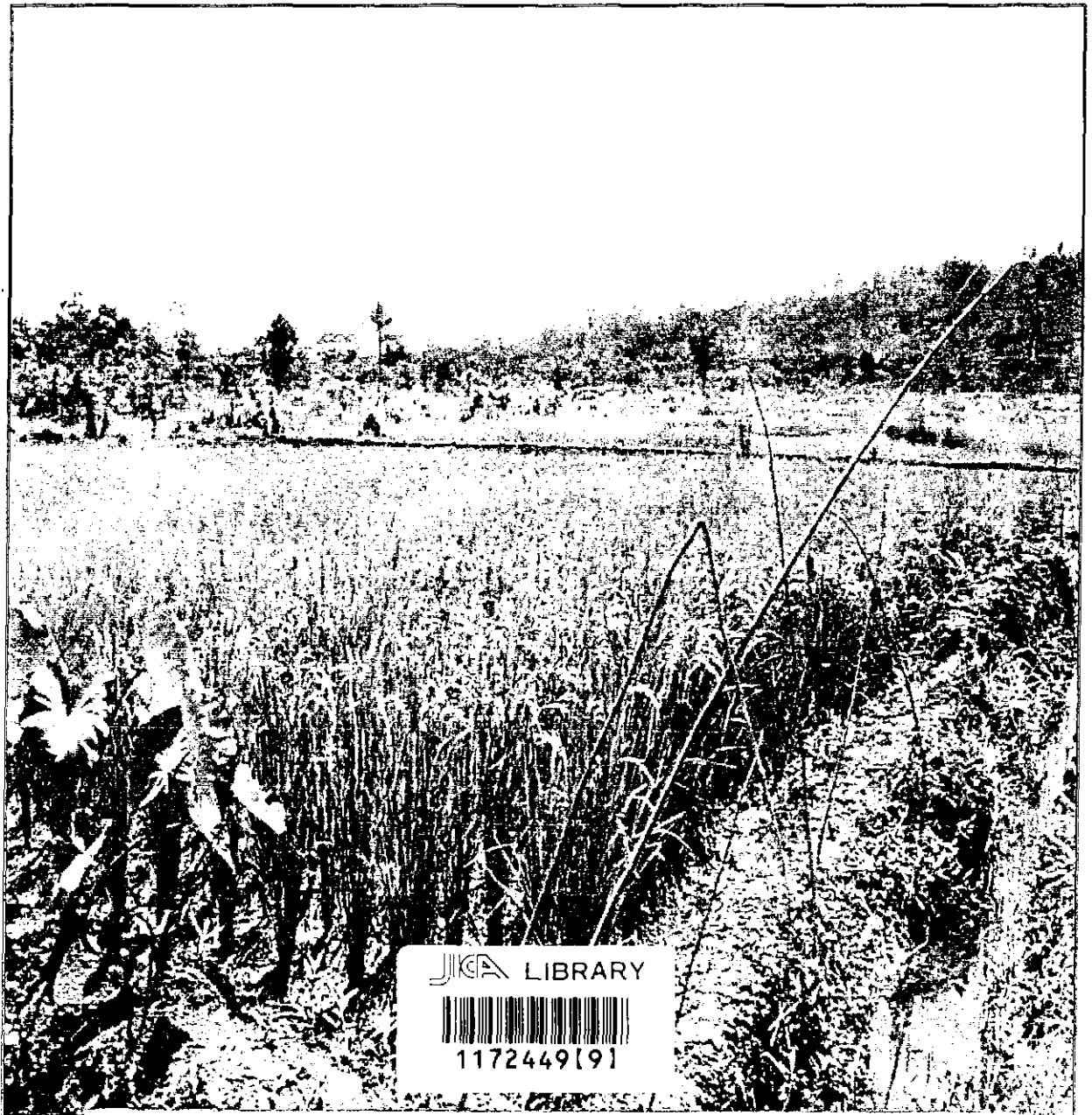


FINAL REPORT – PART I (2)

THE DEVELOPMENT STUDY ON THE PROMOTION OF SMALL HOLDER RICE PRODUCTION IN FIVE PNG PROVINCES



March – August 2002

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CHAPTER 7 SOCIOLOGICAL CONDITIONS

7.1 Central Province

7.1.1 Socio-Economic Conditions in Central Province

Social and Structure of Provincial Society

Political and Cultural-Linguistic Grouping

The Central Province is one of the five (5) Provinces of the Southern Region. Its four districts of are; Abau, Goilala, Kairuku-Hiri and Rigo with their district headquarters of Kupiano, Tapini, Bereina and Kwikila respectively. The Central Province occupies 29,900 km² of land area and is 6.5 % of the total land area of PNG.

There are many cultural-linguistic groups, the main ones being the Abau and Aroma, the Goilala, Koiari, the Mekeo – Kuni, the Motu, Rigo, the Rororo - Gabadi groups. The Goilala, Koiari groups and parts of Rigo group are on or along the slopes of the main Owen Stanley Range whilst the other major cultural-linguistic groups are located on the coastal plains.

Population

The Central Province's rural population is estimated to be at 167 000 from the 2000 National Census. This is 4 percent of the total national rural population and, is growing at an annual growth rate of 2%. High population density areas are on the plains west of Bereina (at 225 persons/km²), coastal areas around Cape Hood, Kupiano and Baxter Bay (at 160 persons/km²) and around the Cape Rodney Re-settlement area in (60 persons/km²). Moderate densities exist in other areas (at 30 persons/k m²) such around Tapini, Bereina and Kwikila. Most other areas are of low density (≥ 20 person/ k m²).

Migration Patterns

There is very significant out-migration from the Province; the highest out-migrations are mainly from the inland areas and districts such as the Goilala, in-land Rigo, Abau and Koiari areas. Other areas are accessible to the National Capital District and therefore, out-migration is relatively lower. Main out-migration destination is Port Moresby but significant populations of Goilala people are found in Wau, Bulolo and Lae. (PNG Rural Development handbook, ANU, 2001).

Accessibility and Services Provision

Accessibility to goods and services by the population is generally good for most parts of the Province excepting the Goilala District, the Koiari area, in-land Rigo area and the outer-fringes of the Abau District excepting its southern coast-line which has the Magi Highway running through it and numerous feeder road-networks run through heavily populated areas and serves to provide basic goods and services. This includes; marketing of cash-crops, transportation of trade-store goods to trade-stores in rural communities and, provide communication linkages and interaction between people

Income

Land potential and cash-cropping activities and the level of transport infrastructure development, mainly roads; determine variations in income levels between districts and in areas within districts and therefore, accessibility to urban and rural service center markets.

Income

People around Bereina and plains to the west earn very high incomes (> 200 kina/person/year) while the people from the rest of the Kairuku-Hiri District all earn high incomes (101 – 200 kina/person/year). The lower Goilala District people and people from the coastal areas of Rigo and Abau also earn high incomes while the rest of the Province earn very low to moderate. Road access and sale of both food-crops and cash-crops contribute to high to very high income for people of areas mentioned above

7.1.2 Organizational Features of Rural Society

The rural society of Central Province is similar to other parts of the country. Village communities are structured on extended family basis having the clans and extended family as base unit. Land and other resources are owned communally, the clan and family kinships playing a major in the distribution and use of these resources. Decisions are reached through consensus. The Province has a patri-lineal society which entails that male members of the families and clan have control over land and other resources and inheritance advantages. Traditional leadership of a village or community is recognized through the personal achievement of a particular male member through his personal achievements in his social setting. Decision-making is through consensus and is based on customs and traditions and, resources-use rights and their distribution.

The only exception is in the Mekeo area where traditional leadership is through the hereditary chieftain system, the eldest male-child of the chief inheriting his fathers chiefly status upon death of the father. The rule and decision-making powers of the chief is absolute, though this is gradually changing through modern educational influences but the chief still retains the power to vet and support or veto activities on all aspects of community life of the members of his clan and village.

As in most other parts of PNG, the advent of the modern system of government and the establishment of various authorities has introduced complementing lateral power structures and functions at the local levels, the organization and function of which is represented by its representatives such as the LLG councilors, the village court magistrate, the church and youth leaders and, the lower level public service officials. Apart from the traditional leader (s) in the community, these other players also play a role in community social structure and function and decision-making processes.

There are however, cultural practices such as gender division of labour, family mode of production and gardening practices. Male family members are expected to perform certain roles such as felling of trees, removal of logs and fencing while females are required to do others such as clearing of undergrowth and planting, weeding and harvesting of certain food-crops. In most areas of PNG, women are responsible for planting and harvesting activities. Rice growing is seen as an introduced funding activity to PNG's already polarized traditional division of labour and most probably will be male dominated as it will be seen by the community as giving status to the cultivator. Tutubu farmers for instance were enthusiastic about rice growing, but not so in Amau. Whilst lack of extension plus non-availability of milling facilities were the reasons for lack of interest in rice cultivation, it is probable that, that practice may also be present elsewhere, if not in Amau. This is worth considering in other areas.

Related to the division of labour by gender is the family mode of production, whereby the family operates as a unit of production. Under this, the family and even individuals become managers and proprietors, so to speak of the unit of production. Consequently, they may give up, if a chore becomes cumbersome or if additional support through extension is not available. Rice may also be seen as a difficult task, compared to growing banana, taro and other staples. However, later in the analysis of findings it may be seen that, Tutubu village has proven otherwise. Whilst one farmer grew rice at Amau (OISCA trained model farmer) although their general attitude is pro-growing rice as indicated in Table 7.4.

7.1.3 Social Situation and Factors Affecting Rice Promotion.

The main factors that may promote or hinder the promotion of rice in the study areas in the Central Province are discussed below. Also, how these main factors may affect the smallholder rice promotion program will be discussed as well in the following sociological situation analysis of the surveyed areas under the section 7.1.4 – Farmer Practices and Aspirations below.

The main factors that are envisaged to affect the rice promotion program are;

- i). land Tenure and Availability (land-rights, amount etc),
- ii). labour and its Availability,
- iii). Community Organization and Participation,
- iv). Gender and Participation of Youth and Women and,
- v). Institutional Support.

7.1.4 Farmer Practices and Aspirations

Within JICA's TOR and scope of work for this study and particularly in relation to the socio-economic aspects, the survey team was to ask questions in ten (10) main areas;

- i). Community/Household profile,
- ii). Household structure and function,
- iii). Land tenure,
- iv). Farming practices and land use,
- v). Reasons for rice cultivation,
- vi). Income earning activities, marketing and household incomes,
- vii). Accessibility,
- viii). Services provision,
- ix). Community self-help and co-operation and,
- x). Perceptions to development.

The main objective was to assess and gauge views on the feasibility of promoting rice and its acceptability by farmers and their farming systems. The results of the survey findings are to be documented and a Master Plan is eventually to be drafted from these findings.

The study methodology followed structured survey, using a questionnaire on most aspects on the socio-economic situation of the four selected villages. Of the 40 households surveyed, the first twenty covered Tutubu and Amau villages of Cloudy Bay LLG, Abau District and the next 20 household interviews were held at Idoido and Yamuna villages of Mekeo-Kuni LLG of Kairuku-Hiri District. The application of the questionnaire was by going through all questions of the socio-economic questionnaire with respondents who were mostly the heads of the respective households.

Following are the results of these surveys.

i). **Surveyed Area Location and Community and Household Profile**

Location of Surveyed Areas

All four surveyed villages are rural in their setting excepting their location. Tutubu and Amau villages are on a coastal plain and one-hour from Kupiano district headquarters. Tutubu is on the coastline and 15 minutes from the Main Magi highway, while Amau is just off the same highway but situated further inland. Both villages some 5 to 10 km from Moreguina station, a resettlement rubber estate and the main service center for that LLG for the Cloudy Bay LLG area.

Both Idoido and Yumuna villages are in the Mekeo-Kuni LLG area of the Kairuku-Hiri District and are located on government and Catholic Mission leasehold lands at Kubuna and Baikoiudu respectively.

Community Household Profile

All households surveyed are farming households, although some respondents have indicated dual preferences when asked about their most preferred activity; between food crops farming, cash-cropping and other activities such as fishing and crocodile hunting.

Household sizes range from 2 to 9 family members mostly. On the average, the surveyed areas have six (6) members per household (32.5% of the households surveyed) whilst 40% of the households have 7 members or more (refer summary Table 7.1. There are no spatial differences in household sizes between the two areas surveyed since both areas have an average of 6 persons per household.

Large farm household sizes do not mean that all households have all the labour available for farming or other activities. Available labour are those household members who are fully engaged in providing labour to household and community activities and who are at or beyond, in this case, thirteen and below fifty years of age.

In every household surveyed, there is a greater proportion of under 12-year age group than the older age ranges in all villages surveyed. In the four surveyed villages, the under 12 year age group account for 31.5% of the household population, followed by 21 to 35 year group at 21.5% and which is closely followed by both the 13 – 20 year group at 28% and 36 to 50 year age groups at 13.4%. The most productive labour units are in the 21 to 35 and 36 to 50 year age range and both account for a total of 41.4% of the population of the 40 households surveyed.

Hence, the above 41.4% of total household population in essence is the population that provides for the rest of the 58.6% of the surveyed household population. However, differences exist in terms of available labour units per household as indicated by an average of only 2 available labour units per household. The range of labour availability per household is shown in Table 7.1 indicating that, 55% of households have 2 or less available labour units, followed by 3 to 4 labour units for 20% of households, 5 to 6 available labour units for 17.5% of households and 7.5% of households with 7 or more available labour units.

In household education profile, there are no major differences between the villages surveyed. Most households have members who are educated up to high school level and many have attained basic community schooling (60 % of the total households) followed by those who attained high school or higher education (30% of total households population surveyed), the balance of 10% are those who have no formal education. In contrast to Morobe and Madang Provinces, no member of any households surveyed has had "Tok-Ples Skul" education and the reason for this is not known. Refer to summary of household profiles in Table 7.1.

Any form of literacy and numeracy is important in the physical and social development of any community. With a high proportion (90%) of the population of the households in the survey retaining their educated members, particularly the youths and young adults, development interventions may be a lot easier to introduce, understood and, support and participation in such development interventions would be inevitable once such support and participation is solicited.

Land tenure

Land tenure and land-use is very much similar to the rest of PNG with patri-lineal transfer of ownership and use, is clan-based and in most cases, an individual of respective clans having user-rights only.

Most farmers in Tutubu and Amau use clan-land with only three farmers are having permitted –use status. In this case, the three farmers using land on a permitted basis have blood relations and members of related clans and, as is often the case, their long-term use of those parcels of land under permitted-use is assured. Table 7.2 shows that 24% of households cultivate on their inherited land, 7.5% on permitted-use basis, and 13 households (32.5% of households surveyed) use leasehold land. The 13 households using leasehold land do so by permission from the Catholic Church – Bereina Diocese, for villagers at Idoido and Yumuna villages and they have long-term assurance of the use of that land. However, the former rubber-estate land east of Idoido is also government leasehold land and since farmers are using that land, the status of that land should be investigated further by Central Provincial DAL and Lands Divisions for long-term smallholder rice farmers to use.

In all surveyed areas, garden sizes are small and are scattered. Farmers having more than one garden have to walk for up to one hour and back, consuming much time. The flat plains at Tutubu and Amau makes traveling to and back from gardens much easier in contrast to Yumuna and Idoido farmers who have longer traveling distances and they travel along high slopes.

Number of gardens per household varies with 12 households having 2 or less gardens (30% of households), 24 households or 60% having 3 to 4 gardens and 4 households or 10% of households having 5 to 6 gardens. Refer summary Table 7.4. For the 24 households growing rice currently (55% of households), one of these gardens is a rice garden.

Land is adequate as disputes over land and its use was not encountered and that all farmers stated that land is available and is adequate for current and future need. The only case for investigation is the use of leasehold land by Idoido villagers at Kubuna as mentioned above.

The lack of disputes over land may be a reflection of low land pressure due perhaps to; a low population density, abundant land availability, good community /inter-clan relationships or, any combination of these factors. The population densities for both Kubuna and Bakiudu

areas and Kupiano to Abau coastal area is low (1 – 20 persons per km²) to moderate (21 – 60 persons per km²) and therefore pressure on land is low.

Household structure and function.

Similar to most households throughout PNG, each household operates as a nuclear family but interacts very closely with the extended family and the clan as well as other clans related through blood relations. The head of the household is the male parent and is the overall decision maker regarding social and economic well-being of the household. The decisions on land and its use, what to grow, what to market, who should attend school, financial matters and the households relationships and interactions with other households and the greater community is decided by him. In his absence, most particularly by death, the female parent assumes that role or the eldest male child of adult age.

When introducing rice or any technology relating to all aspects of rice development, the entry point into the household is the head of the household as all factors of production at the village level are controlled and decisions on their use is through the head of the household.

