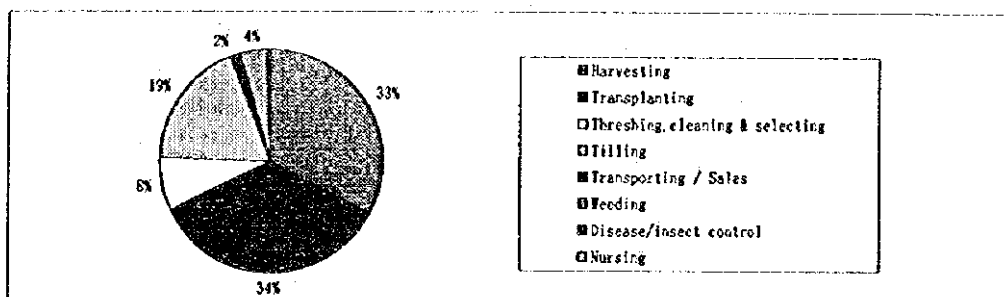
Q8-1 Use of wage worker



Q8-2 Difficulty of finding workers

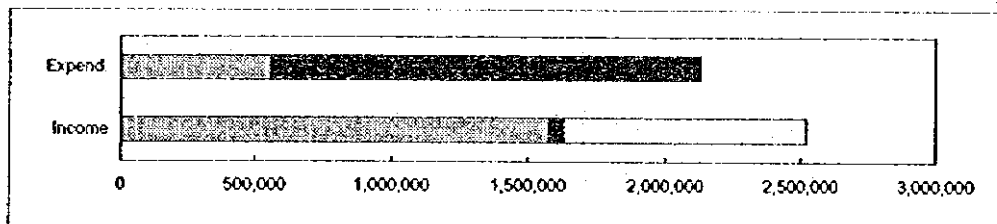


Q8-3 Objectives of using workers

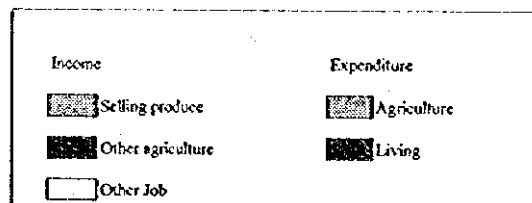


Q9 Income & Expenditure

Q10



	Sales of produce	Other agri.	Other job
Income	1,579,621	50,569	892,205
Expend.	560,580	1,568,747	



Province No.

4

Data for Living/Farming Condition

Q1-1 How many people in your family?

men
women
Total

(%)	(av.count)
53%	2.33
47%	2.11
100%	4.44

Q1-2 How many people working for the farming in your family?

- 1 Full time for farming / only farming
- 2 Part time for farming / farming and other jobs
- 3 Not participated / only other jobs
- (4 No employment)

(%)	(count)
59%	525
3%	31
36%	319
1%	12

Q2-1 Do you have (use) electricity in your house?

- a Yes
- b No

(%)	(count)
30%	59
70%	136

Q2-2 How do you get water for house use?

- a Well
- b Well (with hand pump)
- c Well (with power pump)
- d River (include spring water)
- e Rain (with water catchment)
- f Tap water (public water supply)

(%)	(count)
16%	31
11%	21
0%	0
55%	109
19%	38
1%	1

Q2-3 What kind of power source do you use for cooking?

- a Wood, charcoal
- b Kerosene
- c Gas (LPG)
- d Electric
- e Other

(%)	(count)
99%	197
1%	2
0%	0
0%	0
0%	0

Q2-4 How often do you eat meat?

- a 1 - 2 times in a month (eat seldom)
- b 1 - 2 times in a week (eat sometimes)
- c 3 - 4 times in a week (eat every other day)
- d 5 - 7 times in a week (eat almost every day)

(%)	(count)
87%	167
10%	19
2%	4
1%	1

Q2-5 Type of house

- a Permanent type (brick wall, ceramic roof, cement floor)
- b Semi-permanent type (wood wall, ceramic roof, cement floor or ground)
- c Temporary type (any type other than a, b)

(%)	(count)
4%	7
32%	63
64%	124

Q2-6 Do you have the goods mentioned below? (%=each answer/200)

- a Motorbike
- b Car(4-wheel, 3-wheel)
- c Television
- d Refrigerator

(%)	(count)
15%	30
1%	1
46%	92
1%	1

Q5-1 Do you have the access road to your plots which has enough width for hand-tractor (min. 1.5 m width) ?

- a Yes, there are roads to all plots
- b There are roads to some plots
- c No, there is no access road at all

(%)	(count)
58%	110
23%	43
20%	38

Q5-2 Do you have enough irrigation water for farming in your field ?

- a Enough supply in both dry and rainy season
- b Enough supply in rainy season but not enough in dry season
- c Not enough supply in neither rainy nor dry season

(%)	(count)
41%	78
59%	113
0%	0

Q6-1 What kind of equipment do you have? (%=each answer/200)

	(%)	(count)
a Portable water pump	1%	1
b Hosepipe for irrigation	0%	0
c 4-wheel tractor	1%	1
d 2-wheel tractor	2%	3
e Manual hand sprayer	38%	76
f Power sprayer	1%	2
g Reaper	0%	0
h Thresher	5%	10

- i Winnow
- j Water mill
- k Cart, Cattle wagon
- l 2-wheel hand tractor + Trailer
- m Truck (3-wheel,4-wheel)
- n Grass cutter for weeding
- o Durable container for handling

(%)	(count)
42%	83
1%	1
0%	0
0%	0
0%	0
0%	0
0%	0

Q8-1 Do you use wage workers (laborer paid with money and/or produce) ?

- a Yes
- b No

(%)	(count)
82%	162
18%	35

Q8-2 Is it difficult to find workers ?

- a easy
- b sometimes difficult
- c always difficult

(%)	(count)
34%	55
60%	97
6%	9

Q8-3 What are your objectives of using workers? (%=each answer/total nos. of answer)

- a Tilling
- b Transplanting
- c Weeding
- d Disease/insect control
- e Harvesting
- f Threshing, cleaning & selecting

(%)	(count)
19%	82
35%	155
4%	16
0%	2
33%	144
8%	34

- g Nursing
- h Transporting / Sales
- i Others

(%)	(count)
0%	1
2%	7
0%	0

Q9/Q10 Income/Expenditure

	Sales of produce	Other agri.	Other job
Income	1,579,621	50,569	892,203
Expend	560,580	1,568,747	

Crop Summary for South Kalimantan

Crop	Count	Farmer %	Av. ha	Av. Harvest (kg)	Yield (Kg/ha)	Av. Sale (kg)	Sale %	PHVst. %
Paddy	199	99.5%	1.43	3,045	2,135.5	2,148	70.5%	63.7%
Coconut *	22	11.0%	0.80	683	855.9	614	89.9%	0.0%
Orange	10	5.0%	0.62	3,844	6,177.4	3,524	91.7%	10.0%
Cassava	7	3.5%	0.25	3,029	12,254.3	2,600	85.8%	14.3%
Peanut	4	2.0%	0.18	124	678.1	96	77.8%	50.0%
Vegetable	4	2.0%	0.09	253	2,729.7	228	90.1%	0.0%
Banana	2	1.0%	0.30	180	600.0	175	97.2%	50.0%
Mung bean	2	1.0%	0.50	350	700.0	350	100.0%	50.0%
Rambutan	1	0.5%	0.50	7,000	14,000.0	7,000	100.0%	0.0%
Tangerine	1	0.5%	0.30	1,200	4,000.0	1,200	100.0%	0.0%

Remark : * Harvest, Yield = unit

PHVst. % (Post-harvest %) is % of farmers applying post-harvest treatment for the crop.

Province No.
4

Q1 Major problems for growing crops and feeding animal

- | | | |
|---|-----|--|
| c | 27% | Damage by Insect, disease, rodent, bird, animals |
| d | 23% | Too much production cost (seed, fertilizer, water fee, feed, etc.) |
| b | 22% | Irrigation water (shortage, flood, etc.) |
| f | 7% | Other problems caused by natural environment of region |
| a | 13% | Poor soil fertility |
| g | 1% | I don't know what is my problem / I feel no problem |
| e | 6% | Bad seed quality, difficult to get good seed |

Q2 Major problems for marketing farm produce

- | | | |
|---|-----|--|
| a | 24% | Cheap selling price |
| d | 25% | Middle-man (broker, wholesaler) who have capital keep the selling price low. |
| g | 27% | Seasonal fluctuation of selling price (unstable selling price) |
| e | 3% | Unable to do the proper treatment before selling (treatment = drying, cleaning, grading, sorting, packing) |
| b | 9% | Quality does not meet market requirement and can't sell all the produce |
| f | 2% | I don't know what is my problem / I feel no problem |
| h | 4% | Deterioration and/or Damage by insect/disease/animal after harvesting |
| c | 7% | No transportation means to the market or collection point |

Q3 Idea for increasing income

- | | | |
|---|-----|---|
| b | 34% | To expand / enlarge the farm scale |
| e | 10% | To add the value to the produce by processing |
| d | 6% | To change the marketing method |
| c | 46% | To introduce the new crops / animals |
| f | 1% | No idea for increasing income |
| a | 2% | Satisfied with the present income level |

Q3-1 Idea to expand / enlarge farm scale

- | | | |
|---|-----|--|
| a | 48% | Purchase the land |
| b | 27% | Lease the land |
| d | 16% | Other |
| c | 9% | Cooperate with other farmer(s) / cooperative |

Q3-2 Kinds of crops / animals to introduce

- | | | |
|---|-----|--------------------------|
| a | 30% | Rice |
| g | 16% | Poultry |
| b | 3% | Palawija |
| k | 5% | Fish |
| c | 3% | Vegetable |
| d | 13% | Fruit |
| l | 5% | Estate crops |
| m | 4% | Other |
| i | 15% | Cattle / meat |
| f | 6% | Sheep, goat |
| e | 0% | Pig |
| h | 0% | Cattle / milk |
| j | 0% | Flower, ornamental plant |

Q3-3 Problem or worry for expanding farm scale or introducing new crops / animals

- | | | |
|---|-----|----------------------------------|
| a | 90% | Capital |
| b | 2% | Skill / technique for production |
| c | 1% | Marketing of produce |
| d | 7% | Other |

Q3-4 Idea of improving marketing channel

- | | | |
|---|-----|--|
| b | 51% | Sell to intermediates at the farm |
| d | 10% | Sell to the processors directly |
| e | 5% | Cooperative or cooperate with other farmers |
| a | 29% | Sell to consumers directly at the market |
| c | 4% | Sell to whole seller / retailer directly at the market |
| f | 0% | Other |

Q4 Idea of improving conditions of farm field

c	25%	Rehabilitate irrigation canal
a	22%	Improve/make access road
f	10%	Enlarge / expand field
d	23%	Improve drainage
b	16%	Make irrigation canal
e	3%	Install irrigation pump
g	1%	Other

Q5 Agricultural practice for which machine / equipment are necessary

a	39%	Tilling
c	21%	Harvesting
b	9%	Transplanting
f	4%	Transporting
e	10%	Drying
d	17%	Threshing
i	1%	Other
g	0%	Feeding animal
h	0%	Milking

Q6-1 Knowledge of Official Credit Service

b	79%	Yes, I know.
a	21%	No, I don't know.