Farming practices and land use,

Traditional slash and burn and shifting gardening is the main practise in all the areas surveyed. Land is left fallow for five to ten years before a new garden is cleared and cultivated. Cleared bush and logs are burnt and then land is cultivated. Only where pigs are let to root are fences around gardens erected but in the two study areas in Central Province, no fences or pigs were observed and therefore, fencing gardens, which would require additional labour, is non-existent. Hence, farmers in these two areas can cultivate rice without erecting fences.

As stated, land is fragmented and garden sizes are small and scattered due to the nature of clan and family land tenure. In this context, it was observed that a family having two to three gardens has to walk some distance to reach the next garden. This must be noted in promoting small-holder rice development.

Farming activities are varied with the dominant activity being food-crops gardening, cash-cropping, rice farming (for those currently growing it) and other economic activities such as marketing and followed by involvement community activities. In both areas, staples consisting of cooking bananas, taro (both *collacasia* and *xanthosoma*) are grown.

There are no cash-cropping activities in Tutubu and Amau villages, while Idoido and Yumuna villages tap rubber but intermittently due to depressed prices and lack of buyers.

Betel nut and mustard cultivation and selling is one of the main farming activity for Yumuna and Idoido villages, while very little of that was evident in Tutubu and Amau villages. This is reflected Table 7.4.

Farmers use basic farm implements for cultivation and harvesting. Spades, bush-knives and axes are the main implements used. All farmers interviewed do not use tilling equipment such as hoes. Though reflected in the survey questionnaire and not included in the summary tables, there is a acute shortage of simple farming implements and in the case of rice, proper tilling, cultivation and processing tools and equipment, even simple tong tongs were not seen

at all with the exception of a case at Tutubu but is probably not so common or in use even in that village.

In preferred farming activities, 26 households or 65% of respondents prefer food-crops farming to 2 households or 5% of households preferring cash-cropping, while the remaining 12 households or 30% of respondents prefer other activities mainly; fishing (two households at Tutubu) and marketing of betel nuts and mustard (10 households at Idoido and Yumuna).

Reasons for rice cultivation and its Effects.

Rice is grown in the two study areas; with 22 households or 55% of interviewed households growing it and not by 18 households (45%) of households, although they are interested in the event that rice is introduced to them in the future. Amau had rice introduced through the OISCA model farmer but has not taken-root simply because, this model farmer had not disseminated knowledge and had not organized farmers to do so. This is an important point in the selection of model farmers in the future in that, trained model farmers are those who are willing and capable of giving on-training to other farmers.

From the survey, the four reasons for growing rice; taste, food, cost and for sale, 40% or all households interviewed do so (and would do so for those not growing it now but would in the future) for food consideration. Twenty-six percent of responses stated for sale to improve household incomes, 20% stated that to grow ones own rice would be cheaper than rice from stores as they are expensive. For taste consideration, only 6% of responses responded positively. The responses to reasons for growing rice were multiples, that is, more than one answer was given by anyone respondent, hence, the total responses are over 40 as would be expected. Refer summary Table 7.3.

Summary table 7.3 shows that almost all households (37% of households interviewed) stated that rice cultivation has no effect (for current rice growers) and will have no effect (for future growers) on the two main factors of production; land and its availability and, labour and its availability. All respondents stated that it is not affecting and will not affect their food-crops gardening activities with the integration of rice into their farming systems.

Community self-help and co-operation.

All respondents (40 households or 100% of respondents) stated that community co-operation is a norm and often when required, clans and members of households within clans co-operate on community activities or in helping individual households in the event that an activity for an individual or clan is beyond their resources. In such activities as; construction of houses, making gardens, death ceremonies, community construction such as in constructing elementary schools and teacher's housing, all farmers and individuals co-operate for community good. Community co-operation is traditional, with the reciprocity perspective in mind for those helping then. Refer summary Table 7.3 below.

Income earning activities, Marketing and Household Incomes

The main income earning activity is food and cash-crop marketing. Twenty-eight percent of households are engaged in marketing of food and cash-crops and the remaining 12% of households market other commodities such as fish and betel nut and mustard marketing. Of the 28% marketing households, 18% sell only food-crop staples, 7% staples together with cash-crops and 3% of households only cash-crops. The remaining 11% of households are

marketing other commodities such as fish and betel nut and mustard. Fish marketing is by farmers from Tutubu and betel nut and mustard marketing is done mainly by 10 households at Idoido and Yumuna villages.

There is no rice marketing by any of the households in any of the villages surveyed. Refer summary table 7.3 below.

Household incomes are very low to moderate and incomes for households range from very low (0 – 20 kina per household per month for 37.5% of households surveyed), low incomes (21 – 40 kina per household per month for 15% of households) and moderate incomes (41 – 100 kina per household per month for 25% of households). Very few households are at the high income (101 to 200 kina per household for 7.5%) and very high (≥ 200 kina per household per month for 15% of households) range.

Accessibility to Services and Services Provision

Accessibility to goods and services for households in the study are is poor. Roads access is the main mode of transportation and the poor market accessibility experienced and the resulting low household incomes are the consequence of this. Trade-stores are providing basic goods such as soap but are often not stocked or stocking is very intermittent and this is reflected in the general household out-look. This is reflected in summary Table 7.4.

Extension services provision to the study areas is very poor. Many factors contribute to this but, from observations and comments of respondents, funding and support facilities for extension agencies are poor and physical infrastructure such as roads servicing the study areas are in run-down conditions.

The public transport is not very regular due to poor road conditions, particularly the Tutubu and, Kubuna to Bakoiudu feeder roads leading from the two respective main highways. This negatively affects goods and services delivery, particularly the regularity of availability of these goods and services.

This situation is very serious and for consideration given that success of extension support programs at the LLG, district and Province levels which may be provided under future smallholder rice extension program, will be negatively affected due to current low accessibility for extension staff to farmers and farms sites.

Perceptions to Development

Household development preferences and perceptions as indicated in summary Table 7.3 and meet households are pro-development. They prefer roads up-grading (35% of households), schools upgrading (27.5% of households) and, aid-posts upgrading (17.5% of households). The remaining 20% of households prefer rice projects introduced into their area.

Table 7.1: Summary of Household Profile of Study Area, Central Province

	No. of Farmers by Sex		Households Size				Available HH Labour Units				HH Age Distribution in years (for total 232 HH pop. Surveyed)					Main Occupation			Surveyed Farmers' Education Level			
	M	F	≤2	3-4	5-6	≥7	≤2	3-4	5-6	≥7	≤12	13-20	21-35	36-50	≥51	Farmer	Govt. Worker	Other	NSL	TPS	CS	≥HS
No.	40	0	3	8	13	16	22	8	7	3	73	50	65	31	13	40	0	0	4	0	24	12
%	100	0	7.5	20	32.5	40	55	20	17.5	7.5	31.5	21.5	28	13.4	5.6	100	0	0	10	0	60	30

Source: JICA Smallholder Rice Promotion Study, 2002.

Table 7.2 Summary on Land Tenure, Central Province

	Own (*)	Inherited	Permitted use	Leasehold		Land Adequacy	
				Titled	Untitled	Yes	No
No	0	24	3	13	0	40	0
%	0	60	7.5	32.5	0	100	0

Note: (*) "Own" means land that is not inherited but purchased from others.

: (**) "Titled" does not mean that farmers have a formal title-lease but refers to the case at Idoido and Yumuna where farmers are allowed settle on Catholic Mission leasehold land.

Table 7.3: Summary of Preferences and Attitudes Towards Rice and Development Projects of Surveyed Households, Central Province.

	Preferred Activities			Effect of Rice on F/Crops Gardening, Land & Labor		Important Projects				Why Grow Rice				Community Co-operation & Sharing		Development in the last 10 years	
	Food crops	Cash crops	Others*	Yes	No	A/Post	Road	School	Other (**)	Like it (taste)	Eat it (food)	Cheaper (cost)	Sale (income)	Yes	No	Yes	No
No.	26	2	12	3	37	7	14	11	8	6	40	20	26	40	0	18	22
%	65	5	30	7.5	92.5	17.5	35	27.5	20	15	100	50	65	100	0	45	55

Source: JICA Smallholder Rice Promotion Study, 2002

Note: (*) Two farmers at Tutubu village who prefer fishing and ten farmers at Idoido and Yumuna who prefer Betel nut and mustard growing and sales activities.

(**) Mostly rice project development

Table 7.4: Summary of Farmers' Farming Activities, Land-use, Marketing and Marketing Problems of Surveyed Households, Central Province

	No. of Gardens				Growing Rice		Selling F/C & C/C Crops		Types of Crops Sold				Marketing Problems (**)							
	≤2	3-4	5-6	≥7	Yes	No	Yes	No	Staples only	Staple & Cash Crop	C/Crops only	Other (sells betel nuts etc.)	M	F	Both	Non-seller (sells betel nuts etc.)	Transport High Cost	Un-Avail.	Low Sales Price (*)	No Problem
No.	12	24	4	0	22	18	28	12	18	7	4	11	1	23	4	12	28	36	1	2
%	30	60	10	0	55	45	70	30	45	17.5	10	27.5	2.5	57.5	10	30	70	90	2.5	5

JICA Smallholder Rice Promotion Study, 2000.

Note: (*) denotes that surveyed households gave more than one answer to marketing problems. Hence, number of responses is tallied and totals are by type of response and not by the total of 40 households interviewed.

Table 7.5: Household Incomes of Surveyed Households of Tutubu and Amau of Abau District and Idoido and Yumuna villages of Kairuku District, Central Province

Level of Income (Kina/HH/year):	Very Low : 0 - 20	Low : 21 - 40	Moderate: 41 - 100	High : 101 - 200	Very High: >200
No	15	6	10	3	6
%	37.5	15	25	7.5	15

Source: JICA Smallholder Rice Promotion Study, 2000

7.1.5 Social Changes and Services

The two study areas are well connected to urban centers such as Kupiano, Kwikila and Port Moresby for the Tutubu and Amau areas and to Bereina and Port Moresby for Idoido and Yumuna villages. Hence, accessibility to goods and services and changes associated through education, proper health and hygiene, cash incomes and the general standards of living have improved over time. Households have indicated through the survey that, they have experienced social changes such as in dressing, food types eaten and, access to education and health. This is indicated in their responses in their development preferences and attitude to development in the surveys. Refer Table 7.3 above. They want to maintain the improvements in their social situation and hence, basic requirements such as maintenance of roads, aid-posts, schools, marketing services for cash and food-crops to be improved and which are currently in a run-down condition.

One such change in social behaviour is in food preferences. People in both areas prefer trade-store food such as tinned-fish and rice. Hence, the positive response to wanting to continue to grow rice or to participate in growing rice in the future has been observed as reported in the earlier section – Farmer Practices and Aspirations above.

7.1.6 Economic Situation and Factors Affecting Rice Promotion

The main economic factors that affect the surveyed villages and which might affect rice promotion at the local level, particularly in the study areas are; accessibility, cost in maintaining services such as extension, marketing, up-grading of feeder roads, cost of trade-store goods particularly rice, cost of inputs such as agricultural tools and equipment and, prices of commodity cash-crops and thereby incomes received by households.

Accessibility by roads to study areas is poor due to run-down state of access roads. Transportation of cash and food crops to market and trade store goods and extension services to the study areas suffer similarly. Cost of trade-store goods, particularly of basic items such as rice, tinned-fish and, soap has gone up and is increasing. Also cost of agricultural inputs such as basic cultivation and harvesting tools and equipment are high and, with low household incomes prevailing in the study areas, these very necessary tools and equipment are beyond the reach of smallholder farmers. Rice cultivation, harvesting and processing will require costly specialist tools and equipment which, at present, is too costly for farmers to purchase.

Low commodity prices, lack of buyers for commodity crops, high transportation cost all contribute to low household incomes and poor extension and other services availability. Farmers require funds for tools purchases and currently the above economic conditions are not conducive for farmers to do so.

As seen at Tutubu and Amau, rice had been introduced but no follow-up extension advise was given by the district DAL due to lack of funding, lack of transport vehicles and poor road conditions. This is a situation that requires provincial, district and LLG authorities to look into for the successful promotion of rice in the respective study areas.

Trade-store rice are expensive and will remain high due to costs of transport and high cost of *imported rice* itself. Hence, the need for households to grow their own rice is strong and will remain so and, this is a strong point for the promotion of small-holder rice in the study areas.

Hence, this situation has prompted farmers to grow rice for their own consumption and others are willing to do so only if seeds, extension advise and, proper tools and equipment are available and at affordable cost. This is important as experience at Tutubu showed that rice was grown from seeds given in 2000 but due to lack of extension follow-up and advise onprocessing, harvested rice was kept until April 2002, the date of the study team's visit.

Competing economic activities are low to non-existent in the two study areas. Betel nut and mustard marketing and the purchase of rice has been the case in the Mekeo area which has contributed to the failure of rice promotion in that area. The same does not apply for the two study areas, particularly for Tutubu and Amau as they are not major betel nut and mustard growing and marketing areas hence, there is little diversion to rice promotion program as this program will be aimed at food self-sufficiency and not as a cash-crop as was the case for the Bereina area.

7.1.7 Farmer's Organizations

There were no farmers' groups identified in both Tutubu and Amau villages. There are no umbrella farmer's organizations for the entire Cloudy Bay LLG area. The nearby Cape Rodney Rubber Re-Settlement Scheme, if it had any farmer's organization that facilitated the rubber-block holders affaires is by now defunct with little, if not, *no trading in cup-lump rubber* going on. Otherwise, such an organization would now be organizing the purchase of rubber from the small-holder block owners. The Study Team visited the Provincial DAL station at New Town, the Service-Center for Cloudy Bay LLG but the staff there did not mention any such organization for the block-holders in the re-settlement scheme or on any farmer's group in the area.

The same applies for the Idoido and Yumuna study villages with regard to farmer groups aimed at agriculture development. However, villagers of Idoido are landowners of the Inika Timber Rights Purchase Area where logging by a Korean or Malaysian logging company is going own. There is a Inika landowners' Group with an established executive but little in terms of developing the village was evident. Some landowner respondents, while being interviewed were making comments to the effect that, the land-owner company is mis-managing royalty money from logging operations.

There are no formal or informal farmer's groups existing in the two areas. It is known that the two villages have youth groups but these are organized for sporting activities rather than economic activities.

The two study LLG areas have rubber estates with rubber trees that can still be tapped. Some farmers at Idoido still tap rubber, but do so intermittently. These farmers have complained of very high transportation costs for transport of rubber to *Doa Rubber Factory* and also of lack of buying rubber by that company.

Farmer organizations are of vital importance for group action in any agricultural activity including rice. The success of the rice promotion program will link upon such groups being identified and mobilized to participate in the rice promotion program in the future. The Central Provincial Administration should, through its Community Development/Division to identify existing organizations to facilitate development in the small-holder rice promotion program.

7.1.8 Land Rights

In PNG, 97% of all land is under customary ownership and the remaining 3% is alienated land. Customary land does not have clear ownership to it, this being the case, there is no clear guarantee of individual ownership and hence, the use of any parcel of land has to be vetted by families and clans under a customary tenure system under which it operates. Alienated land or freehold land (about 3%) can be bought and sold, has market values and can be used as collateral for any loan commitments. In contrast, customary land is seldom bought or sold. Therefore, there is no formal markets for it and, has no standardized market values set for its sale. Also, land tenure is such that land is generally fragmented and scattered and, individual blocks are not of economic size for large-scale development on the same block of land.

Hence, difficulties are experienced in obtaining secure customary land for development of any kind. Access to investment finance is difficult owing to the fact that customary land cannot be offered as collateral. To add to this, the established land administration system is cumbersome and its administration is often difficult. This is the general scenario that may confront any investor in any development endeavour who might be using modern approaches to developing customary land.

The legal frame-work for the use of customary land is the use of lease-lease-back system, the Clan-Land Use Agreements or the incorporation of integrated land group.

Customary land is generally used through user-rights given to family and clan members, the clan being the family grouping which over-sees to such allocation.

In the use of customary land for development such as rice cultivation, the approach to be used when using clan land should be the same the current approach taken for cash cropping such as for coffee and cocoa. As in subsistence gardening and in cash-cropping, individuals can use their user-rights to land to cultivate rice on a small scale given the fragmented and scattered nature of customary land.

7.1.9 Water Rights

Legally, water use and water rights come under the management of the State through the Water Resources Management Act (1982) and as administered by the Department of Environment and Conservation and the PNG Water Board.

However, similar customary land-ownership issues arise and the traditional and legal approach taken with regards land and its use is also applied to the use of water and water rights. This is because, the possibility of irrigating rice farms using water sources from customary land is connoted here. In that case, user rights as described above also applies to water and water rights.