Q6-2 Experience of receiving loan from the Official Credit Service

b	48%	Yes
a	52%	No

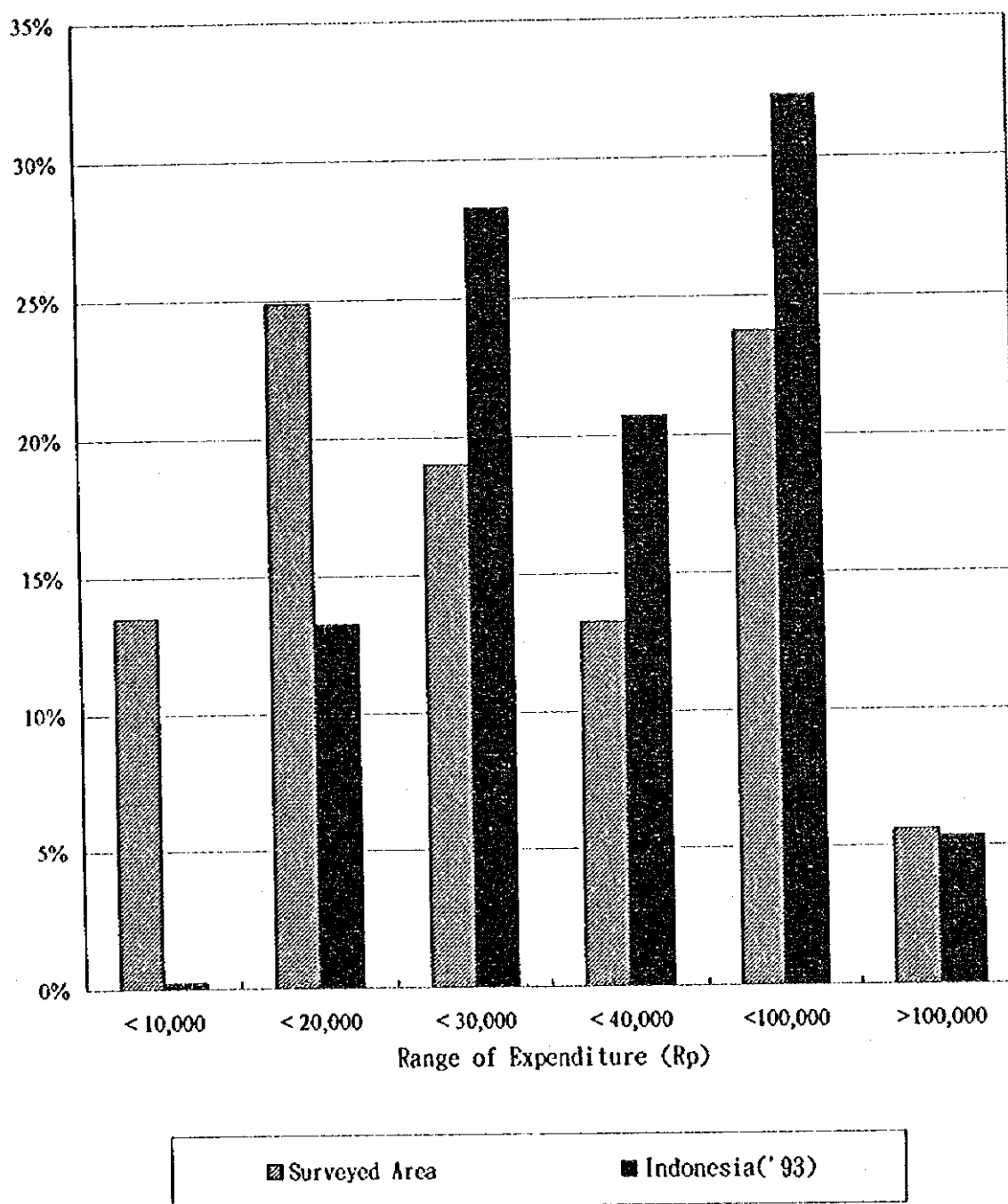
Q6-3 Request to Official Credit Service

d	25%	Simplify application procedure
b	27%	Lower interest
a	20%	Raise limitation of debt amount
c	7%	Extend term
f	6%	No opinion
g	2%	No request, being satisfied with the present service
e	12%	Place bank/institute more closer to village

Q7 Request to Agricultural Extension Services

b	30%	Intensify the door to door technical service (visit more frequently)
d	12%	Supply of information related to the cropping (new variety, market trend)
h	24%	Increase the variety of demonstration plots (i.e: mechanization, vegetable growing, estate crops, etc.)
c	10%	Teach about the know-how of farm management / operation
c	18%	Improve the skill / knowledge of extension worker
f	4%	Supply of market price information
g	0%	Teach about the official credit service
i	0%	Other
a	2%	No request

**Distribution of Farm Household
by Monthly Expenditure**



Distribution of Farm Household by Monthly Expenditure for Living per capita
(surveyed area/Indonesia)

APPENDIX F: LIVESTOCK

**THE STUDY
ON
THE THIRD UMBRELLA COOPERATION
FOR INTEGRATED AGRICULTURAL AND RURAL DEVELOPMENT
IN
THE REPUBLIC OF INDONESIA**

DRAFT FINAL REPORT

APPENDIX F : LIVESTOCK

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Appendix F : Livestock

F.1 INTRODUCTION

Indonesia is an agricultural country, thus agriculture (food crops, livestock and fisheries and forestry) is still the most important sector of its economy. During 1992, agricultural sector contributed about 19.18 % of National Gross Domestic Product (GDP) and livestock sub sector contributed about 2.21 % of National and 11.52 % of Agriculture of GDP. The country commenced its second 25 year plan (PJP II) on April 1, 1994 and is also in its sixth five-year development plan (Pelita VI). The plan predicts that livestock production will increase its contribution to GDP at an annual rate of 6.4 %, the highest among all sectors of agriculture.

F.1.1 Livestock Population

The livestock sub-sector provides almost all the domestic consumption of meat and egg, and the part of milk. This sector also provides draft animals for agriculture and transport, sustain a domestic leather industry, provides additional hide and skin for export, meets a considerable portion of fertilizer requirement. Since 1969, livestock development has made a significant progress. Livestock population and production has increased rapidly to meet the increasing demand in livestock products consumption. The time series data on the livestock and poultry population in Table F.1.1. shown diagrammatically in Figure F.1. based on 1984 index 100, indicate a significant growth is poultry. Large scale broiler industries were introduced at the beginning of 1988 when the poultry population growth rate was about 22 %.

F.1.2 Livestock Production

In general, livestock products increased steadily from 1969 - 1993. Increase in livestock production during these years appears in Table F.1.2. Local meat production is sufficient for local requirement, a small amount of high quality beef was imported to fulfill the requirement of international hotels and restaurants. The quantity of meat being imported was about 10.1 thousand tons or 0.73 % of national production in 1993. In the same time, egg production has also increased. Commercial layers eggs increased its share from 7.3 % (1969) to 59.8 % (1993). Eggs from native chicken dropped from 53.5 % to 18.3 % and duck from 39.2 % to 21.8 %. Egg production is more than sufficient to

supply local demand and even the potential for export. Since 1990, poultry meat is exported to Japan and its volume has been in increase from then.

Milk production has increased rapidly through some efforts, i.e., by importation of high quality breeding stock, improved management and Artificial Insemination program. Therefore, the ratio of imported to domestic milk production declined from 20:1 in 1979 to 1.4:1 in 1993.

Until recently, Indonesia is still importing some livestock products such as milk and high quality beef as well as breeding stocks, feeder steers and other livestock by-products.

Indonesia exported some livestock products such as day old chick, chicken meat and eggs, but competition from neighboring countries is on the rise.

F.1.3 Animal Resources

Livestock are spread throughout all regions of the country, with concentrations of certain farming systems in particular areas because of marketing and/or agro-climatic reasons. The geographic distribution of country's animal resources are uneven (Table F.1.3.). The agricultural area is divided into heavily populated Jawa island and lightly populated other islands. Dairy cattle population and commercial poultry population in Java island account for about 90 % of the country's population and milk and egg/poultry meat output. Buffalo and local cattle are used for draught power, and beef was considered an incidental by-products of the draught system. Native chicken and ducks are traditionally raised throughout the country. The commercial egg and chicken meat production are well developed in cities and around industrial zones. Only private farmers and households keep horses, goats and sheep. The importance of these animals could be bigger than their present role in the livestock sector.

The dairy industry is receiving increasing attention from the government. In November 1985, a policy was instituted that requires a processor or bottler to purchase one ton of domestically produced milk in order to obtain the right to import two tons of fluid milk equivalent in the form of the dried milk powder.

Pig farming in Indonesia may seems to be strange, in view of the fact that 90 % of the country's inhabitants are devout Moslems and are therefore forbidden to eat pork. But Indonesia does have numerous pig farms serving its minority groups and also there are large projects to produce pork for export to Singapore. Close proximity to Singapore is the main attribute of a new project developed in Bulan, next to Batam island on

Singapore's southern tip.

F.1.4 Meat consumption

In 1993, meat supply in Indonesia was 1,382.6 thousand tons, of which 309 thousand tons (or 22.5 %) was beef. The composition structure of meat production is : poultry - 54 %, beef - 22.5 %, buffalo meat - 3.6 %, goat meat-5.6 %, sheep meat-3 % and pork - 11 %. Imported meat (mainly beef) comprised of 7 % or 10.1 thousand tons in 1993. The projected increase in meat consumption is 5.5 % per year because of;

- increase in the population,
- increase in per capita income,
- tourism program,
- educational program.

However, it is estimated that local meat production will increase by 3.9 % per year. That's why meat importation is still necessary and for this reason, the government through the deregulation measures, issued on May, 1990 and June, 1991, supported investment activities in Agribusiness system. With increasing demands for beef, it is expected that importation of both beef and feeder steers in large volumes would continue unless something is done to augment the local beef cattle industry.

F.1.5 Institutional Support Services

F.1.5.1 Animal Health

The veterinary service is a state owned network in the country, with a pyramidal organizational system. Disease surveillance is mainly implemented through a network of animal health laboratories which consist of

- a. Disease Investigation Centers (DIC) - 7 units
 - 3 units in Sumatera (Medan, Bukittinggi, Lampung)
 - 1 unit in Java (Yogyakarta)
 - 1 unit in Sulawesi (Maros)
 - 1 unit in Kalimantan (Banjarbaru)
 - 1 unit in Eastern Island (Denpasar)

- b. Animal Health Laboratories type B/C (29 units of Type B, 34 units of Type C)
- c. Provincial Livestock Services.
- d. Vaccine and Biological Production Center (PUSVETMA, Surabaya)
- e. Animal Drug Assay Laboratory (Gunung Sindur, Bogor)

In October 1990, Indonesia has been internationally declared as free from Foot and Mouth Disease (FMD). But there are a variety of livestock and poultry diseases in Indonesia. The prevailing diseases are Tick Borne Disease, internal parasitism, epidemic diseases such as Anthrax, Black Leg and etc., which are the cause of low livestock production in the country. Some of the diseases control measures practiced in the country are annual vaccination inoculations. Each province has a local veterinary service and small clinics are available in districts. The compulsory vaccinations are carried out by the provincial veterinary services and important vaccinations are free of charge. But lack of sufficient facilities in rural veterinary services are quite evident.

F.1.4.2 Animal Production Support Facilities.

- a. Regional Center for Breeding and Forage Production (BPT-HMT) - 9 units
- b. Artificial Insemination Center (Lembang: Singosari)- 2 units.

F.1.5 Commercial Feed Industry

Indonesian commercial feed manufacturers added a massive 50 % to their combined production capacity during 1994, according to data from the Directorate General of Livestock Services, Ministry of agriculture. These figures show a manufacturing capacity which has been expanded to almost 4.88 million tons per year, compared with 3.25 million tons in 1993 and less than 3 million tons in 1991 and 1992. Historically, two-thirds of the feed mills and of annual feed output in Indonesia have been found on the island of Jawa, especially around the north eastern port of Surabaya. A new feed zone with an estimated capacity of 1 million tons per year has been established close to the western channel separating Jawa from Sumatra, however.

The price of feed in Indonesia is higher than in many of its Asian neighbors. Bag handling, relatively expensive in bound ocean freight, high port charges, and the cost of a dealer network combine to keep feed expensive for Indonesian livestock producers. These factors are likely to change only very slow.

F.2 LIVESTOCK INDUSTRY IN THE WEST JAWA PROVINCE

F.2.1 General

The major activity undertaken by the farmer in the highland area is dairy production. Consistent with Government's priorities, specific attention is given to expansion of the domestic dairy industry. The government backed by institutional support has endeavored promotion of systematic dairy farming and marketing systems, with encouraging success. Even so, some sections in these areas have lagged behind due to various factors, such as insufficiency in better breeding stocks, inadequate pasture and fodder development, absence of modern feeding and management techniques, ineffective disease control programs, ineffective breeding and upgrading programs for dairy production.

The highland area is generally that land with elevation of 300 - 1500 meters. In areas where there exists facilities for milk marketing, milk from cow is becoming an important source of income for small holding farms. In total, nearly one-thirds of the country's dairy cattle are found in the West Jawa Province. The highest cow number is recorded in Bandung district with Garut, Bogor, Kuningan, Sukabumi and Cianjur districts.

(1) Population

On the basis of the annual reports prepared by the provincial office of the livestock services, the West Jawa Province, the population of livestock in 1994 was estimated by districts as shown in Table F.1.4. and 1.4.5. It is estimated that 113,800 heads of dairy cow are reared in the Province corresponding to 32% of the total dairy cows in the country.

(2) Farming Systems

Dairy Cattle

In the West Jawa Province, particularly in the Highland Area, mainly zero grazing systems (cut and carry system) are practiced by small holding farmers, the government organizations and private enterprises. Rather modern dairy farming with Holstein cattle is prevailing in the Highland Area. Now, Bandung district is a leading dairy zone and techniques in West Jawa Province. It is becoming popular especially in mixed farming small holder area. Zero grazing dairy farming systems has gained popularity in areas with high population densities. However, in most districts of Highland Areas, these

systems including pasture and fodder development, disease control program, systematic breeding through artificial insemination (A.I.) and concentrate feed supplementation have been applied to very limited extent. In Highland Areas, managed pasture has been less developed, but fodder crops such as Napier grass, King grass are cultivated.

Beef Cattle

Beef industry is least developed compared to dairy production. A number of government sponsored projects have been instituted to promote the improvement of cattle breeding and of beef production. These projects are primarily based on the utilization of available roughage and by-products. In the Highland Area, beef industry is still in its initial phase with local breeds such as Ongole and their crosses. Most of the slaughter cattle are transported from other provinces.

Problems mostly encountered in small holder operations are inefficient breeding techniques; inadequate feed supply; and lack of inadequate technical support, veterinary, and extension services from the government.

Water Buffalo

Buffalo is traditionally raised by crop farmers. However, the production system is much determined by the of land-man ratio and the availability of grazing land. In West Java Province, buffalo feeding practice is a combination of cut-and-carry system and limited grazing in newly harvested crop areas. Buffalo development program is directed mainly to increase its population, and productive quality in order to improve farmer's income, power supply and meat production. Uncontrolled mating commonly occurs between young bulls and dams in a herd. Usually, young males are more aggressive than old bulls. Most of the active bulls are under 3 years of age. The problem in breeding is that bulls with faster body growth are sold at their young age.

Sheep and Goats

Sheep and goats are also important source of meat for Indonesians. Goats as well as sheep are widely distributed through Indonesia but are heavily concentrated in a few provinces on Jawa. Their population has remained relatively stable over years. At present, the demand of goats meat is high, not only for local consumption but also for export to other countries. They are raised mainly in low and marginal potential areas.