7.1.10 Rural Credit Associations

There are no formal or informal rural credit associations existing in the two study areas. This is also true for any farmers organization with the objective of developing agricultural activities as stated earlier.

This is an important area for consideration to ensure those individual farmers and farmers' groups that require funding to start projects may be able to mobilize their own funds for project development purposes. Where formal lending institutions are unable to lend due to their cost structures and lending policies, provision of micro-credit that is tailored to meet specific needs of rural farmers and which gives due consideration to the constraints under which farmers operate is a essential requirement for development. This has been found to be working for other developing countries in Asia and elsewhere and in those cases, it has been possible through mobilizing financial capital through the formation of rural credit associations.

There are some Provinces in PNG which have funds for loan purposes and which is provided through the provincial governments for community development projects. Other Provinces have Savings and Loans Societies and these operate by providing loans and savings on very favourable terms to its clientele, be it farmers or otherwise.

In late 1960s to early 1970s, many Savings and Loans Societies as well as *Development Co-operatives* were started by the government. These societies failed and were eventually abandoned for many reasons, one of which was poor management, poor understanding of the purposes for and knowledge of how to achieve the objectives of such societies.

At the Provincial level, the Study Team did not learn of any rural credit association or savings and loans societies in the Central Province. This requires further investigation.

7.2 Morobe Province

7.2.1 Social Structure of Provincial Society

7.2.1.1 Political and Cultural-Linguistic Grouping

The Morobe Province is one of the three Provinces of the Momase Region and has nine (9) districts. These are; Wau-Bulolo, Menyamya, Lae, Huon, Nawae, Markham, Finschhafen, Kabwum and Tewai-Siassi Districts. The nine districts headquarters are; Bulolo, Menyamya, Lae, Mutzin, Finschhafen (Dagidu), Kabwum, Salamaua, Bukaua, and Wasu Stations. Morobe Provinces covers a land area of 33 525 km² and is 7.24 % of the total land area of PNG.

There are many cultural/linguistic groups, some of the major ones being the Kotte of Finschhafen, the Markham of the Markham Valley, Menyamya and Watut of the Anga group, the Buang, the Yabim of the Bukawa to Salamaua area and the Biangai-Waria-Garaina group.

7.2.1.2 Population

The 2000 National Census show that the population of Morobe is estimated at 307 000. This is 7.6% of the total national rural population. It has a growth rate of 1.5% and has low to moderate population densities excepting the Malai and Tuam Islands near Siassi Island. These two islands have 400 persons/km² districts while the Sialum coastal plains and the Kabwum District have a density of 105 persons/km² while the Teptep and Snake Valley areas have a density of 70 persons/km².

7.2.1.3 Migration Patterns

There is a significant in-migration into the Lae urban and peri-urban areas by people seeking better services and employment opportunities while a lot of out-migration has occurred from the Menyamya, in-land Salamaua, Huon Peninsular and Buang areas (PNG Rural Development handbook, ANU, 2001).

7.2.1.4 Services Provision and Accessibility

A large number of community groups are located in small isolated communities in mountainous areas. In these areas, transport infrastructure is very limiting except by small aircraft which is the only form of transport bringing basic goods, transportation of cash-crops, transport people and, health, education and other services. High airfreight costs drive the cost of trade store goods high and also keep the returns on cash crops low. This results generally in low standards of living, poor accessibility to services such as education (high and unaffordable school fees, health costs etc.) and, restricts people's ability to access information and exert political and other influences in urban centers where most decisions governing national and rural development are made. Consequently, communication and interaction within and between these groups are very limited.

The situation is very much different in such areas as the Markham Valley and Lae District as well as the Bukawa, Buang and the Wau-Bulolo areas where accessibility to goods and services, information and, communications are a lot better and much

easier. These areas have the advantage of major highways including the Highlands Highway and the Wau-Bulolo road running through them and connecting many other districts and areas such as Menyamya District and the Waria Valley and the Buang area. The Lae District is essentially urban in nature, harboring the Provincial Capital and, is the best developed in most aspects of development.

7.2.1.5 Income

Income levels between districts and in areas within districts vary very much and are determined mainly by the level of transport infrastructure development and therefore accessibility to urban and rural service center markets. In the main, most areas of the province have very low incomes of 0-20 kina per capita particularly for people in the rural areas of Finschhafen, Menyamya and Tewai-Siassi and about half of the population of Bulolo, Kabwum and a third of the population of Markham and Nawae Districts.

Very high levels of income (at > 200 kina/person/year) exist in areas with improved transport and other services infrastructure such as along the Markham Valley, Lae District, and around Mumeng and Zenag stations. The populations in most coastal areas and Kabwum and Kaiapit stations and their surroundings have relatively high levels of income at between K101 to K200 per person per year. The rest have moderate incomes at between K41 and K100 per person per annum (PNG Rural Development handbook, ANU, 2001).

7.2.2 Organizational Features of Rural Society

Morobe Province's rural society is organized in the same way as in other parts of PNG. The rural social structure and function of its communities are on a clan and kinship basis where its leadership structure and function is non-hereditary, based upon personal achievement and, decision-making is based on customs and traditions. Inheritance of land, property and other traditional rights transfers are patri-lineal and is generally the norm.

The study areas, Wareo and Salodi villages in the Kotte LLG area of Finschhafen District and the Poahum village of Nawae are no different. However, the advent of the modern system of government and the establishment of various authorities has introduced complementing lateral power structures and their representatives are the LLG councilors, the village court magistrate, the church and youth leaders and, the lower level public service officials. Apart from traditional community leader(s), these other players also play a role in community social structure and function and decision-making processes.



ACS Staff interviewing heads of households from 3-5 Mile at the Salvation Army hostel in . Lae. MIP

7.2.3 Social Situation and Factors Affecting Rice Promotion

The background to social situation of traditional PNG society and in general, how this might affect rice promotion has been established in the discussion on the sociological situation of the Central Province in this chapter (section 7.1). Some of the main factors that may promote or hinder the promotion of rice in the study areas of the Morobe Province are discussed below.

7.2.4 Land Tenure and Availability (land-rights, amount etc)

Land ownership and or user-rights are clearly some of the main issues. Rice promotion in the study areas and other areas are bound to use customary land for rice cultivation. Land-holdings and user rights are permitted through clans and family groupings within clans. It is through them that a family member may use any block of land for whatever purposes including rice cultivation. There is no clear individual ownership.

In almost all cases, males have authority over and control land and its use. The female members of the family or clan, if they marry outside of their community and yet live within the community, they must first seek the clan or family permission to use any block of land since it is understood that once they marry, they are to use the land belonging to their husbands and their clans.

Thus, understanding the allocation of land for specific uses is a consideration, particularly in the allocation of land for different farming and other activities, such as for gardening, for cash cropping and, for rice cultivation.

The fragmentation and scattered nature of land is another consideration. Clans, families and individuals do not own land in large blocks and or often, blocks of land owned are not in close proximity to each other. Fragmented, is often very much less than a hectare and must be considered if expansion of farming activity, including that of rice, is to be considered.

The above point is to be considered for rice promotion in the Kotte LLG (Wareo and Salodi) and Situm/Nawae (Poahum) areas. From observation, there are no land shortages or land-rights problems notably at Wareo and Salodi and the Poahum village. Farmers at Lae, the 3, 4 and 5-mile block-holders, are all using leasehold

government land, albeit without titles. Individual blocks of land there are large and a decision to grow rice and for further expansion of rice cultivation does not pose problems for them, except in the event that the Department of Lands intervenes regarding farmers that are using those lands without land titles. Expansion of rice farming towards the Markham river is possible because land towards the river are water logged and currently, only rice is the most suitable crop under that physical condition.

Selection of model farmers and the expansion of the rice promotion program at Wareo, Salodi, Poahum and their surrounding villages would not pose any problems. Farmers in the Lae District areas of 3, 4, and 5-mile are to be carefully selected to be model farmers along the criteria emphasizing past history and prospects for future long-term rice cultivation considerations. At later stages, the expansion of the rice program involving other farmers in the Lae area should only be on the basis of whether they have proper titles to alienated land or not. This is because of the urban situation, whether or not model farmers eventually divert into other economic activities other than rice cultivation in the future. In comparison, rural farmers have their mainstay in farming and would, under most circumstances, not give up farming.

7.2.5 Labour and Its Availability

Rice cultivation, harvest and post-harvest practices are labour intensive activities and therefore, the amount and availability of household labour is a major consideration. Also, as seen from the survey, farmers do not cultivate only rice and food crops but also cash crops and, very often have more than one garden. At the initial stages, it is critical for implementers of the rice promotion plan to identify farmers that have no history of multi-garden and multi-activity orientation.

A head-count to ascertain the ages and, whether or not children go to school for households being considered to be under the rice promotion program is important. This is given that, school-age children may be counted as available labour units to the household but, some of these children may easily be full-time students and away most days of the week. Others may have disabilities that may make those persons incapable of providing full labour or may not provide any labour at all.

7.2.6 Community Organization and Participation

In the past, it was a general practise to strengthen government institutional capacity to do effective planning and implementation at the decentralized levels and this was only one aspect of the overall framework necessary for development. It is now realized that, the other aspect for effective development is to have project beneficiaries at the local level to play an active and continuing role in planning for and carrying out development programs. This is the much-touted bottom-up approach.

Community organizations and their full participation is important in facilitating development at any level; village, ward, LLG, district and provincial. It is now common knowledge that for development to be meaningful and sustainable in the long-term, grass-roots organizations must be involved from the out-set.

This can be done through the identification, categorization by type of endeavour they are engaged in, how each grass-roots organization fits into the development equation,

identify their strengths and weaknesses and, identifying how to strengthen and integrate them into the development process. Where such organisations do not exist, the community can be organized through community mobilization under the existing government institutional framework and or through external NGOs support.

It is a common and general policy of most NGOs and donor agencies is that, assistance towards rural development must be through community based grass-roots organizations. Also, they have to be registered and are *bona fide* organizations, recognized by local authorities for what they claim to be doing and that they are credible.

This study identified only a few grass-roots farmer's organizations in Morobe. They were at Poahum village (groups name unknown but this group was assisted by ROC to grow rice in 2000 but has failed and discontinued), two groups at 3 and 4-mile settlement areas of of Lae District namely; Ari Farmers Group and a Youth Group (name and membership un-known). In the Kotte LLG of Finschhafen District, no farmer's group or association was identified at both Salodi and Wareo villages.

7.2.6.1 Gender and Participation of Youth and Women

This is an important consideration given that all community and household activities are shared responsibilities. The role of women and youths is emphasized by government agencies as well as donors and NGOs simply because they contribute very significantly to household, farming and all community related activities.

From the survey results of all communities surveyed, it was found that there was gender differentiation in activities within households. For instance, all the members of the households shared all gardening activities but food crops marketing was the sole responsibility of the female gender. In the Lae district area, a local youth group is engaged in rice production as part of their youth development schemes. These two examples explain why the promotion of smallholder rice program must incorporate the role of women and youths in its programmes.

7.2.6.2 Institutional Support

Institutional support is often the precursor to any type of development in most rural setting in many developing countries. Without technical inputs, funding and manpower, no development activity will take-off and be sustainable in the long term. This is a given, even if the village communities know what the problem is and know the solution(s) to the problem, they would still require resources to solve it.

There is no better example than the institutional support required in the current study regarding rice promotion for smallholder farmer self-sufficiency and, eventually as an additional source of household income. Without the current study on smallholder rice promotion, farmers would still do the same things and, the LLG and district extension staff would continue to conduct routine jobs. With institutional support from the national DAL and technical support and funding from JICA, the current study program and the various projects that are to be implemented in the future would not have come about.

Thus, for the smallholder farmers and key stakeholders from villages to participate fully in achieving the objectives of this program, provision of adequate support in

terms of technical advice, funding, training, inputs supply, marketing support, provincial and district/LLG extension program support and community mobilization are priority areas for consideration. Detailed planning of smallholder rice promotion program at the provinces, districts and LLGs will identify such resourcing constraints and funding resources.

7.2.7 Farmer Practices and Aspirations

Within JICA's TOR and scope of work for this study and particularly in relation to the socio-economic aspects, the survey team was to ask questions in ten (10) main areas;

- i). Community/Household profile,
- ii). Household structure and function,
- iii). Land tenure,
- iv). Farming practices and land use,
- v). Reasons for rice cultivation,
- vi). Income earning activities, Marketing and Household Incomes,
- vii). Accessibility,
- viii). Services provision,
- ix). Community self-help and co-operation and,
- x). Perceptions to development.

The main objective was to assess and gauge views on the feasibility of promoting rice and its acceptability by farmers into their farming systems. The result of survey findings is to be documented and a Master Plan eventually is to be drafted from these findings.

This study was to cover 40 household surveys, twenty for each of the two districts selected. However, the initial selection of Markham area was deemed inappropriate by the Provincial extension service management who requested that, the Lae District be the substitute. Hence, the selection of 3, 4 and 5-Mile Settlement area of the Lae Urban periphery and that of Poahum village in the Situm area.

Following are the survey results for the Wareo and Salodi villages of the Kotte LLG area of the Finschhafen District, the Lae District's 3, 4 and 5 - Mile Settlement area and the Poahum village all in the Morobe Province.

i) Community and Household Profile

The surveyed areas had three different settings. The Wareo and Salodi villages are wholly rural whilst the 3, 4 and 5-Mile settlement area is urban. The Poahum village is a mixture of both urban and rural because, it is a few kilometers from the Lae urban periphery area, is connected by an all-weather road and is part of the RSL Resettlement Blocks. Hence, the differences observed in Tables 7.6 to 7.9 below is a reflection of these locational differences observed in the study area.

Household size varies and ranges from 2 to 8 family members mostly but the average is 5 members.

ii). Land tenure

Land tenure and land-use is very much similar to the rest of PNG with patri-lineal transfer of ownership and use, is clan-based and in most cases, an individual of respective clans having user-rights only. Wareo and Salodi villages are in a traditional

rural setting and, land ownership, user-rights and land-use is as described as for Central Province above. There are no cases of "permitted use" of land or rented clan land as every individual has a traditional right to the use of clan lands.

In Wareo and Salodi, land is fragmented and hence, garden sizes are small (though not captured in the questions but observations were made) and on the average, each household having 3 to 6 gardens to account for short-falls in production from one garden. All respondent farmers have at least one garden of rice, which is either inter-cropped with traditional staples or mono-cropped, and in many cases, both cropping types apply.

There are no disputes over land and this may be a reflection of low land pressure, due perhaps to; a low population density, abundant land availability, good community /inter-clan relationships or, any combination of these factors. However, it is a positive setting regarding land availability for smallholder rice promotion in that area.

Table 7.6: Summary of Household Structure (Age, Sex, No. of households members, Education and Occupation) of Surveyed Households, Morobe Province.

	WAREO		SALODI		3.4 & 5 Mile		POAHUM		Total	
	No	%	No	%	No	%	No.	%	No	%
1. No. of Farmers By Sex:										
Male	10	100	10	100	9	90	6	60	35	87.5
Female	0	0	0	0	1	10	4	40	5	12.5
Total	10	100	10	100	10	100	10	100	40	100.0
2. Household Size:										
>2	2	22	4	44	2	20	3	30	11	27.5
3 - 6	7	78	3	33	6	60	5	50	21	52.5
7+	0	0	2	23	2	20	2	20	8	20.0
Total	9	100	9	100	10	100	10	100	40	100.00
3. HH Age Distribution:										
> 12 Yr.	12	27	12	21	13	27	14	29	51	25.9
13 - 20 Yrs.	6	14	15	26	9	19	11	23	41	20.8
21 - 35 Yrs	12	27	18	32	17	35	11	23	58	29.4
36 - 50 Yrs	13	30	10	18	7	15	9	19	39	19.8
51+	1	2	2	3	2	4	3	6	8	4.11
Total	44	100	57	100	48	100	48	100	197	100.0
4. Main Occupation:										
- Farmer	10	100	10	100	10	100	10	100	40	100
- Govt. Worker	0	0	0	0	0	0	0	0	0	0
- Politician	0	0	0	0	0	0	0	0	0	0
- Other	0	0	0	0	0	0	0	0	0	0
- Total	10	100	10	100	10	100	10	100	40	100
5. Education Level: (*)										
- NSL	0	0	1	10	1	10	1	10	3	7.5
- TPS	0	0	3	30	0	0	3	30	6	15.0
- CS	9	90	5	50	5	50	5	50	24	60.0
- HS & over	1	10	1	10	4	40	1	10	7	17.5
- Total	10	100	10	100	10	100	10	100	40	100.0

Source: JICA Smallholder Rice Promotion Study, 2002.