Poultry

There are some large scale hatcheries , egg layers and broilers in the High land area. Broiler farming is unpopular among small holding farmers. The local indigenous birds are still predominant due to their high disease resistance. Egg and meat from the exotic breeds are marketed in most urban centers. It is interesting to note that the growth in the production of native chickens substantially outpaces the growth in human population. This tasty and chewy bird continues to be in demand and typically at premium prices to commercial broilers. This versatile bird perform many other functions including entertainment, speed control on country side roads, transmitter of poultry diseases, diversion for the family dog, insect control and waste management.

(3) Milk Production

Milk yield

The milk yield of cow varies widely by cattle strain and management system. One milking cow produces around 10 - 30 liters per day.

Marketing of Milk

Milk is collected by cooperative societies and delivered to milk processing plants in Jakarta and Bandung. Indomilk Co., (Jakarta) and Ultra Jaya Co., (Bandung) are the main purchasers of milk and allowed to market the processed milk in main urban center of the country.

Milk Prices

An example calculation is as follows where farmers are paid a chilling center price of Rp. 500 - 550 per liter for raw milk (at 3.3% fat and 8.3% Solid-Not-Fat), KUD's resale price to factory is Rp. 700 - 720 per liter, resulting in a retail price of pasteurized milk of Rp. 3,450.00 per liter.(in Jakarta market)

(4) Dairy Cooperative Society (KUD)

Milk producers cooperative societies have increased in numbers and are present in every main milk production districts. Data obtained by the study team from visits to various dairy cooperatives in Bandung district is given in Table F.1.6. The KUD can also be effective entities in the provision of input services. They have daily contact with all their members through the operation of the milk collection service - their principal activity. Their functions include receiving milk from all members twice daily, determining the quantity and composition of each farmer's milk, organizing the

delivery of the milk to the processor and paying the farmer on a regular basis. Milk is collected by cooperatives and its delivery into own bowzers. Cooperatives are in an excellent position to provide a conduit for cattle feed supply, fodder crop promotion, A.I. services, veterinary and animal husbandry, farmer credit, cattle insurance etc.

(5) Artificial Insemination for Cattle

Artificial Insemination (A.I.) is a major mean for improving cattle and buffaloes production. Frozen semen provided by National Lembang A.I. Center have been decreasing in recent years compared with main dairy production area of East Jawa Province where another National A.I. Center exists. Table below shows the number of inseminations by Jawa Island in the past few years. A.I. is free of charge.

Realization of Artificial Insemination (in dosis)					
Province	1989	1990	1991	1992	1993
West Jawa	36,162	29,363	168,855	140,233	109,945
Central Jawa	63,839	111,058	236,346	352,412	334,973
East Jawa	133,625	185,026	418,747	481,229	709,951

Source: Buku Statistik Peternakan, 1994.

(6) Disease Control

Government's present investment in infrastructure facilities and personnel to support nation-wide disease control programs is not being effectively utilized, while major opportunities exist in cost effective livestock development from the control of specifically identified livestock diseases. In the Province, there are many animal health institutions but lack of sufficient facilities is quite evident and are not operational due to a variety of reasons, such as 1) lack of basic diagnostic equipment and vehicles, 2) ineffective management standard and testing services.

Animal Health Institutions in the Province

Classification	Location
DIC Type B	Bandung, Cirebon
DIC Type C	Cirebon, Tasikumalaya, Karawang
Animal Health Post	Bandung, Kuningan, Cianjur, Sukabumi, Bogor Sumedang, Majalengka, Cirebon, Indramayu, Garut, Tasikumalaya Ciamis. Bekasi, Serang, Tangerang

Notes : * DIC=Disease Investigation Center
Block letters existing in Highland Area.

Main diseases found in this Region are Brucellosis, Haemorrhagic Septicaemia, Anthrax, Mastitis, Milk Fever, Tympany and Diarrhea in calves.

(7) Slaughterhouses

Most meat livestock are slaughtered in small authorized abattoirs located near to major markets. There are approximately 185 registered slaughterhouses in the Province. Unclean areas, carcasses contamination with rumen and intestinal contents are common features. Typically there is no proper waste disposal system and the wastes are commonly dumped with sewage materials, only a short distance away from the slaughterhouses where it can breed flies and emit odors, or worse still, is dumped in passing streams or nearby swamps. It is not only the environment destruction by this type of action which is of concern, but also there is the chance that disease will spread along the course of the waterway. As most of the meat is sold fresh, and then cooked well soon after, the lack of cleanliness and poor quality is of little consequence to the consumer. It is among the growing supermarket shoppers who buy prepackaged meat and small goods which are prepared and kept under refrigeration where the effects of poor quality meat become an issue.

F.2.2 Constraints and Prospects

(1) Constraints

Constraints to the livestock development in the Highland Area may be summarized as follows:

- 1) There is very low level utilization of high energy feeds such as by-products of cereals, root crops and miscellaneous concentrates which are abundant in the Region.
- 2) Ticks and other external parasites which cause high losses to cattle, especially exotic breeds.
- 3) The management of livestock feeding varies widely due to difference in KUD's extension services. There is a great need to develop and popularize particular systems for grass chopping and special tools.
- 4) There is need to establish a quality control system for livestock products. This will create an incentive for the farmers to raise quality livestock products.
- 5) Marketing and transporting systems of various livestock products except fresh milk, is not well organized.

6) **Shortage of Minerals, Trace Elements and Vitamins in Feeds.**

There is little domestic production of these important feed supplements, therefore the KUD's feed mills must rely on imports. At present, very little amount of premix are used. Animal feeds are generally deficient in phosphor, trace elements and vitamin A, D and E.

7) **Inadequate Veterinary and Extension Services.**

The Government's veterinary and extension services for farm animals are inadequate due to lack of facilities, trained personnel, funds, etc.

(2) Prospects

The following advantages are recognized for the future livestock development in this Region.

- 1) High marketability of livestock products in whole Indonesia as well as neighboring countries.
- 2) Good climate for dairy cattle and other improved livestock breeds that to be introduced.
- 3) High yield potential for grass production, if proper management are practiced, and
- 4) High availability of raw materials for livestock feed such as rice straw, grain brans, soybean curd waste, and agricultural food by-products.

F.2.3 Development Strategy

Based on the analysis of present situation described in the previous sections and in line with the National policy, strategy for livestock development in the Region is drawn up in order to overcome the constraints by effectively capitalizing the advantages summarized above. It consists of the following:

- 1) To improve the overall productivity of livestock by making available sufficient number of high quality breeding stock;
- 2) To organize and improve stock raising activities of small scale farmers through demonstration effects of model farms as well as provision of training and technical extension services.
- 3) To promote livestock feeding systems through the improvement of fodder crop production and pasture grasses, the production of supplementary feed and the

encouragement of home grown protein crops; and

- 4) To establish more widely intensive systems of stock raising, especially in high population density areas.

In view of the present situation in the Region and the recent policy emphasis, the strategy presented above should aim firstly at increasing milk production and secondly at increasing meat (beef) production. Other objectives are expected to be attained to a certain extent in the course of fulfilling these more important objectives.

Table F.1.1 Livestock and Poultry Population 1974-1993

(Unit : '000 head)

Year	Cattle		Buffalo	Goat	Sheep	Pig	Horse	Chicken			Duck
	Dairy	Beef						Native	Layer	Broiler	
1974	86	6,380	2,415	6,517	3,403	2,906	600	98,650	3,450	-	13,620
1975	90	6,242	2,432	6,315	3,374	2,707	627	94,572	3,903	-	14,123
1976	87	6,237	2,284	6,904	3,603	2,947	631	97,504	4,878	-	15,182
1977	91	6,217	2,292	7,232	3,864	2,979	659	101,686	5,807	-	16,032
1978	93	6,330	2,312	8,051	3,611	2,902	615	108,916	6,071	-	16,032
1979	94	6,362	2,432	7,659	4,071	3,183	596	114,350	7,007	-	18,689
1980	103	6,440	2,457	7,691	4,124	3,155	616	126,310	22,940	-	21,078
1981	113	6,516	2,488	7,790	4,177	3,364	637	132,878	24,568	25,462	18,689
1982	140	5,594	2,513	7,891	4,231	3,587	658	139,787	26,312	28,110	22,420
1983	198	8,894	2,398	10,970	4,789	4,248	527	159,462	28,102	31,033	23,861
1984	203	9,236	2,743	9,025	4,698	5,112	659	166,815	29,559	110,580	24,694
1985	208	9,318	3,245	9,629	4,885	5,560	668	155,627	31,875	143,657	23,870
1986	222	9,432	3,496	10,783	5,284	6,216	715	162,991	38,689	173,795	27,002
1987	233	9,510	3,296	10,392	5,354	6,339	658	168,405	39,968	218,183	26,025
1988	263	9,776	3,194	10,606	5,825	6,484	675	182,879	38,413	227,044	25,080
1989	288	10,094	3,224	10,996	5,910	6,936	683	191,433	40,452	262,918	24,135
1990	294	10,410	3,335	11,298	6,006	7,136	683	201,366	43,185	326,612	25,553
1991	306	10,667	3,311	11,484	6,108	7,612	695	208,966	46,885	407,908	25,369
1992	312	11,211	3,342	12,062	6,235	8,135	678	222,530	54,146	459,097	27,342
1993	351	11,356	3,370	11,502	6,697	8,635	653	259,321	54,306	526,960	28,577

Source: Buku Statistik Peternakan (Statistical Book on Livestock) 1994, Direktorat Jenderal Peternakan.

Table F.1.2 Livestock Products Production and Supply between 1974 and 1993

(Unit : '000 tons)

Year	Meat			Egg			Milk		
	Production	Import	Supply	Production	Import	Supply	Production	Import	Supply
1974	403.1	2.1	405.2	57.4	0.1	57.5	49.5	200.4	249.9
1975	435.0	1.0	436.0	65.5	0.1	65.6	44.5	209.7	254.2
1976	448.7	1.4	450.1	69.3	0.1	69.4	49.2	328.6	377.8
1977	467.7	1.3	469.0	110.7	0.1	110.8	52.8	365.2	418.0
1978	474.6	1.7	476.3	122.7	0.1	122.8	54.2	440.3	494.5
1979	486.5	1.6	488.1	134.1	0.2	134.3	58.5	474.2	532.7
1980	570.8	1.6	572.4	207.7	0.1	207.8	68.6	594.3	662.9
1981	596.0	2.2	598.2	224.6	0.2	224.8	75.1	521.1	596.2
1982	628.6	2.6	631.2	242.9	0.2	243.1	102.1	536.0	638.1
1983	650.2	2.9	653.1	259.1	0.1	259.2	124.5	393.7	518.2
1984	742.2	2.2	744.4	293.6	1.5	295.1	160.5	462.2	622.8
1985	808.4	1.1	809.5	307.4	0.0	307.4	188.6	353.1	541.7
1986	879.0	1.5	880.5	362.4	0.0	362.4	179.2	392.7	571.9
1987	895.5	1.7	897.2	374.4	0.0	374.4	205.5	452.7	658.2
1988	937.0	1.6	938.6	364.5	0.0	364.5	236.8	497.8	734.6
1989	971.1	2.0	973.1	376.6	0.0	376.6	295.9	365.2	661.1
1990	1,027.7	4.0	1,031.7	418.2	0.0	418.2	317.4	304.0	621.4
1991	1,099.2	6.0	1,105.2	442.6	0.0	442.6	299.2	507.8	807.0
1992	1,239.2	12.0	1,251.2	502.9	0.0	502.9	295.7	514.4	810.1
1993	1,372.5	10.1	1,382.6	515.7	0.0	515.7	335.4	487.9	823.3

Source: Buku Statistik Peternakan (Statistical Book on Livestock), 1994, Direktorat Jenderal Peternakan.

Table F.1.3 Livestock and Poultry Distribution by Province in Indonesia (1993)