Note (*): NSL stands for Non School Leaver (no formal education)
 TPS "Tok Ples Skul"
 CS Community School
 HS High School

In contrast, the Poahum village farmer and farming setting regarding land-ownership and, land-use and rights is a mixture of traditional and modern systems. Poahum area is within the Situm RSL government leasehold blocks. Some landowners have acquired some of these blocks and therefore have both traditional rights and government lease rights over the lands they occupy. The only exception was that some respondent farmers there use land on a permitted basis, mainly through marriage relations, those farmers having come from inland Nawae area. The arrangement is that "rent" paid is not in cash, not time-based and formal. Therefore when any particular landowner has some financial commitments that is to be settled or committed and or when the landowner has some social obligation to meet, "rent" is paid by farmers permitted to use land through help in various forms such as food, cash, physical labour and so on. This is the traditional method of covert "rent" payment.

The 3, 4, and 5-mile government blocks are of-course alienated land but, the problem as mentioned earlier is that, perhaps all the respondent farmers do not have lease-titles over the blocks they farm rice and staple food crops on. This may be a problem to long-term sustainability of rice cultivation in that area. It must be noted that the provincial DAL in Lae has approached the Lands Department on this issue since the survey and action towards proper titles being issued is being taken.

iii). Household Structure and Function

The Morobe Province is a patri-lineal society as is seen from the survey results. The head of the household is the father and he is the overall decision maker in the household.

In all the areas studied, family labour is adequate for most households for all the current and additional future farming activities, even after accounting for children over 12 years of age (the cut-off age below which individual child labour is not counted as being significant) currently attending school. On the average, each household has four fully available labour units per household for farming and other activities.

Table 7.6 shows percentage of households with different range of household numbers. Wareo has 20% of surveyed households with 2 or less members but has 80% households with between 3 to 6 members per household, 44% and 33% at Salodi, 20% and 60% at 3, 4 and 5-mile and, 30% and 50% at Poahum village respectively. Hence, it can be seen that household labour on the whole is adequate in the study areas.

Aggregated labour units distribution by age for households for each study area is also advantageous for farming activities. The age groups 13 to 20 and 21 to 35, the most productive age ranges for farm productivity has more labour units within these age range.

As in most parts of PNG, there is division of labour by sex. The study was not able to find out the division of labour by sex for specific tasks involved in any activity such as in gardening and house-building. One activity that clearly shows that there is gender specific activity was in marketing. It is the female members of households who do most of the sales of food crops at the market. Although it was not structured in the questionnaire, observations were that cash-crop processing and marketing is the domain of the male gender. Refer table 7.8.

iv). Farming Practises and Land use.

All areas surveyed practise shifting cultivation using slash and burn method but with the exception of the 3,4 and 5 mile farmers who are sedentary farmers, owing to the fact that there is no additional land for them to practise shifting cultivation.

Almost all farmers interviewed can be classed as semi-subsistence farmers because almost all respondents have their female family members selling food crops. Only one farmer does not sell food crops and this is the respondent who is a trade-store owner at Wareo village.

There are three main farming activities; the first and the main activity is food crops farming, rice farming is the next main activity and cash-cropping the last. In food crops farming, the main staples consisting of root-crops; sweet potato, taro (both Colacassia and Xanthosoma varieties) and tapioca and banana, mostly the cooking varieties are farmed. Food gardening takes precedence over other farming activities. Rice is the next crop of importance for all households interviewed and it is grown either as a mono-crop in Lae and Poahum areas or more often integrated with food-crops as in Wareo and Salodi villages.

Positive responses were recorded for rice farming having an effect on other activities. The major effect was felt in terms of time and labour required. The farmers had to accommodate rice farming as an additional activity by establishing a 'program' to accommodate its strain on their labour and time particularly in relation to food crops gardening. Although this was said, questions on number of gardens per household showed that rice farming had no impact on food crops gardening and that labour availability was not a problem at all.

It has been found that family labour units determine the number of gardens each household has. Some respondent households had more gardens than what the family is capable for based on the number of labour units available. The common answer, when asked that labour for respective families was viewed to be inadequate was that, they program themselves on their farming activities in relation to all other activities each household is engaged in and therefore, are able to have as many gardens as they want.

This is a bonus to rice farming, this sense of activity programming, as each family can program themselves for rice cultivation as well as food gardening of staples and cash-cropping must be highlighted in any rice promotional plans. Also, although farmers put food-crops gardening as a priority and rice farming as second priority, they are able to find the time and additional labour required with ease to plant rice/and be engaged in other activities as well.

v). Reasons for Rice Farming

The surveyed households all have an appreciation for and a need to grow rice. All farmers interviewed responded that they grow rice. Responses to three factors why farmers grow rice; like it, grow to eat it and cheaper to grow own rice, showed that, of the 40 farmers interviewed, 38 farmers (95%) grow to consume it and 18 farmers (45%) additionally felt that it is cheaper to grow ones own rice. Only three farmers (7.5%) responded that in addition to their growing rice for consumption, they grow it because they like local rice. Thirteen (13) farmers (32.5%) from Wareo and Salodi

responded that they grow rice because it is cheaper to grow their own, an indication of high trade-store prices for rice (Refer Table 7.7).

Table 7.7 Summary of Preferences and Attitudes Towards Most Preferred Activities and to Rice and Development Projects of Surveyed Households, Morobe Province.

	WAREO		SALODI		3,4 & 5 Mile		POAHUM		Total	
	No	%	No	%	No	%	No.	%	No	%
1. Gardening Vs Rice & Other Activities:										
- Yes	10	100	10	100	10	100	10	100	40	100
- No	0	0	0	0	0	0	0	0	0	0
- Total	10	100	10	100	10	100	10	100	40	100
2. Important Project:										
- A/Post	1	10	10	100	3	30	8	80	22	55.0
- Road	7	70	0	0	1	10	0	0	8	20.0
- School	2	20	0	0	6	60	2	20	10	25.0
Total	10	100	10	100	10	100	10	100	40	100.0
3. Why Grow Rice: *										
- Like it (Taste)	0	0	1	5	0	0	2	16.7	3	5.1
- Eat it (Food)	10	76.9	9	45	10	71.4	9	75.0	38	64.4
- Cheaper to grow (Cost)	3	23.1	10	50	4	28.6	1	8.3	18	30.5
Total	13	100	20	100	14	100	12	100	59	100
4. Community Co-Operation & Sharing:										
- Yes	10	100	10	100	10	100	10	100	40	100
- No	0	0	0	0	0	0	0	0	0	0
Total	10	100	10	100	10	100	10	100	40	100
5. Development in last 10 yrs.										
- Yes to	10	10	10	10	7	70	7	70	34	85
- No	0	0	0	0	3	30	3	30	6	15
Total	10	100	10	100	10	100	10	100	40	100

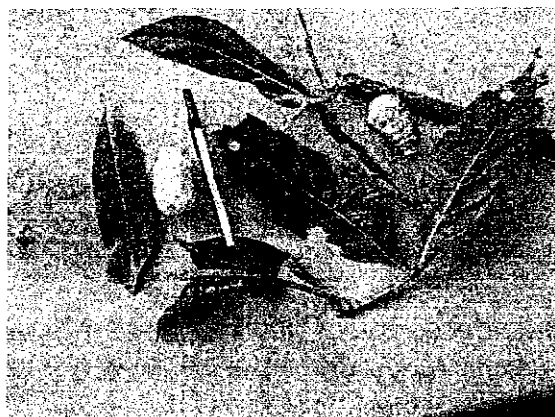
Note: (*) Double answers take totals to over 100% and total hencetotals are based on number of responses.

vi). Income-Earning Activities, Marketing and Household Incomes,

Income-Earning Activities

Income earning activities of the study areas comprise mostly of agriculture produce marketing, particularly of food crops and some cash crops. Table 7.8 below show that food-crops marketing are the main means of earning an income by almost all households in all areas surveyed. This is followed by sales of other agricultural commodities such as cash-crops such as coffee, income from other non-agricultural activities such as from trade-store operations (only one farmer at Wareo) and sawn timber (one case at Poahum).

Food-crops marketing is relatively easy and there are always buyers, particularly in the Lae urban and peri-urban markets. There are problems of marketing at the more rural areas such as the Wareo and Salodi villages. However, since this is the main income earning activity for farmers they are forced to manage with problems of unreliable transport unavailability as well as high transport fares that are charged.



Closeup of Noni fruits and leaves used as herbal medicine commonly found in the Momase region.

Table 7.8 : Summary of Farmers Farming Activities, Landuse, Marketing and, Marketing Problems of Surveyed Households, Morobe Province.

	WAREO		SALODI		3.4 & 5 Mile		POAHUM		Total	
	No	%	No	%	No	%	No	%	No.	%
1. No. of Gardens: - <2	0	0	0	0	3	30	2	20	5	12.5
(including rice) - 3 - 4	5	50	3	30	4	40	3	30	15	37.5
- 5 - 6	4	40	7	70	3	30	1	10	15	37.5
- >7	1	10	0	0	0	0	4	40	5	12.5
Total	10	100	10	100	10	100	10	100	40	100.0
2. Growing Rice:										
- Yes	10	100	10	100	10	100	7	70	37	92.5
- No	0	0	0	0	0	0	3	30	3	7.5
Total	10	100	10	100	10	100	10	100	40	100.0
3. Selling Food Crops :										
- Yes	9	90	10	100	10	100	9	90	38	95.0
- No	1	10	0	0	0	0	1	10	2	5.0
Total	10	100	10	100	10	100	10	100	40	100.00
4. (*)Type of Food Crops Sold:										
- Staples only	9	90	10	100	10	100	3	30	32	80.0
- Staple & Veges.	0	0	0	0	0	0	6	60	6	15.0
- Non-Seller	1	10	0	0	0	0	1	10	2	5.0
Total	10	100	10	100	10	100	10	100	40	100.00
5. Sold By:										
- Male	0	0	0	0	1	10	0	0	1	2.5
- Female	9	90	10	100	9	90	8	80	36	90.0
- Non Seller	1	10	0	0	0	0	1	10	2	5.0
- Youth Grp.	0	0	0	0	0	0	1	10	1	2.5
Total	10	100	10	100	10	100	10	100	40	100.0
6. Sales Problems:										
- High Transport Cost	10	100	10	100	0	0	9	90	29	54.7
- Low sales Price	10	100	3	30	0	0	0	0	13	24.5
- No Problem	0	0	0	0	10	100	1	10	11	20.8
Total	20	100	13	100	10	100	10	100	53	100.0

Source: JICA Smallholder Rice Promotion Study, 2002.

Note: (*) Staples are; sweet potato, taro (both types, local and chinese), Yam, tapioca and cooking bananas
 (** *) Total expenses are higher than 40 expected since multiplied answers were given.

7.2.8 Marketing Problems

As can be seen above, marketing is no problem in areas where roads are good and transport is regular and relatively cheap. Hence, most farmers in the 3, 4 and 5 - Mile area have no marketing problems. Poahum farmers cite high transport charges as a problem affecting transport of produce to urban and peri-urban markets in Lae.

In contrast, Wareo and Salodi farmers and for that matter, all other rural farmers find it very difficult to get produce to the market. Transport availability is poor to nil and cost of transport to the nearest service center and market is high (though the transport cost from Wareo and Salodi is not known, farmers expressed that fares are expensive).

Another problem of marketing was the issue of availability of buyers to buy cash-crops such as coffee, cocoa and copra. The low prices of commodities, coupled with high transport costs have deterred buyers from purchasing commodity crops and other cash-crops such as betel nuts from such areas as Wareo, Salodi and other areas of the Kotte LLG. Farmers mentioned that in the past, buyers came to buy betel nuts and other commodities but they no longer do so now.

vii). Economic Activities and Household Incomes

Levels of household incomes in the study areas are determined by engagement in economic activities and or remittances received from relatives working outside of the area. The main income-earning economic activities are food-crops marketing, some cash-crops marketing and, cash remittances from family members working in urban areas. In a few cases, apart from farming, farmers operate trade-stores and also engage in other non-agricultural activities such as logging and selling of sawn timber.

Wage employment is also available occasionally such as at Wareo and Salodi villages where the construction of the LLG Resource Center has created short-term job opportunity for the village carpenter and hire labour from the village.

Household income levels vary between areas, by the type of income earning activity each farmer is engaged in and the number of kinfolk working in urban areas who transmit remittances. All respondents were farmers but, it is these other difference such as; area setting (rural to urban or peri-urban and, rural to rural but with improved transport infrastructure and with improved accessibility for Poahum in comparison to Wareo) and other sources of income.

Income levels for most households interviewed are very low to moderate and there are only a few cases where respondents claimed that they have high to very high incomes per household per year but these are exceptions. Where these exceptions occur, it found that, these high household incomes stem from the fact that there are other sources of income other than farming. It was found that, remittances from next of kin working in towns, trade-store operations and, logging and timber sales account for these very high incomes. This is shown in Table 7.9 below.

Table 7.9: Household Incomes of Surveyed Households of Wareo, Salodi, 3, 4 & 5 - Mile and Poahum Areas in the Morobe Province

Level of Income (Kina/HH/year) :	Wareo		Salodi		3,4 & 5 Mile		Poahum		Total	
	No.	%	No	%	No.	%	No.	%	No.	%
Very Low : 0 - 20	2	20	0	0	2	20	0	0	4	10
Low : 21 - 40	2	20	2	20	2	20	1	10	7	17.5
Moderate: 41 - 100	3	30	6	60	4	40	2	20	15	37.5
High : 101 - 200	3	30	2	20	1	10	1	10	7	17.5
V. High : >200	0	0	0	0	1	10	6	60	7	17.5
Total	10	100	10	100	10	100	10	100	40	100.
									0	0

A wider range of household incomes but mostly at the high and very high levels is seen for the Lae and Poahum areas than the Wareo and Salodi areas. This expected as the latter areas are in the Lae urban and peri-urban area where these households enjoy the benefits of the services of a major urban center.

viii). Accessibility and Services Provision.

All the areas surveyed are accessible by all weather internal roads and for the Poahum area, the Lae to Bukawa road serves as the main road linking the survey area to the Lae urban center. The 3, 4 and 5 - mile area forms the periphery of Lae and therefore, accessibility is not a problem at all.

The Wareo and Salodi areas of the Kotte LLG area are not linked by road to Lae. These areas have a well maintained internal road network which links these areas to the Finschhafen (Gagidu) and Wasu stations. They are linked to Lae via a very reliable coastal shipping service provided by Lutheran Shipping and by air from Gagidu airstrip to Nadzab near Lae. Although the Wareo and Salodi respondents commented that transport availability and high freight costs are a problem, it is as expected in such remote areas where operation costs, particularly of fuel and parts for vehicles are especially high.

Services within the areas surveyed are more than adequate including the improvements made by the building of LLG Service Centers. These Service Centers will further improve the level of both social and economic services for all areas surveyed and also the surrounding communities.



Village people cooking breakfast for ACS Team at Wareo LLG Center in Finschhafen District, Morobe Province

ix). Community Self-help and Co-operation.

There is a prevailing sense of community spirit in all areas surveyed. Responses from all respondents were that, it is traditional to assist one another in any household and or community-related activity. They stated that, if any activity is beyond the capacity of any household, either immediate clan members or members of other clans would assist in any endeavour most often for free.

The same applies to any community-related work. Their responses were confirmed particularly at Wareo where the community has allocated customary land and assisted in the construction of the Kotte LLG Service Center for Wareo, Salodi and other nearby villages. They contributed timber and other locally available building materials as well. They know the difference between when an activity is for the common good and when and which activity is for personal gain and, they contribute their time, labour and even funds accordingly.

It must be noted that, it is a social norm throughout PNG, particularly in a rural setting and where customs and traditions are still strong to assist other members of the village or community and ones kin and kilt.

Individual property is another matter. There were negative responses from a few respondents regarding the use of tools and equipment by other farmers in the event that the other farmers lacked them but want its use. The impression was that and it was also mentioned by some of them that, they were only concerned over the safety of the tools or equipment that they may have or have been given the responsibility over. Hence, trust and responsibility over materials and equipment were the main concerns as these concerns matter in rural areas because of the cost and difficulty in obtaining such tools and equipment. Refer Tables 7.13 below.

x). Perceptions to development.

Throughout the surveyed areas, there is a prevailing sense of wanting development to happen, particularly in wanting social and economic services to be improved. Table

7.13 above shows that, most of the responses had indicated that, although there had been some developments in (100% of respondents) and these developments have been facilitated by various agencies, there is a need for up-grading, maintenance and general improvement. Respondents want upgrading and or maintenance in most existing developments such as roads (20% of all respondents), schools (25% of all respondents) and aid-posts (55% of respondents in all areas). Refer Tables 7.13 below

The question of "choice of the most important project" was not specific enough to differentiate whether responses were referring to existing projects' in need of upgrading or to a new project wanted by the respondent being interviewed.