Province	Beef Cattle	Dairy Cattle	Buffalo	Goats	Pig	N. Chicken	Layer	Broiler	Duck
D.I. Aceh	546,915	373	388,862	484,368	1,732	10,656,305	83,307	86,325	2,723,090
Sumatra Utara	121,509	7,833	231,836	541,055	2,268,525	13,577,547	2,733,144	4,808,235	1,403,430
Sumatra Barat	404,024	2,825	207,519	303,883	19,217	9,819,455	1,730,802	780,706	1,717,877
Riau	117,212	-	42,665	178,995	45,045	3,048,692	641,935	3,789,170	318,267
Jambi	113,584	32	76,236	101,036	11,779	3,335,000	202,000	1,211,006	405,000
Bengkulu	95,677	131	96,623	149,750	1,059	4,065,585	37,405	419,021	650,520
Sumatra Selatan	439,913	183	138,212	528,351	179,179	10,898,999	799,000	878,999	1,610,351
Lampung	283,004	168	36,667	329,381	79,154	11,399,391	2,034,411	1,208,799	430,288
TOTAL SUMATRA	2,121,838	11,545	1,218,620	2,616,819	2,605,690	66,800,974	8,262,004	13,182,261	9,258,823
DKI Jakarta	-	5,537	652	7,483	44,021	252,326	30,100	312,000	8,850
Jawa Barat	184,363	113,803	529,106	1,902,353	49,348	32,499,328	12,165,861	17,555,620	3,463,529
Jawa Tengah	1,183,721	89,080	251,741	2,562,366	145,246	30,984,365	4,926,238	9,320,508	3,409,140
D.I. Yogyakarta	191,040	2,924	10,687	273,593	10,456	4,977,529	1,996,913	1,028,596	219,271
Jawa Timur	3,160,000	127,000	177,000	1,647,070	83,000	31,334,727	14,447,447	5,320,841	2,140,153
TOTAL JAWA	4,719,124	338,344	969,186	6,392,865	332,071	100,048,275	33,566,559	33,537,565	9,240,943
Kalimantan Barat	141,250	188	7,310	63,815	655,600	2,829,500	1,176,900	882,567	362,200
Kalimantan Tengah	52,967	-	9,181	17,268	142,705	1,872,827	84,756	269,442	157,189
Kalimantan Selatan	135,616	79	49,669	58,845	12,922	4,512,092	432,688	949,641	2,769,079
Kalimantan Timur	73,178	110	22,437	59,097	88,220	3,157,600	346,300	1,593,900	206,500
TOTAL KALIMANTAN	403,011	377	88,597	199,025	899,447	12,372,019	2,040,644	3,695,550	3,494,968
Sulawesi Utara	270,372	203	5,822	102,122	472,974	1,801,165	800,103	1,234,066	354,078
Sulawesi Tengah	378,676	-	41,551	119,953	207,008	4,492,525	196,183	6,750	229,076
Sulawesi Selatan	1,245,595	-	544,655	653,498	408,325	18,181,270	2,215,480	2,292,853	3,847,451
Sulawesi Tenggara	299,100	-	14,539	109,794	15,767	4,830,663	26,437	-	224,382
TOTAL SULAWESI	2,193,743	203	606,567	985,367	1,104,074	29,305,623	3,238,203	3,533,669	4,654,987
Bali	483,687	89	10,818	112,903	1,090,912	5,986,933	1,354,772	1,121,948	616,097
Nusatenggara Barat	425,246	-	214,008	266,854	24,087	4,525,400	179,601	-	58,239
Nusatenggara Timur	767,704	-	187,105	544,409	1,453,558	6,427,265	397,705	99,054	167,444
Maluku	93,419	14	21,070	192,104	96,932	1,699,182	92,987	611,355	70,670
Irian Jaya	54,951	157	758	65,090	617,877	1,503,042	207,915	673,800	53,086
Timor Timur	93,153	-	52,940	126,410	410,183	612,930	21,396	329,240	41,387

Source: Buku Statistika Peternakan (Statistical Book on Livestock), 1994. Direktorat Jenderal Peternakan.

Table F.2.1 Livestock and Poultry Numbers in the West Java Province by Districts (1994/1995)

(head/unity)												
	Beef Cattle		Dairy Cattle		Buffalo		Horses		Goats		Sheep	
Rank	Districts	Number	Districts	Number	Districts	Number	Districts	Numbers	Districts	Numbers	Districts	Number
1	Sumedang	29,721	Bandung	78,837	Lebak	73,698	Bandung	4,660	Pandeglang	227,749	Bandung	383,686
2	Camis	28,319	Garut	16,623	Serang	70,554	Garut	1,220	Ciamis	211,042	Garut	276,816
3	Bogor	20,485	Bogor	6,545	Pandeglang	48,239	Cianjur	1,140	Lebak	194,125	Ciamis	253,498
4	Tasikmalaya	16,115	Kuningan	3,316	Tangerang	36,689	Sumedang	634	Indramayu	161,362	Bogor	211,549
5	Sukabumi	16,078	Sukabumi	2,917	Bogor	34,494	Tasikmalaya	633	Bogor	143,322	Indramayu	206,177
6	Purwakarta	13,660	Cianjur	2,031	Cianjur	33,033	Kuningan	630	Serang	118,270	Majalengka	183,563
7	Subang	12,532	Sumedang	1,943	Tasikmalaya	32,269	Serang	598	Bandung	102,759	Pandeglang	183,064
8	Bekasi	10,153	Tasikmalaya	1,259	Ciamis	29,794	Cirebon	568	Cianjur	98,629	Sumedang	179,615
9	Karawang	9,142	Majalenga	520	Sukabumi	24,314	Bogor	478	Sukabumi	86,831	Kuningan	179,132
10	Tangerang	7,817	Tangerang	222	Bandung	19,260	Ciamis	372	Garut	74,313	Tasikmalaya	178,703
11	Kuningan	7,744	Subang	174	Purwakarta	18,679	Sukabumi	291	Sumedang	73,201	Sukabumi	161,633
12	Indramayu	5,206	Cireben	153	Indramayu	18,639	Purwakarta	280	Tasikmalaya	69,207	Cianjur	155,688
13	Cianjur	3,750	Bekasi	64	Garut	14,343	Tangerang	232	Subang	66,935	Cirebon	150,508
14	Garut	2,856	Serang	53	Subang	13,705	Indramayu	107	Tangerang	55,455	Lebak	148,114
15	Bandung	1,663	Karawang	20	Cirebon	12,657	Pandeglang	93	Bekasi	53,873	Subang	132,502
16	Lebak	704	Purwakarta	4	Sumedang	11,928	Subang	71	Kunlingan	50,621	Karawang	93,082
17	Serang	460	Pandeglang	0	Kuningan	11,534	Karawang	35	Karawang	47,700	Serang	80,874
18	Majalenga	373	Lebak	0	Bekasi	7,460	Lebak	0	Purwakarta	32,236	Purwakarta	67,710
19	Cirebon	110	Ciamis	0	Majalenga	6,495	Bekasi	0	Majalenga	28,114	Bekasi	50,311
20	Pandeglang	8	Indramayu	0	Karawang	4,371	Majalenga	0	Cirebon	18,703	Tangerang	49,430
	Total	186,896	Total	114,681	Total	522,155	Total	12,042	Total	1,914,447	Total	3,325,655

Rank	Pigs		Native Chicken		Layer Chicken		Broiler		Duck	
	Districts	Number	District	Number	District	Number	District	Number	District	Number
1	Tangerang	33,208	Ciamis	5,325,371	Bogor	5,078,520	Ciamis	4,486,700	Indramayu	997,669
2	Bandung	9,040	Bandung	3,132,191	Tangerang	4,927,339	Bogor	4,295,768	Cirebon	394,697
3	Bogor	2,432	Bogor	2,572,212	Bekasi	994,353	Tangerang	2,991,430	Karawang	248,038
4	Subang	1,317	Tangerang	2,389,032	Sukabumi	776,295	Sukabumi	1,768,404	Bandung	230,115
5	Majalengka	883	Pandeglang	2,336,405	Tasikmalaya	536,780	Serang	1,592,000	Subang	190,601
6	Sumedang	794	Sukabumi	2,008,661	Bandung	277,271	Bandung	1,409,584	Tangerang	182,573
7	Karawang	650	Karawang	1,960,102	Cianjur	224,660	Cianjur	1,205,008	Tasikmalaya	175,325
8	Kuningan	499	Tasikmalaya	1,874,688	Kuningan	145,669	Bekasi	685,211	Serang	158,375
9	Cirebon	417	Bekasi	1,748,551	Cirebon	136,376	Tasikmalaya	621,240	Bogor	214,757
10	Bekasi	409	Indramayu	1,612,021	Serang	122,600	Purwakarta	478,000	Sukabumi	138,324
11	Serang	0	Serang	1,559,110	Sumedang	97,250	Subang	363,000	Lebak	116,519
12	Pandeglang	0	Cirebon	1,556,336	Indramayu	91,836	Kuningan	359,719	Garut	109,857
13	Lebak	0	Lebak	1,487,658	Purwakarta	85,000	Garut	316,950	Ciamis	104,497
14	Sukabumi	0	Garut	1,434,175	Ciamis	79,200	Cirebon	314,842	Bekasi	101,411
15	Cianjur	0	Majalenga	1,124,735	Garut	40,440	Pandeglang	298,890	Majalenga	82,919
16	Garut	0	Cianjur	1,055,496	Majalenga	30,173	Majalenga	266,700	Sumedang	73,915
17	Tasikmalaya	0	Purwakarta	930,196	Karawang	6,650	Karawang	248,038	Cianjur	66,116
18	Ciamis	0	Kuningan	919,290	Subang	4,700	Lebak	220,000	Kuningan	44,672
19	Indramayu	0	Subang	845,325	Pandeglang	0	Indramayu	134,820	Pandeglang	43,704
20	Purwakarta	0	Sumedang	830,125	Lebak	0	Sumedang	132,700	Purwakarta	29,330
	Total	49,649	Total	36,701,680	Total	13,655,112	Total	22,189,004	Total	3,703,414