All respondents of the surveyed areas want to grow rice and are pro smallholder rice development. Individual responses to why they want to grow rice, only 7.5% responded to taste but a massive 95% want rice cultivation because it is a food source and 45% responded to the cost considerations, that is, it is cheaper to grow their own rice. The total percentage is higher than 100% because some respondents who responded positively to wanting rice as a food-crop also responded positively to cost considerations (cheaper to grow their own rice) as well.

One of the main problems to rice promotion is the need felt by the surveyed households and the communities for proper cultivation, harvesting and milling tools and equipment. If farmers obtain these somehow, after assessing what households need and what is required by the community and then supplied to them, the rice promotion program in all surveyed areas in Morobe will be very successful.

Food-crops gardening is the main activity and in most cases, is the preference over rice cultivation as the sole farming activity for any household interviewed (refer Table 7.13, item1). However, the perception is that, farmers want to integrate rice into their farming system and land use practices, an additional farming activity for the households. This is simply because, people want to eat rice as a supplementary if not the main diet and, although not captured in the survey, it is the younger generation which prefers rice more to food-crops and this trend is growing with the increases in population.

7.2.9 Social Changes and Services

With regard to the study areas, development in transportation infrastructure through roads, shipping, air travel and general communications have generally brought changes in the social behavior and general community outlook.

Improvements in services in education, health, law and order and economic services in agriculture, business development and, transportation infrastructure are existing. However, they need maintenance and upgrading.

The current study has highlighted the fact that, with these general developments, changes such factors as in food preferences have occurred. The study area communities want rice as a basic food item and for its other attributes and prevailing socio-economic conditions including the fact that, it is a lot cheaper to grow rice themselves. However, the necessary information dissemination through extension, inputs supply, technology transfer and other factors that will entrench this change in social behavior, that is, change in food preference is not tenable at the present time.

It was felt by most households that since rice is high in demand in all areas surveyed and also that *imported rice is expensive and often not available at local tradestores*, it would be best to grow their own rice. They want to grow rice because it is very much preferred over food crop staples. They feel that it will not impact on their labour in relation to its availability for their many other activities.

The situation is much better for the Lae urban and peri-urban areas such as the surveyed areas of 3, 4 and 5 mile and Poahum village. In the Wareo and Salodi villages of the Kotte LLG area, such social and economic services are existing but the levels of service delivery is very low and are in need for improvement.

7.2.10 Economic Situation and Factors Affecting Rice Promotion

The current economic situation and its effects and the possible effects on rice promotion strategy that may be developed at the local level are discussed below. At the macro-level, the economic situation that affects macro-economy and its effect on imports, costs and other macro-factors that affect rice promotion is described in chapter 3, Socio-Economic Situation.

Cost related to importation, transportation, marketing (wholesaling, retailing), and finally to consumption are high. At the local level, the cost of imported rice itself is high. Added to this is the high cost of transporting rice by the local trade-store owner from the nearest retailer who also transfers his/her own transportation cost as well as his/her VAT (value added tax) and his profit margin. These costs are finally borne by the final purchaser the local villager who also pays for the final mark-up of the village trade-store owner. It is simply too costly at the village level for the simple farmer who may have no other means of earning an income to purchase imported rice due to this transfer of cost-pricing to someone who will least afford.

There are three main economic factors that are directly conducive to or create the conditions that are conducive to the promotion of rice. The first is the total cost of rice (prices) finally received at the end of the marketing chain - at the local trade-store. All the transfers in costs and profit margins, the total cost of which is eventually felt at the end of this chain of transfers is simply unaffordable. Supporting this assertion is that, a kilogram of "Roots" rice in Lae at a retail out-let may be at K2.00 per kg but is easily K3.00 at Wareo Trade Store and this is one of the cheapest imported rice brands in the market.

The second is the level of income earning opportunities that exist in each area. With improvements in services infrastructure, particularly roads, other services notably in agricultural and business development extension activity will improve. This will create income-earning opportunities that would facilitate changes in social behavior such as changes in food preferences and facilitate other developments. Without income, farmers will not be able to afford imported rice buy much needed farming tools or send children to school. It will create the condition economic for smallholder farmers to grow their own rice and this has been found to be true through this study.

The other factor, the problems of poor road infrastructure and poor extension service delivery, may affect promotion of smallholder rice in that extension staff, inputs supply and other services require good road systems for efficient and effective delivery.

The third main factor that is probably not conducive to rice promotion currently is that farmers, without other sources of income except from food crops marketing are not able to afford tools and equipment for all activities relating to rice. Proper tools and equipment are required for farmers to be engaged fully in rice development and these tools and equipment cannot be purchased because of the low household incomes in most surveyed areas. Additionally, travel to inputs supply centers is not affordable for most farmers and often there are no means (e.g. a vehicle and a road) to do so.

In a way, these negative economic factors have contributed to farmers growing rice to consume themselves and it is a boon for any smallholder rice promotion program to facilitate smallholder rice development at this point in time.

In terms of cash crops and related activities, the Wareo and Salodi area farmers grow a lot of arabica coffee as the main economic activity. Farmers stated that coffee has not been sold in recent times because of two factors. The first is that, commodity prices are low and therefore there is no incentive for them to sell coffee. The second is that coffee buyers do not travel to the area to buy coffee. In previous years, buyers bought parchment coffee from these villages but have ceased buying possibly due to low coffee prices and high transport costs. They also cited poor road conditions and lack of transportation to transport coffee to buying points on the coast.

7.2.11 Farmer's Organizations

The importance of farmer organizations and community based grass-roots organizations was raised in section 7.13 of this chapter and particularly in sub-section on community organization and participation.

There were very few farmers' organizations for various farming activities in the study areas. There were only three farmers groups mentioned by respondents in the study; the Ari Farmers' Group at 4-mile of Lae, a un-named Youth Group also in the same area and another un-named group at Poahum area. The Poahum area farmers' group was assisted by the ROC in 2000 to plant rice. After the first harvest, this group received no further assistance and therefore their venture into rice discontinued. Whether this group is still in existence and operating is not known.

It is vitally important for the success of the rice promotion program that such groups are identified and mobilized to participate in the rice promotion program in the future. This should be done for all Provinces considered for smallholder rice promotion in the future.

7.2.12 Land Rights

Land is a very contentious issue in PNG with most (about 97%) are lands under customary ownership and which have no clear guarantee of individual ownership. Alienated land or freehold land (about 3%) can be bought and sold, has market values and can be used as collateral for any loan commitments. Customary land on the contrary is seldom bought or sold and there is no formal markets for it and, has no standardized market values set for its sale. Also, land tenure is such that land is generally fragmented and scattered and, individual blocks are not of economic size for large-scale development on the same block of land.

Hence, difficulties are experienced in obtaining secure customary land for development of any kind. Access to investment finance is difficult owing to the fact that customary land cannot be offered as collateral. To add to this, the established land administration system is cumbersome and its administration is often difficult. This is the general scenario that may confront any investor in any development endeavour who might be using modern approaches to developing customary land.

The legal frame-work for the use of customary land is the use of lease-lease-back system, the Clan-Land Use Agreements or the incorporation of integrated land group.

Customary land is generally used through user-rights given to family and clan members, the clan being the family grouping which over-see such allocation. The use of customary land and tenure system is described in detail in section 7.2.3 and particularly in sub-section titled 'Land Tenure and Availability' above.

In the use of customary land for development such as rice cultivation, the approach to be used when using clan land should be the same the current approach taken for cash cropping such as for coffee and cocoa. As in subsistence gardening and in cash-cropping, individuals can use their user-rights to land to cultivate rice on a small scale given the fragmented and scattered nature of customary land.

7.2.13 Water Rights

Legally, water use and water rights come under the management of the State through the Water Resources Management Act (1982) and as administered by the Department of Environment and Conservation and the PNG Water Board.

However, similar customary land-ownership issues arise and the traditional and legal approaches taken over land and its use is also applied to the use of water and water rights. This should be considered because, the possibility of irrigating rice farms using water sources from customary land is connoted here. In that case, individual and claim use rights as described above also applies to water use and water rights.

7.2.14 Rural Credit Associations

This is an important area for consideration as it would ensure those individual farmers and farmers' groups that require funding to start projects may be able to mobilize their own funds for project development purposes. Where formal lending institutions are unable to lend due to their cost structures and lending policies, provision of micro-credit that is tailored to meet specific needs of rural farmers and which gives due consideration to the constraints under which farmers operate is an essential requirement for development. This has been found to be working for other developing countries in Asia and elsewhere and this has been possible through mobilizing financial capital through the formation of rural credit associations.

There are some Provinces in PNG which have funds for loan purposes and which is provided through the provincial governments for community development purposes. Other Provinces have Savings and Loans Societies and these operate by providing loans and savings on very favourable terms to its clientele, be it farmers or otherwise.

In late 1960s to early 1970s, many Savings and Loans Societies as well as Development Co-operatives were started by the government. These societies failed and were eventually abandoned for many reasons, one of which was poor management, poor understanding of the purposes for and knowledge of how to achieve the objectives of such societies.

During the study, the Study Team did not learn of any rural credit association or savings and loans societies in the study area. Perhaps this needs to be properly investigated for the other areas and districts in the province.

7.2.15 Summary

A. Introduction

Morobe Province is one of the three Provinces in the Momase Region. Morobe had been selected to be one of the five (5) Provinces for the Smallholder Rice Promotion Study on the basis of its long and continuous history of rice cultivation and consumption. It started since the early introduction of rice by Lutheran Missionaries at Finchhafen District, around the area of the study site, the Wareo and Salodi villages of the Kotte LLG Constituency.

Since then, it had continuously grown rice, mainly by smallholder farmers for their consumption through-out the Province. Main concentrations of rice cultivation areas are; the Markham Valley, the Morobe South Coast, the Bukaua and Nawae areas and the Pindiu and Finschhafen areas.

Both the national and Provincial Government interventions had concentrated around the Lae, Markham and Bukaua areas, with somewhat minimal assistance to the Morobe South Coast and the Finschhafen areas. The Morobe South Coast and the Finschhafen areas, upon analysis of the situation would show that, farmers in these areas have been and are truly committed to smallholder rice production on a continuous basis and for the long-term.

The current study was to identify smallholder farmers and their conditions with regard to rice production, consumption, marketing, and the general socio-economic conditions under which rural farmers operate. Below is a summary on the findings of the study, which also gives a general background of the province and its districts.

B. Background

Social Structure of Provincial Society

Political and Cultural - Linguistic Grouping.

Political Grouping

The Province is divided into nine (9) districts and they are; Wau - Bulolo, Menyamya, Lae, Huon, Nawae, Markham, Finschhafen, Kabwum and Tewai-Siassi Districts. These districts have nine headquarters and they are; Bulolo, Menyamya, Lae, Mutzin, Finschhafen (Dagidu), Kabwum, Salamaua, Bukaua, and Wasu Stations. The Morobe province occupies 33,525 km² of land area or some 7.24 % of PNG's total land area.

Cultural - Linguistic Grouping

District boundaries had been roughly defined along the lines of the cultural -linguistic groupings. The major ones, some of which had been used in education and the spread of the word of God and, as the main mode of communication are, the Kotte of Finschhafen, the Yabim of the Bukaua - Salamaua areas, the Markham, the Anga and the Biangai-Waria groups.

Population

The population of Morobe is at 307 000 or 7.6% of the total national rural population in 2000. Population growth rate is at 1.5% and has a low to moderate population densities. The exceptions are the Malai and Tuam Islands near Siassi Island which have 400 persons/km² while the Sialum coastal plains and the Kabwum District have a density of 105 persons/km². The Teptep and Snake Valley areas have a density of 70 persons/km². (NSO 2000 National Census figures)

Migration

The Lae urban and peri-urban areas have significant in-migration from within and out of the Province, the migrants seeking better services and employment opportunities. Menyamya, inland Salamaua, the Buang and the Huon Peninsula areas have seen very significant out-migration over the years.

Provision of Services and Accessibility

As much as most of PNG, many communities are located in small isolated pockets in mountainous areas where transport infrastructure is very limiting except by small aircraft which is the only form of transport bringing basic goods and services. High airfreight costs drive the cost of trade store goods high and also keep the returns on cash-crops low. The low-land coastal areas have better accessibility.

This generally results in low standards of living, poor accessibility to services and, restricts people's ability to access information and exert political and other influences. Consequently, communication and interaction within and between these groups are very poor to none at all.

Areas with good road networks have better accessibility to good services. Some of these are the Markham Valley and Lae District as well as the Bukaua, Buang and the Wau-Bulolo areas. Their advantage is in having major highways including the Highlands Highway and the Wau-Bulolo road running through them and connecting many other areas such as Menyamya and the Waria Valley and the Buang areas of Wau - Bulolo District. The Lae District is essentially urban in nature, harboring the Provincial Capital and, is the best developed in most aspects of development.

Income

Morobe is classified as having very low to low per capita income, which is between 0 - 20 kina to 21 - 40 kina, covering most of the rural areas. This is directly related to poor levels of infrastructure development and attendant provision of services infrastructure and, goods and services delivery in many areas of the province.

Some areas have moderate to high level of income, K41 to K100 to K101 to K200/person/year, and these areas have good roads and services infrastructure. Pockets of the Province such as the Lae urban District and the Markham Valley area along the Highlands Highway have very high incomes of more than K200 per capita.

Organizational Features of Rural Society.

Rural social structure and function in Morobe is no different from other parts of PNG which are based on clan and kinship basis, decision making is based on consensus using customs and traditions as guides. Also, leadership is not hereditary but achieved and where land, property and traditional rights transfers are patri-lineally based.

However, the advent of the modern system of government has seen to the establishment of various authorities, resulting in the introduction of complementing lateral power structures. These authorities have their representatives at the local level and these are the LLG councilors, the village court magistrates, the church and youth leaders and, the lower level public service officials, who with the traditional leader(s) also have decision making roles that affect social structure and function.

C. Survey Findings

1. Social Situation and Factors Affecting Rice Promotion

Main factors that may affect the promotion of the smallholder rice promotion program in the areas studied and by extrapolation, the rest of the Province, are summarized below. Information gained through interviews (and by general observation) is equal to the questionnaire structure and specific type of questions framed to be asked during interviews.

The study areas covered were: Wareo and Salodi villages of Kotte LLG, Finschhafen District; 3, 4 and 5 -Mile areas of Lae urban; and, Poahum area of Lae District.

Land Tenure, Availability and Land use

Land at Wareo and Salodi and some at Poahum are under customary ownership and tenure and applicable to all customary tenure requirements. Some lands at Poahum are part of the alienated freehold land given as part of the WWII reparations to Ex-Servicemen (RSL) of the Army. All land used by farmer respondents at 3, 4 and 5-mile are alienated lease-hold land, governed by their modern tenure statutory requirements.

Use of land in most of the areas is not a problem. The case of permitted use at Poahum by some farmers is not a problem currently as those permitted to use land are often related to each other one-way or other.

In most study areas, land and its availability as well as accessibility is not a problem. Farmers using leasehold land have a potential problem with the Department of Lands on probable illegal use and unpaid land-rent dues. Another problem is that, farmers in an urban setting get distracted by other equally, if not better projects and may not pursue rice cultivation alone, putting long-term prospects for rice in the area into jeopardy.

On customary land, land fragmentation and scattered nature of blocks perhaps poses problems of required size of holdings and the adequate number of gardens (commensurate with size of household) and travel distances to farm site for rice or any other development. However, rice promotion is aimed at smallholder farmers with subsistence orientation initially and hence, should follow the current subsistence gardening practise.

Labour and Its Availability.

Households in all areas studied have moderate to high household sizes with the average at five persons per family. From the analysis of the survey results particularly of household numbers engaged full-time in farming, number of gardens and relating to labour adequacy or inadequacy responses, it can be gauged that labour numbers and availability for each household in almost all areas is sufficient. This is given that, rice is an additional household activity and all respondents are current rice farmers.

Capital

In all areas and generally, tools and equipment as well as financial capital for any new investment is very limited indeed. This is because rural farm household incomes were found to be very low, with high propensity to spend (perhaps they do not have savings) and with no prospects for improvement in the near future.

Tools used for cultivation, harvesting and processing are mostly traditional and this alone is an indication of efficiencies and effectiveness of farming practise in the surveyed areas. There is a desperate need for financial capital, tools and equipment by farmers.



Manual threshing of rice by rice grower in 3 Mile Settlement – Loe. He is beating rice stalk on a wire mesh with plastic cover and tarpaulin below to collect grains.

Community Organization and Participation

There is evidence that the various communities of the study area are well organized and have a community *esprit de corps* prevailing. This is transmitted in the co-operative efforts in such situations as helping each other and constructing community wide service center facilities. An example is at Wareo and Salodi villages and the construction of their LLG services center.

Of little evidence was the existence and operation of grassroots organizations such as farmers' groups, women's group and rural credit associations. There was in-direct evidence of their existence in some areas and this needs further investigation, as these groups are essential to the bottom-up approach to any development endeavour.

Gender and Participation of Youth and Women

All the members of the household participate in routine farming and, household and community related activities. Gender differentiation in various activities is a norm in PNG's traditional society.

Within the requirements of any development activity such as the rice promotion program, is the requirement for equitable participation and whether existing organizations at the local level can be enabled and co-opted to participate. This is possible only if these grassroots organizations are identified and integrated into the rice promotion program at the commencement of the program.

Institutional Support

There is very little if not, no institutional support given to all rice farmers at Wareo and Salodi. Some degree of training, funding and input supply as well as processing assistance is given at Lae and Puahum areas by the following institutions; OISCA/JICA, NARI, ROC, DAL and Morobe Provincial Administration extension service.

Such assistance is required in other existing and potential rice growing areas throughout the Province.

2. Farmer Practises and Aspirations

This relates to specific practises of farmers and farming practice in the study areas. The findings are as below. Most of the main practises had been covered above.

Land-use Practises

Farming or gardening practise is traditional slash and burn and short fallow coined the shifting-cultivation method. Land is still not under pressure and, this method of cultivation is seen to be best suited at this point in time.

Fragmentation of land due to customary land tenure system forces farmers to have multiple gardens to compensate for size of holdings and yet satisfy household food need requirements.

Multiple crop gardening including rice is the practise with an average of five to six gardens being the norm in almost all study areas.

Household Structure and Function

All members of surveyed households see agriculture as the main activity. Food crops gardening is the main activity followed by rice farming and engagement in cash crop farming. Labour is structured along gender, for example, food-crops marketing is the responsibility of the female sex of the household.

Reasons for Growing Rice

Three judgment-based criteria viz.; like it (taste), eat it (as food) and, cheaper to grow own (cost consideration) was used to gauge the reasons for farmers growing rice. Study results showed that, most farmers grow rice as a *food supplement* (95%), followed by farmers with cost considerations (45%) and last by those with taste considerations. Total percentage value is higher than 100% because some farmers gave positive answers to one or two of the criteria.

Income-earning Activities and Household Incomes

There are not many income-earning activities in all the areas under the study. The main activity is food-crops marketing from which most farmers earn low to moderate levels of income, on the average, between K21 to K100 per household per month.

The basis for using the household as a unit of analysis regarding income is because in a rural setting, income earned is on the basis of household effort and expenditure is for the common good of the household.

Marketing Problems

Excepting farmers in Lae urban area, all farmers stated that cost of transport and reliability of transport availability are the main problems. Prices offered for farm produce was not a concern.

Low commodity prices and unreliability of buyers have also deterred farmers from engaging in cash-cropping activities.

Land and Water Rights

Land rights issue had been mentioned earlier but is governed by customary tenure and its requirements in its use of land and, in the case of alienated land, it is governed by the statutory requirements of the Lands Act and the Lands Administration system. There is a legal process used in the case of customary land viz.; Lease-lease-Back and Land Use Agreement for any developer who wants legal assurances to the use of customary land. However, situation with customary land is still fluid even then.

The same situation applies in the case of water and water-rights. The Water Resources Management Act (1982) governs all water resources but again the situation is also fluid when considering water resources on customary land.

However, traditional land owners using clan land pose no problems as individual farmers would be using their rights to land and water resources.

Table 7.10: Summary of Household Profile of Study Area, Morobe Province

	No. of Farmers by Sex		Households Size				Available HH Labour				HH Age Distribution					Main Occupation			Education Level (Gr., etc.)			
	M	F	≤2	3 - 4	5 - 6	≥7	≤2	3 - 4	5 - 6	≥7	≤12	13 - 20	21 - 35	36 - 50	≥ 51	Farmer	Govt. Worker	Other	NSL	TPS	CS	HS
No.	40	0	6	14	9	11	12	16	5	7	51	41	58	39	8	40	0	0	3	6	24	7
%	100	0	15	35	22.5	27.5	30	40	12.5	17.5	25.9	20.8	29.4	19.8	4.1	100	0	0	7.5	15	60	17.5

Source: JICA Smallholder Rice Promotion Study, 2002.

Table 7.11 Summary on Land Tenure, Morobe Province

	Own (*)	Inherited	Permitted use	Leasehold		Land Adequacy	
				Titled	Un-Titled	Yes	No
No	0	23	5	0	12	40	0
%	0	57.5	12.5	0	30	100	0

Note: (*) Own means land that is not inherited but purchased from others.

Table 7.12: Summary of Preferences and Attitudes Towards Rice and Development Projects of Surveyed Households, Morobe Province.

	Preferred Activities			Effect Rice on F/Gardening, Land & Labor		Important Projects				Why Grow Rice				Community Co-operation & Sharing		Development in the last 10 years	
	Cash crops	Food crops	Others*	Yes	No	A/Post	Road	Wharf	School	Like it (taste)	Eat it (food)	Cheaper (cost)	Sales (income)	Yes	No	Yes	No
No.	2	37	1	40	0	22	8	0	10	3	38	18	0	40	0	34	6
%	5	92.5	2.5	100	0	55	20	0	25	5.1	64.4	30.5	0	100	0	85	15

Source: JICA Smallholder Rice Promotion Study, 2002

Note: (*) the single farmer who prefers to operate his trade store more than food-crop gardening and cash-crop farming.

Table 7.13: Summary of Farmers' Farming Activities, Land-use, Marketing and Marketing Problems of Surveyed Households, Morobe Province

	No. of Gardens				Growing Rice		Selling Food Crops		Types of Crops Sold				Marketing food crops & sold by : Food crops				Marketing Problems (*)		
	≤2	3 - 4	5 - 6	≥ 7	Yes	No	Yes	No	Staples only	Staple & Cash Crop	C/Crop s only	Non-Sellers	M	F	Other *	Non-seller	Transport Cost/Avail.	Low Price	No Problem
No.	5	15	15	5	37	3	38	2	32	6	0	2	1	36	2	1	29	13	11
%	12.5	37.5	37.5	12.5	92.5	7	95	5	80	15	0	5	2.5	90	5	2.5	72.5	32.5	27.5

JICA Smallholder Rice Promotion Study, 2000.

Note: (*) denotes respondents engaged in non farm activities such as trade-store and saw-milling and sawn timber trading.

: (***) denotes that surveyed households gave more than one answer to marketing problems. Hence, number of responses is tallied and totals are by type of response and not by the total of 40 households interviewed.

Table 7.14: Household Incomes of Surveyed Households of Wareo and Salodi villages of Finschhafen District and 3, 4 & 5 - Mile Settlements and Poahum village of Lae District, Morobe Province

Level of Income (Kina/HH/year) :	Very Low: 0 - 20	Low : 21 - 40	Moderate: 41 - 100	High : 101 - 200	Very High : ≥ 200
No	4	7	15	7	7
%	10	17.5	37.5	17.5	17.5

Source: JICA Smallholder Rice Promotion Study, 2000

7.3 Madang Province

7.3.1 Introduction

Madang Province occupies 28 000 square kilometers in the central north of the PNG mainland. The six districts in the province are Bogia, Madang, Middle Ramu, Rai Coast, Sumkar and Usino-Bundi. The two districts chosen as case study areas were the Madang and the Usino-Bundi Districts. The estimated rural population of Madang in the year 2000 was 251 000. This is six percent of the national rural population. In terms of District breakdown of rural populations, Madang District had 34,000 people, while Usino-Bundi's rural population was estimated at 48, 000 in year 2000 (Hansen et.al, 2001).

A socio-economic survey of four villages in the Madang Province was conducted on their socio-economic situations. The villages included in this survey were Danaru, Umun, Lagaha and Sausi/Yakumba. Information related to the general characteristics of the surveyed households, number of people who belonged to different age groupings, sources of income generating activities, monthly income, farmers profile (gender, number of dependents, age and education) and farmers gardens (crops, land use and marketing practices) were the main areas of investigation. Surveyed data has been analysed and results of these are presented below.

A total of 40 farmers were surveyed in the four villages referred to below. Table 7.15 illustrates the general characteristics of the surveyed households. These include the main occupation of the respondents, number of respondents from each village, the average age of the farmers who were interviewed in each village, their average family size and the highest grade respondents completed in each of the surveyed villages. The Table shows that most of the respondents were farmers. Their average family size ranged from 4-8 people. The lowest of 4 people was for Lagaha village while the highest average family size was 8 for Umun. Furthermore, the highest grade farmers completed was Grade 10. There was only one respondent who had gone to a college.

7.3.2 Characteristics of Surveyed household

Table 7.15: General characteristics of the surveyed households

Village/Location	Main occupation	No. of respondents	Average age	Average family size	Highest grade completed
Danaru	Farmer	10	32	5	10
Umun	Farmer	10	39	8	10
Lagaha	Farmer	10	32	4	College
Sausi/Yakumbu	Farmer	11	25	5	10

Source: JICA Smallholder Rice Promotion Study, 2002

Table 7.16 shows the number of people in the different age grouping. Almost all the villages included in the survey show that a high number of people were below the age of 12 years. This pattern for population to cluster at the base of the age-sex pyramid is no different to many areas of the country. This pattern is also observed for many of the countries in the Third World. This pattern of where many people are below the age of 20 was also observed from data analysed on rice consumption surveys in both the rural and the urban of the four selected Provinces. This was because in some instances they were the same households interviewed when socio-economic survey was conducted.

For all the four villages surveyed, the total number of people enumerated was 192 of which 44.3 percent were below the age of 12 years. If these population is to include those which were below the age of 20 years, the percentage increases to 63 percent. This basically means that more than half of the surveyed village populations were young people. The proportion which fell in the age group defined as economically active population was 34 percent. The balance was above the age of 51 years.

When the proportion of population for each village who fall below the age of 20 years is computed a total of 67.3 percent was for Danaru, 61.2 for Umun and in Lagaha the proportion was 48.9 percent. In the case of Sausi/Yakumba it was 71.6 percent. This shows that more than half of the population was below the age of 20 years.

Table 7.16: Total number of people in the different age groupings of the surveyed households

Age group	Villages				Total	%
	Danaru	Umun	Lagaha	Sausi/Yakumbu		
Below 12 years	21	20	10	34	85	44.3
13-20	12	10	10	4	36	18.7
21-35	9	8	12	13	42	21.9
36-50	6	8	7	2	23	12.0
51+	1	3	2	-	6	3.1
Total:	49	49	41	53	196	-
%	2.5	25.5	21.4	27.6	-	100.1

Source: JICA Smallholder Rice Promotion Study, 2002

Table 7.17 below shows main sources of income for the households surveyed. It appeared from the results of the survey that the main source of cash generating revenue source was from the sale of garden food crops. These included taro, yams, cassava, greens and vegetables, bananas and some rice was also sold as well. Total amount of money generated on a monthly basis was less than K250. On the other hand households from Umun, and Lagaha villages earned their additional income from sale of cash crops. These include cocoa and coffee.

7.3.3 Main Sources of Income

Table 7.17: Main source of income per surveyed household

Income source	Danaru	Umun	Lagaha	Sausi/Yakumba
Food crop	10(10)	9(10)	10(10)	10(10)
Cash crop	-	1(10)	9(10)	-

Source: JICA Smallholder Rice Promotion Study, 2002

Values in the brackets are the total number of respondents from each village.

Table 7.18 is a summary of monthly income earned by the rural households included in the survey. In summary almost 84.8 percent of the households included in the survey earned less than K250. About 8.1 percent earned between K251-500 and only 8 percent earned more than K1000. The three households from Lagaha and Umun villages who indicated earning more than K500 is mainly derived from the sale of cocoa and coffee beans. Field survey results indicate that income derived from the sale of food crops was minimal while income earned from cash crops such as coffee and cocoa was much higher.

Table 7.18: Monthly income earned by members of the household surveyed.

Monthly income (Kina)	Danaru	Umun	Lagaha	Sausi/Yakumba	Total	%
Below 250	8	9	7	7	31	83.8
251-500	2	-	2	1	3	8.1
501-999	-	-	1	1	2	5.4
1000+	-	-	-	1	1	2.7
Total HHs.	10	9	10	10	37	100.0

Source: JICA Smallholder Rice Promotion Study, 2002

Table 7.19 below indicates sources of income and the amounts which were earned by 40 households included in the survey. Among all the four villages, households in Sausi/Yakumbu households included in the survey. Among all the four villages, households in Sausi/Yakumbu village earned slightly higher incomes than those of the other three villages. A total of K8 360 was generated by the four villages. This amount was derived from the sale of food crops and cash crops alone. Out of this total income, 85 percent (K7 140) came from the minor sales of food crops such as taro, yams, bananas, fruits and vegetables. A balance of 14.6 percent (K1 220) came from sales of cash crops. Major cash crops villagers sold was coffee and wet cocoa beans to local sellers at a price of K0.80 per kilo. Amount generated was minimal due to falling prices for cocoa and coffee. This problem was further compounded by bad road system in the area and high freight costs incurred by the passengers or sellers. For example, local villagers were paying a freight fee of K10.00 each way and at the same time, passenger fare of K7.00 to go to Madang town.

Highest education respondents had attained in the four case study villages was Primary education. This was derived from asking the question as to what were the highest education members of the household had completed. In this case almost 71.8 percent of the respondents indicated completing primary education, 25 percent said that they had completed secondary education while the balance of 2.6 percent had gone to a college.

Table 7.19: Farmers profile by gender, number of dependents, age and education

Village	Gender		Dependents			Age		Education		
	M	F	<2	3	>4	<30	>30	Pri.	Sec.	Col.
Danaru	10	-	-	-	10	1	9	6	4	-
Umun	10	-	-	1	9	-	9	9	1	-
Lagaha	10	-	3	3	4	2	7	8	1	-
Sausi	11	-	1	1	9	1	6	5	4	1
Total:	41	-	4	5	32	4	31	28	10	1
%	100	-	9.8	12.2	78.0	11.4	88.6	71.8	25.6	2.6

Source: JICA Smallholder Rice Promotion Study, 2002

Table 7.20 is a summary of land use patterns of the respondents in the case study villages. Particular attention was given to assessing the gardens of farmers with regard how many gardens they cultivated in any one year, main crops grown in the gardens, nature of the use of the land that is to say whether it was customary land and the nature of the ownership (father's land, mother's land, own land or land borrowed from other fellow villagers for use to cultivate food crops). Results from the case study villages suggest that land used for gardening practices was mainly customary owned. Majority of respondents indicated that the land used for gardening purposes belonged to them. Response to this is shown in Table 6, where a majority indicated that 86 percent (25 households) cultivated gardens on their own

land or was owned by their parents (father or mother). Only 14 percent was permissive land, which means that respondents had been given the user right but did not own the piece of land themselves. They vacated this land once food crops were harvested so that land was left to fallow.

Almost all the respondents of the field survey were male. A total of 41 households were included in the survey. It is clear from Table 7.19 that a majority of households had more than 4 dependents. For example, in the case of Danaru all the 10 households had more than 4 dependents. In both Umun and Sausi/Yakumbu villages it was 9, while Lagaha had 4 dependents. This observation is consistent with the national average, which is around 6 dependents per household. Thus in whole, 78 percent of the households in the 4 case study villages had more than 4 dependents and the rest of the balance of the percentage was for those households less than 4 dependents.

Respondents in the case study villages grow a wide variety of food crops. The main ones are bananas, yams, kaukau and taro. In term of percentage distribution 33 percent of the respondents indicated kaukau as the main food crop grown in their gardens, followed by bananas with 31 percent, yam 26 percent only 6 percent indicated growing taro in their gardens.

Some of these food crops were also sold for cash. Summaries related to these activities and the amounts generated are shown in Tables 7.20 and 7.21. The Table below clearly shows that there is a division of labour in relation to sale of food crops in the market. In a majority of cases females do marketing of food produce. Thus in this case study 95 percent were female sellers of food crops in the market. Only 5 percent of males sold garden food crops. This observation is no different to a majority of cases in the country. Women do most of the sales of food and other products in the markets.

There were problems associated with the sales of food in the local markets. Main problems which faced households in this regard was transport and prices received for the products. Respondents in the case study villages indicated that freight rates they paid for the delivery of their garden food to the market was high. This problem was further compounded by infrequent movements of passenger vehicles to the place of sale. About 53 percent of households indicated transport as a main problem, while only 47 percent indicated problems of price.