Source: Laporan Tahunan 1994/1995. DINAS Peternakan Propinsi DTI, Jawa Barat.

Table F.2.2 Dairy Cooperatives and Cattle Numbers in Bandung District, West Jawa, 1996

Co-op(KUD)	Number of Members	Adult Cattle		Growing Cattle		Calves		Grand Total	Milk Production per Day (liters)	(Unit : units)		
		Male	Female Total	Male	Female Total	Male	Female Total					
Cilengkrang	405		879	894	2	144	146	100	275	375	1,415	5,729
Ciwidy	678	3	477	480	0	263	263	74	252	326	1,069	3,880
Pasirjambu	1,791	0	1,591	1,591	0	282	282	122	550	672	2,545	19,434
Soreang	35	0	134	134	0	18	18	13	25	38	190	759
Lembang	2,205	65	6,402	6,467	0	566	566	466	674	1,140	8,173	64,705
Cisarua	2,243	725	3,923	4,648	1,075	1,928	3,003	480	1,300	1,780	9,431	42,523
Pangalengan	7,996	0	11,759	11,759	194	4,566	4,760	778	2,116	2,894	19,413	108,018
Ciparay	396	0	498	498	0	76	76	123	180	303	877	3,850
Cikalongweta	113	22	143	165	28	46	74	9	16	25	264	603
Cimenvan	12	0	44	44	0	0	0	0	16	16	60	200
TOTAL	15,874	830	25,850	26,680	1,299	7,889	9,188	2,165	5,404	7,569	43,437	249,701

Source: DINAS Peternakan, Bandung District, West Jawa. Feb. 1996.

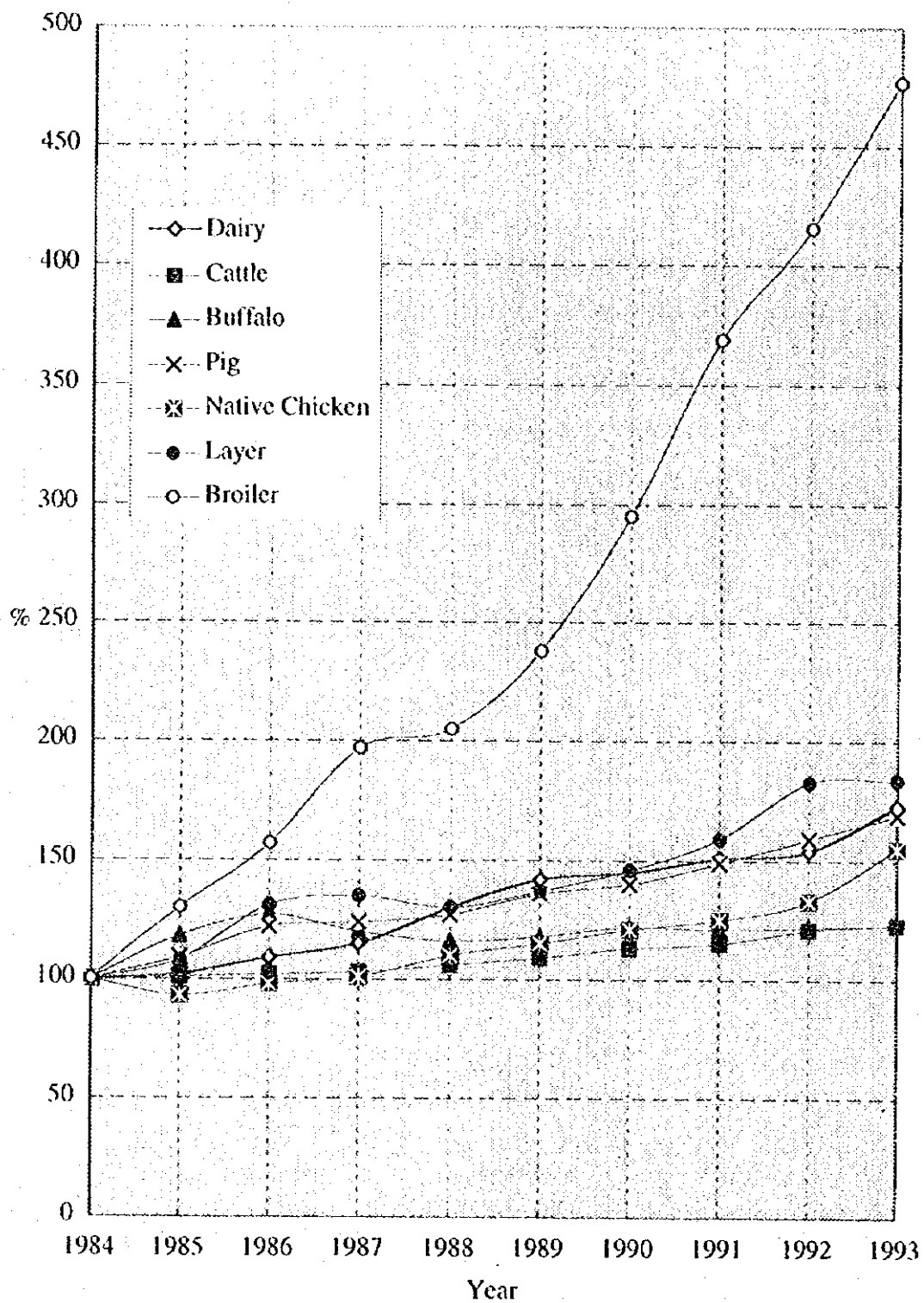


Fig: F.1.1. Livestock Population Trend Past Ten Years