7.3.5 Gardening Practices

Table 7.20: Farmers gardens, crops, land use and marketing practices

Village	No. of gardens		Main food crops				Food seller		Garden land		Sales problem	
	≤3	≥3	Banana	Yam	Kaukau	Taro	M	F	own	Per	Tran	Price
Danaru	1	9	10	8	7	-	-	10	8	2	2	5
Umun	3	7	10	10	10	-	-	9	5	1	4	3
Lagaha	6	4	-	6	4	10	-	10	5	-	10	9
Sausi	3	8	9	7	10	-	2	10	7	1	4	1
Total	13	28	29	24	31	10	2	39	25	4	20	18
%	32	68	31	26	33	11	5	95	86	14	53	47

Source: JICA Smallholder Rice Promotion Study, 2002

Table 7.21 is a summary of land use patterns of the respondents in the case study villages. Particular attention was given to assessing the gardens of farmers with regard to the number of gardens they cultivated in any one year, main crops grown in the gardens, nature of the use of the land and whether the land was customary owned and the nature of its ownership (father's land, mother's land, own land or land borrowed from other fellow villagers for use to cultivate food crops). Results from the case study villages show that land used for gardening practices was mainly customary owned. Majority of respondents indicated that the land used for gardening purposes belonged to them. Response to this is shown in Table 7.22 where a majority indicated that (86 percent of 25 households) cultivated gardens on their own land or was owned by their parents (father or mother). Only 14 percent was permissive land, which means that respondents had been given the user right but did not own the piece of land themselves. They vacated this land once food crops were harvested so that land was left to fallow.

Respondents in the case study villages grew a wide variety of food crops. The main ones were bananas, yams, kaukau and taro. In terms of percentage distribution, 33 percent of the respondents indicated kaukau as the main food crop grown in their gardens, followed by bananas with 31 percent, yam 26 percent and only 6 percent indicated growing taro in their gardens.

Some of these food crops were sold for cash. Summaries related to these activities and the amounts generated are shown in Tables below. The Table below clearly shows that there was a division of labour in relation to sale of food crops in the market. In a majority of cases females marketed food produce. Thus in this case study, 95 percent were female sellers of food crops in the market. Only 5 percent of males sold garden food crops. This observation is no different to a majority of cases in the country. Women do most of the sales of food and other products in the markets.

It was also necessary to find out if there were any problems with transport and prices of food produce. Respondents in the case study villages indicated that freight rates they paid for the delivery of their garden food to the market was high. This problem was further compounded by infrequent movements of passenger vehicles to and from the villages and to the place of sale. About 53 percent of households indicated transport as a main problem, while only 47 percent indicated problems of price and not enough buyers.

7.3.6 Attitude to Development

Table 7.21: Farmers attitude to development and rice production

Village	Effect of rice on			Most important project			Reasons for growing rice			Communal sharing	
	Ga.	Lb.	Land	A/Pt.	Rd.	Sch.	Like it	Food	Exp.	Yes	No
Danaru	2	5	-	5	4	8	9	-	8	10	-
Umun	1	2	-	1	4	2	10	-	8	7	-
Lagaha	3	2	-	-	10	-	10	-	7	10	-
Sausi	2	6	1	5	5	5	11	-	9	11	-
Total:	8	15	1	11	23	15	40	-	32	38	-
%	33	63	4	22	47	31	56	-	44	100	

Source: JICA Smallholder Rice Promotion Study, 2002

Farmers attitude to development and rice farming was also important to include in this assessment. Effects of rice production on garden land, labour and land were useful indicators of socio-economic arrangement within the case study villages. Data presented in the Table above shows that there would be no direct effect on land as a result of rice cultivation. Majority of households indicated that land was not a major problem in the four case study villages. However, there would be problems with the availability of labour required to work on the rice farms and also be involved in gardening activities of the households. Others indicated that it was possible to reorganize family labour requirements between the two; that is gardening activities and rice production on a small-holder basis.

Aid post, road and a school were the most important development projects identified by the households in their respective villages. The summaries of the results of these surveys are given in Table 7.22 below. Thus, in terms of ranking projects, road was identified as the most important project with 47 percent, school was the second most important project (31 percent) followed by an aid post with 22 percent. Road was ranked most important because it helped the local farmers to transport their farm produce to the local markets and also improved their accessibility.

With regard to reasons for growing rice, many respondents grew it because the family liked it as their food item and found imported rice too expensive to purchase. About 44 percent of household's responses in this regard was related to the cost element. Furthermore, all respondents indicated communal sharing to be an important aspect of rice production. Many stated that working in a community was an everyday aspect of village life and if there was a need to assist other fellow villagers in rice related production activity, such as land preparation and planting, family members would certainly help.

Table 7.22 Farmers attitude to development and rice production

Village	Effect of rice on			Most important project			Reasons for growing rice		Communal sharing	
	Ga.	Lb.	Land	A/Pt.	Rd.	Sch.	Like it as food	Exp.	Yes	No
Danaru	2	5	-	5	4	8	9	8	10	-
Umun	1	2	-	1	4	2	10	8	7	-
Lagaha	3	2	-	-	10	-	10	7	10	-
Sausi	2	6	1	5	5	5	11	9	11	-
Total:	8	15	1	11	23	15	40	32	38	-
%	33	63	4	22	47	31	56	44	100	

Source: JICA Smallholder Rice Promotion Study, 2002

Ga. = Garden

Lb. = Labour

Rd. = Road

7.4 East Sepik Province

7.4.1 Social Structure of Provincial Society

7.4.1.1 Political and Cultural-Linguistic Grouping

The East Sepik Province is one of the three Provinces of the Momase Region. It has six (6) districts and these are; Ambunti – Dreikikir, Angoram, Maprik, Wewak, Wosera - Gaui, and Yangoru - Saussia Districts and their respective district headquarters are; Pagwi, Angoram, Mapri, Wewak, Yangoru towns and stations, with the Provincial headquarters at the township of Wewak on the coast. The East Sepik Province occupies 43 700 km² and is 7.4 % of the total land area of PNG.

There are many cultural-linguistic groups, in some areas leaning more towards racially different groups such as that at the Kairuru and Aua Islands off the Wewak Coast who are of the Micronesian stock in contrast to the majority Melanesian stock of the mainland. The major ones area identified along geographic lines and are the Kairuru - Aua Islands group, the Sepik River and Plains groups, the Ambunti and Dreikikir group, and those belonging to the mountains of the Central range, the Telefomin (the people) group.

7.4.1.2 Population

The rural population in the 2000 National Census estimates that the population of East Sepik is at 270 000, which is seven percent (7%) of the total national rural population total and, has a annual growth rate of 1.6%. Population densities in most areas are mainly low to moderate (1 – 20 to 21 – 60 persons per km²) excepting the around areas south of Maprik, in the Amogu valley, which has the highest density at 170 persons per km² while the Maprik area has an average of 80 persons per km². The islands off the coast of Wewak coast have 60 persons per km². The rest of the land area is either too mountainous or swampy and are unoccupied.

7.4.1.3 Migration Patterns

There is very significant out-migration from the Province; the highest out-migrations are mainly from the Sepik valley area around Ambunti. There are large Sepik Settlement communities in Madang, Lae, Wau and Bulolo, Rabaul and at the New Britain Oil Plam Estate in West New Britain that account for these out-migrations. (PNG Rural Development handbook, ANU, 2001).

7.4.1.4 Accessibility and Services Provision

Accessibility to goods and services by the population is generally good. The main Sepik highway runs through the Sepik Plain from Wewak to Maprik, connecting most districts and district centers, including the boarder areas of Sandaun Province. This main highway and its feeder road-networks run through heavily populated areas and, serves to provide basic goods and services including; marketing of cash-crops, transportation of trade-store goods to trade-stores in rural communities and, provide communication linkages and interaction between people. The Sepik River and its tributaries such as the Yuat River provide transport and communications and make accessibility easier by motorized boats and canoes.

7.4.1.5 Income

Land potential and cash-cropping activities and the level of transport infrastructure development, mainly roads; determine variations in income levels between districts and in areas within districts and therefore, accessibility to urban and rural service center markets. People around the Maprik Dreikir and Yangoru areas earn moderate incomes (41 – 100 kina per person per year) through sales of cash-crops such as coffee, cocoa, and food-crops whilst low incomes (21 – 40 kina/person/year) are earned by people from the Sepik Valley and the Wewak Coast from minor sale of food-crops, fish, fruits, betel nuts and mustard. Very low levels of income (0 – 20 kina/person/year) are by people of remoter parts of the Province such as those in and around the Central Range and in the remoter parts of the Sepik Valley. (PNG Rural Development Handbook, ANU, 2001).

7.4.2 Organizational Features of Rural Society

The rural society of East Sepik is much similar to that described for Morobe and Madang and is not worth repeating here. The main point is that rural social structure and function village communities are on a clan and kinship basis and leadership and all that leadership entails. A leader of a village or community is recognized through his personal achievement and, decision making is based on customs and traditions. Inheritance of land, property and other traditional rights transfers are patri-lineally based.

As in Morobe, Madang and other parts of PNG, the advent of the modern system of government and the establishment of various authorities has introduced complementing lateral power structures and functions at the local levels, the organization and function of which is represented by its representatives such as the LLG councilors, the village court magistrate, the church and youth leaders and, the lower level public service officials. Apart from the traditional leader(s) in the community, these other players also play a role in community social structure and function and decision-making processes.

7.4.3 Social Situation and Factors Affecting Rice Promotion

The background to social situation of traditional PNG society and in general, how this might affect rice promotion has been established in the discussion on the sociological situation of the Central and Morobe Provinces in this chapter (sections 7.1.3 and 7.2.3).

The main factors that may promote or hinder the promotion of rice in the study areas of the East Sepik Province are listed below. For full details on these factors, reference is to be made to sections 7.1.3 and 7.2.3 for both Central and Morobe Provinces respectively as the traditional society, its structure and function are similar. Also, in the following sociological situation analysis of the surveyed areas in the East Sepik Province, these main factors that may affect the smallholder rice promotion program are discussed.

The main factors that are envisaged to affect the rice promotion program are;

- i). land Tenure and Availability (land-rights, amount etc),
- ii). labour and Its Availability,
- iii). Community Organization and Participation,
- iv). Gender and Participation of Youth and Women and,
- v). Institutional Support.

7.4.4 Farmer Practices and Aspirations

Within JICA's TOR and scope of work for this study and particularly in relation to the socio-economic aspects, the survey team was to ask questions in ten (10) main areas as detailed for Central and Morobe Provinces.

The main objective was to assess and gauge views on the feasibility of promoting rice and its acceptability by farmers within farming systems. The result of the survey findings are to be documented and a Master Plan is eventually to be drafted from these findings.

The study methodology followed was much the same as that applied in Central, Morobe and Madang Provinces. Of the 40 households surveyed, the first twenty covered Ninganje and Warak villages of the Wewak District and the second twenty surveyed households were from Aupik and Waikakum villages of the Maprik District.

Following are the results of these surveys.

i) Community and Household Profile

All four surveyed villages were rural in their setting excepting their location, Ninganje is approximately twenty minutes northwest by a sealed road from Wewak Town and Warak village on Muschu Island is approximately thirty minutes by motorized dinghy also from Wewak. Aupik village is connected by a gravel road traveling south to Maprik and, Waikakum village is near Hayfield, along the main Sepik Highway and about ten kilometers south of Maprik.

Households range from two to 8 family members mostly, but some households have large household sizes, having ten (10) or more members. However, on the average, the surveyed areas have seven (7) members per household (55% of the households surveyed). There are spatial differences in household sizes as well. Coastal villages of Aupik and Warak of the Wewak District have very large household sizes in contrast to inland villages such as at Aupik and Waikakum of Maprik District.

All households surveyed are farming households, although some respondents have indicated dual preferences when asked about their most preferred activity; between food crops farming, cash-cropping and other activities.

Large farm household sizes do not mean that all households have all the labour available for farming or other activities. Available labour are those household members who are fully engaged in providing labour to household and community activities and who are at or beyond, in this case, thirteen and below fifty years of age.

In every household surveyed, there is a greater proportion of under 12-year age group than the older age ranges in all villages surveyed. In the four villages, the under 12 year age group account for 37% of the household population, followed by 21 to 35 year group at 20% and which is closely followed by both the 13 – 20 year and 36 to 50 year age groups, both at 19 % of the total surveyed household population.

In household education profile, there are no major differences between the villages surveyed. Most households have members who are educated and who have attained basic community schooling (57.5 % of the total households surveyed) followed by those who attained high school or higher education (25% of total household population surveyed). In contrast to Morobe and Madang Provinces, no member of any households surveyed has had “Tok-Ples Skul” education and the reason for this is not known.

Any form of literacy and numeracy is important in the physical and social development of any community. With a high proportion of the households in the survey retaining a high percentage of its educated members particularly the youths and young adults, development interventions may be a lot easier to introduce, understood and, support and participation in such development interventions would be inevitable once such support and participation is solicited. Refer to summary of household profiles in Table 7.4.1.

ii). Land tenure

Land tenure and land-use is very much similar to the rest of PNG with patri-lineal transfer of ownership and use, is clan-based and in most cases, an individual of respective clans having user-rights only.

All the villages surveyed are in a traditional rural setting and, land ownership, user-rights and land-use is as described above. There are very few cases of "permitted use" of land (only one such case at Aupik village) and no case of rented clan-land as every individual has a traditional right to the use of clan land. The case where a farmer had been permitted the use of land is because of marriage relations where, the farther-in-law of the groom granted permission for the son in-law to use land for what-ever. In such a situation, there is no true and permanent 'ownership' of land but is a case of user-right through permission only. When the son-inlaw considers any major developments on such land, he may have to seek the permission of the land-owning clan(s).

As in other areas of PNG, land in the four surveyed villages is most probably fragmented and hence, garden sizes are small (though not captured in the questions but observations were made) and on the average, most household having 3 to 4 gardens (50% of households) to account for shortfalls in production from one garden. All respondent farmers have at least one garden of rice.

There are no disputes over land and this may be a reflection of low land pressure due perhaps to; a low population density, abundant land availability, good community /inter-clan relationships or, any combination of these factors. The population density for Wewak District is moderate (40 – 60 persons per km²) moderate and perhaps land pressure is low but the Maprik area has a very high population density (70 persons per km²) and the lack of land disputes observed is due perhaps to good inter-clan and inter-community relationships.

There were no observed cases of the use of alienated government or alienated private land. All farmers interviewed use customary land for cultivation and other purposes.

Table 1: Summary of Household Structure (Age, Sex, No. of HH Members, and Occupation) of Surveyed Households, East Sepik Province.

	NINGANJE		WARAK		AUPIK		WAIKAKUM		Study Area Total	
	No	%	No	%	No	%	No	%	No	%
1. No. of Farmers By Sex:										
Male (*)	10	100	10	100	10	100	10	100	40	100
Female	0	0	0	0	0	0	0	0	0	0
Total	10	100	10	100	10	100	10	100	40	100
2. Household Size:										
≤ 2	0	0	0	0	1	10	0	0	1	2.5
3 - 4	1	10	2	20	2	20	0	0	5	12.5
5 - 6	4	40	4	40	2	20	2	20	12	30.0
≥ 7	5	50	4	40	5	50	8	80	22	55.0
Total	10	100	10	100	10	100	10	100	40	100
3. Household Labor Availability:										
≤ 2										
3 - 4	6	60	6	60	4	40	1	10	17	42.5
5 - 6	2	20	3	30	2	20	7	70	14	35.0
≥ 7	2	20	1	10	1	10	2	20	6	15.0
Total	0	0	0	0	3	30	0	0	3	7.5
	10	100	10	100	10	100	100	100	40	100
4. HH Age Distribution:										
≤ 12 Yr.	25	36.8	31	49.2	16	25.4	31	36	103	36.8
13 - 20 Yrs.	14	20.6	9	14.3	8	12.7	23	26.8	54	19.3
21 - 35 Yrs	10	14.7	10	15.9	23	36.5	14	16.3	57	20.4
36 - 50 Yrs	17	25	11	17.4	14	22.2	13	15.1	55	19.6
≥ 51 Yrs	2	2.9	2	3.2	2	3.2	5	5.8	11	3.9
Total	68	100	63	100	63	100	86	100	280	100
5. Main Occupation:										
Farmer	10	100	10	100	10	100	10	100	40	100
- Govt Worker	0	0	0	0	0	0	0	0	0	0
- Politician	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	10	100	10	100	10	100	10	100	40	100
6. Education Level: (*)										
- NSL	4	40	0	0	2	20	1	10	7	17.5
- TPS	0	0	0	0	0	0	0	0	0	0
- CS	6	60	8	80	2	20	7	70	23	57.5
HS & over	0	0	2	20	6	80	2	20	10	25.0
Total	10	100	10	100	10	100	10	100	40	100

Source: JICA Smallholder Rice Promotion Study, 2002.

Foot note: (*) Note that, since only the male heads of Households were interviewed, they are treated as the only farmers. All available labour/ members of the household are farmers.

NSL stands for Non School Leaver (no formal education)

TPS "Tok Ples Skul"

CS Community School

HS High School

iii) Household Structure and Function

The East Sepik Province has a patri-lineal society as is seen from the survey results. The head of the household is the male parent and he is the overall decision maker in the household.

In all the areas studied, family labour is considered by interviewed household as adequate to their labour requirements at an average of 2 labour units per household (42.5 % of respondents) while some households (35% of households) having 3 to 4 labour units. In a rural setting, there are many household, economic and community activities households are engaged in and where an outsider might consider that available labour units are not equal to

the activities each household is engaged in, but they manage somehow. This is perhaps related to the programming of their various activities, time and their available labour.

Hence, a judgment on the amount of labour units available and the number and nature of activities engaged in must be determined before selection of a model farmer is considered. Household size in aggregate numbers is not an accurate indication of labour units available.

Table 7.4.1 shows percentage of households with different range of household sizes and labour availability indications. On the whole, it can be seen that household labour is adequate.

Aggregated labour units distribution by age for households for each study area is also advantageous for farming activities. The age groups 13 to 20 and 21 to 35, the most productive age range for farm productivity has more labour units within this age range making up 39.7% of the households population.

As in most parts of PNG, there is division of labour by gender. The study was not able to find out the division of labour by gender for specific tasks involved in any activity such as in gardening and house-building. One activity that clearly shows that there is gender specific activity was in marketing. It is the females of households who do most of the sales of food crops at the market. Although it was not structured in the questionnaire, observations were that cash-crop processing and marketing is the domain of the male gender. Refer table 7.4.3.

iv) Farming Practises and Land use.

Farming of both food crops and cash-crops form the mainstream activities for households in the study areas. All areas surveyed practise shifting cultivation using slash and burn methods as the main farming practise. Almost all farmers interviewed can be classed as semi-subsistence farmers because almost all respondents have their female family members selling food crops. There is no real specialization by gender (formalized by customary practise in crops marketing) for this but, it is a common practice.

There are three main income earning farming activities; the first and the main activity is cash-crop farming followed by food crops farming, rice farming takes the third main activity. In food crops farming, the main staples are farmed and consists of root-crops; sweet potato, taro (both Colocassia and Xanthosoma varaeties) and tapioca and banana and which mostly the cooking varieties.

In terms of rice farming having an effect on other activities, the response was, yes and that the major effect was felt in terms of time and labour required. The farmers had to accommodate rice farming as an additional activity by establishing a 'program' to accommodate its strain on their labour and time particularly in relation to food crops gardening. Although this was said, questions on number of gardens per household showed that rice farming had no impact on food crops gardening and that labour availability was not a problem at all.

It has been found that family labour units determine the number of gardens each household has. However, some respondents have more gardens than what the family is capable for based on number of labour units available. The common answer, when asked that labour for respective families was inadequate was that, they program themselves on their farming activities in relation to all other activities each household is engaged.

This is a bonus to rice farming, this sense of activity programming, as each family can program themselves for rice cultivation as well as food gardening of staples and this must be highlighted in any rice promotional plans.

v). Reasons for Rice Farming

Table 7.4.2 shows the level of appreciation towards rice and rice cultivation. The surveyed households all have an appreciation for and a need to grow rice as seen by the fact that, all farmers interviewed responded that they grow rice. Responses to three factors why farmers grow rice; like it – towards taste consideration, grow to eat it – food consideration and, cheaper to grow own-rice – cost considerations, showed that of the 40 farmers interviewed, 37% of the respondents stated that it was cheaper to grow their own rice, 32% grow it as supplementary food item. A very low 7% grew rice for taste and 24% for marketing. Hence, the two responses; growing as a food-crop and growing for cost consideration can only mean that in both cases, their growing it is primarily for food. Hence, their cumulative percentage (68.9% of households surveyed) and based on on these two reasons for growing rice makes rice farming primarily a food-crop activity.

Table 7.4.2: Summary of Preferences and Attitudes Towards Most Preferred Activities and to Rice and Development Projects of Surveyed Households, East Sepik Province.

	NINGANJE		WARAK		AUIK		WAIKAKUM		Study Area Total	
	No	%	No	%	No	%	No	%	No	%
1. Preferred Activities:										
cash crops	10	100	9	90	8	80	9	90	36	90.0
Food crops	0	0	1	10	1	10	1	10	3	7.5
Other (*)	0	0	0	0	1	10	0	0	1	2.5
- Total	10	100	10	100	10	100	10	100	40	100
2. Effect- Rice on Gardening:										
- Yes	0	0	0	0	2	20	5	50	7	17.5
- No	10	100	10	100	8	80	5	50	33	82.5
- Total	10	100	10	100	10	100	10	100	40	
3. Important Project:										
- A/Post	0	0	1	10	5	50	6	60	12	30.0
- Road	10	100	0	0	2	20	4	40	16	40.0
- Wharf	0	0	5	50	0	0	0	0	5	12.5
- School	0	0	4	40	3	30	0	0	7	17.5
Total	10	100	10	100	10	100	10	100	40	100
4. Why Grow Rice: (**)										
- Like it (Taste)	1		0		2		3		6	6.7
- Eat it (Food)	6		5		8		10		29	32.2
- Cheaper to grow (Cost)	7		10		6		10		33	36.7
- Sales (Income)	8		3		7		4		22	24.4
Total	22	100	18	100	23	100	27	100	90	100
5. Community Co-Operation & Sharing:										
- Yes	10	100	10	100	10	100	10	100	10	100
- No	0	0	0	0	0	0	0	0	0	0
Total	10	100	10	100	10	100	10	100	10	100
6. Development in last 10 yrs.										
- Yes	7	70	5	50	7	70	10	100	29	72.5
- No	3	30	5	50	3	30	0	0	11	27.5
Total	10	100	10	100	10	100	10	100	40	100

Source: JICA Smallholder Rice Promotion Study, 2002.

Note : (*) Denotes farmers who are also engaged in other non-farm income earning or other activities which are equally important to them.

(**) Respondents gave multiple responses to why they grow rice; hence, totaling is not possible as response tallying exceeds 10, the total number of respondents in each village.

*Nienguanhe village-Wewak District
Principle consultant Mr. Takao Akutsu at discussing the importance of survey with community leaders & heads of farm households.*



vi) Income-Earning Activities, Marketing and Household Incomes,

Income-Earning Activities and Incomes

Income earning activities of the study areas comprise mostly of agriculture produce marketing, particularly cash-crops as the main activity followed by marketing of food crops. Table 7.4.3 below show that cash-crops marketing are the main means of earning an income by almost all households in all areas surveyed. This is followed by sales of food-crops staples; taro, bananas, yams and sweet potatoes and earn incomes from non-agricultural activities such as trade-store operations, village level construction and sawn timber (one case at Aupik).

In terms of cash-crops marketing, the buzz-word through-out the Sepik and particularly in the Maprik and Wewak Districts is vanilla. Vanilla cultivation, processing and marketing has taken-off and the province and the villages are leading in the Country as growers and exporters of vanilla beans at present.

Marketing of cash-crops is very easy with the level of marketing infrastructure development and the marketing linkages established through-out the Province. The Sepik Growers Association, Garamut Enterprises (a local Maprik public Company started by the former MP for Maprik, Sir Peter Lus) and numerous dealers in spices (particularly vanilla) and other cash-crops.

Vanilla exports have increased and consequently is increasing the level of income of the farmers in the two Districts surveyed. Maprik District is currently classified as having moderate per capita incomes (41 – 100 Kina/person/year) and Weawak Coast (which includes the villages of Ninganje and Warak on Muschu Island) having low per capita incomes (21 –40 kina/person/year). With the current surge in planting of vanilla and other cash-crops, per capita incomes will most certainly increase. The current study indicated that most households are on the higher scale income earners than classified. Most households earn high (30% of households surveyed) to very high (37.5% of households surveyed) incomes and indications are that, income earning capacities are on a up-ward swing. Although surveys were done with the household as the unit of measurement and not on a per capita

basis, the high to very high incomes earned by households in the surveyed villages indicate that, on a per capita basis, incomes will increase proportionately.

Food-crops marketing are relatively easy and there are always buyers, particularly in the Maprik, Hayfield and Wewak markets. There are problems of marketing for the more rural villages such as Aupik and to an extent Warak but it is mainly of a short-term nature as this is one of the main income earning activity particularly for the female gender, farmers are forced to manage with transport unreliability as well as high transport fares charged.

Table 3: Summary of Farmers Farming Activities, Landuse, Marketing and, Marketing Problems of Surveyed Households, East Sepik Province.

	NINGANJE		WARAK		AUIK		WAIKAKUM		Study Area	
	No.	%	No.	%	No.	%	No.	%	Total/Av. No.	%
1. No. of Gardens (including rice):										
- ≤ 2	3	30	3	30	4	40	3	30	13	32.5
- 3 - 4	5	50	7	70	5	50	4	40	21	52.5
- 5 - 6	1	10	0	0	1	10	3	30	5	12.5
- ≥ 7	1	10	0	0	0	0	0	0	1	2.5
Total	10	100	10	100	10	100	10	100	40	100
2. Growing Rice:										
- Yes	10	100	10		10	100	10	100	40	100
- No	0	0	0	0	0	0	0	0	0	0
Total	10	100	10		10	100	10	100	40	100
3. Selling Food Crops :										
- Yes	10	100	10	100	10	100	10	100	40	100
- No	0	0	0	0	0	0	0	0	0	0
Total	10	100	10	100	10	100	10	100	40	100
(*)Type of Crops Sold:										
- Staples only	0	0	0	0	0	0	0	0	0	0
- Staple & C/Crops.	10	100	10	100	10	100	10	100	40	100
- Other (betelnut etc)	0	0	0	0	0	0	0	0	0	0
- C/Crops only	0	0	0	0	0	0	0	0	0	0
- Total	10	100	10	100	10	100	10	100	40	100
5. Marketing By Type of Crop										
(a) Cash crops Sales & Gender :										
- Male	0	0	0	0	0	0	0	0	0	0
- Female	0	0	0	0	0	0	0	0	0	0
- Both (M & F)	10	100	10	100	10	100	10	100	40	100
- Non Seller	0	0	0	0	0	0	0	0	0	0
Total	10	100	10	100	10	100	10	100	40	100
Food crops Type & Gender:										
- Male	0	0	0	0	0	0	0	0	0	0
- Female	10	100	10	100	10	100	10	100	40	100
- Both (M/F)	0	0	0	0	0	0	0	0	0	0
- Non Seller	0	0	0	0	0	0	0	0	0	0
Total	10	100	10	100	10	100	10	100	40	100
6. Marketing Problems (**)										
Transport	10	66.7	10	50	6	54.5	10	58.8	36	54.1
- Low Sales Price	5	33.3	10	50	4	36.4	6	35.3	25	39.7
- No Problem	0	0	0	0	1	9.1	1	5.9	2	3.2
Total	15	100	20	100	11	100	17	100	63	100

Source: JICA Smallholder Rice Promotion Study, 2002.

Footnote: (*) Staples are; sweet potato, taro (both types, local and Chinese), Yam, tapioca and cooking bananas. Also note that food crops and betel nuts and mustard are often sold at the same time.

(**) Totals add-up to more than 10 because all respondents gave more than one answer to the question on marketing problems.

Marketing and Conditions of Marketing

In rural PNG, marketing is a function of many factors but main ones are; the level of transport infrastructure development, cost of transport, buyers and buying activity, farm-gate prices offered and product handling (processing, packaging etc.). Most areas in the East Sepik Province have good road infrastructure and marketing systems and, marketing of both cash and food crops is not difficult relative some other Provinces. Hence, unlike some rural areas in Morobe and Madang that were surveyed in this study, and which were found to be very isolated, the study areas in East Sepik are much better-off in terms of market infrastructure. They have access to most major urban centers including the Provincial capital of Wewak.

From this survey, it was found that the deciding factor is price for cash-crops, cost of transportation for both food and cash-crops and, transport availability. Hence, most farmers in the study area cite high transport charges and low commodity prices, particularly prices of traditional commodities; copra, cocoa, robusta coffee and rubber as being very low. Transport cost and transport unreliability is also a problem for farmers marketing food-crops.

The village of Warak on Muschu Island is affected most as accessibility to the Wewak market, though twenty minutes away by motorized dinghy experiences transportation cost to be very high at 7 to 8 kina (7 – 8 kina) per trip and, unreliability of dinghies. This is on top of the transport cost of produce for market, which are individually costed, bag-by-bag.

In contrast, Aupik and Waikakum farmers stated that transport unreliability and cost of transportation are main factors followed by low commodity prices. Their responses are recorded in table 3.

Another problem of marketing was the issue of unavailability of buyers to buy cash-crops such as coffee, cocoa and copra. The low prices of commodities, coupled with high transport costs have deterred buyers from purchasing commodity crops and other cash crops from farmers.

The only crop that is booming in development and trade is vanilla which according to a farmer at Aupik, goes at high farm-gate prices of K240 to K350 per kilogram of cured beans (respondent sold his 5kgs for a total of K1,700, that is at K340/kg). All respondents from all four villages under the survey are vanilla farmers as a consequence of high farm-gate prices.

vii) Economic Activities and Household Incomes

Household incomes in the study areas are determined by engagement in economic activities and or remittances received from relatives working out of the area. The main income earning economic activities are cash-crop marketing and food crops marketing.

Farmers do not hire themselves out for wages and those who are appointed as government officials (such as ward councilors, peace-officers and village court magistrates) receive only an allowances and such activity engagements, though important, are not viewed as a main-line responsibilities or for which labour is to be fully committed.

All respondents stated that they do not receive any cash remittances from family members working in town. In a few cases, apart from farming, farmers operate trade-stores and also engage in other non-agricultural activities such as logging and selling sawn timber and building and construction work in the villages.

Household Incomes.

Generally household income levels vary between areas as determined by various factors such as those mentioned above under marketing conditions section. From this study, it was observed that, households incomes in the study area are well distributed between villages and between areas, irrespective of whether that particular village is near a major township or road accessibility is poor or better.

Table 4 shows the income distribution pattern of households within villages, between villages and between areas of the study areas. It is seen that only one household (2.5%) out of forty households receive a very low monthly income of less than 20 kina per year while five (5) persons or 12.5% of the households have responded as earning low levels of income (K21 to K40 per household per month) and 17.5% of households earning moderate levels of income (41 – 100 kina per household per month). Table 4 shows that, if the results of this survey can be extrapolated across all the households of the Maprik and Wewak Districts then, the majority of the households are at the high and very high range of income earners (at K101 to K200 and greater than K200 per household per month).

Where these exceptions occur, it found that, these high household incomes stem from the fact that there are other sources of income other than farming. It was found that are remittances from next of kin working in town, trade-store operations and, logging and timber sales account for these very high incomes. This is shown in table 4 below.

Table 4: Household Incomes of Surveyed Households of Ninganje and Warak of Wewak District and Aupik and Waikakum of Maprik District, East Sepik Province.

Level of Income (Kina/HH/year) :	NINGANJE		WARAK		AUPIK		WAIKAKUM		Study Area Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Very Low : 0 - 20	0	0	0	0	0	0	1	10	1	2.5
Low : 21 – 40	1	10	1	10	2	20	1	10	5	12.5
Moderate: 41 – 100	1	10	1	10	2	20	3	30	7	17.5
High : 101 – 200	3	30	4	40	2	20	3	30	12	30
V. High : >200	5	50	4	40	4	40	2	20	15	37.5
Total	10	100	10	100	10	100	10	100	40	100

Source: JICA Rice Promotion Study, 2002.

A wide range of household incomes is prevalent through-out the surveyed areas but are mostly at the high and very high levels.

viii) Accessibility and Services Provision.

All the areas surveyed areas excepting Warak village on Muschu Island are accessible by all weather internal roads whilst accessibility Warak village by dinghy to the main service-center at Wewak and therefore, accessibility to services is not problem. Accessibility measured by the number of hours or days it takes to travel to the nearest service center means that all areas surveyed are less than a hour to less than three (3) hours away. Within the classification of AusAIDs Rural Development handbook, the surveyed areas are very accessible, Warak and Ninganje villages to Wewak service center about thirty minutes away and Aupik and Waikakum to Maprik also less than twenty minutes away and to Wewak, less than three hours away along the Sepik Highway.

Social and economic services within the areas surveyed are adequate including such services in education, health, law and order and the availability to government extension assistance programs.

In rice development, the National and Provincial DAL have a development and extension assistance program with its operational base at Maprik and Hayfield in the Maprik District. This program has been in existence since the national DAL's PIP program of the early 1990s, which the provincial DAL is continuing. They have a Provincial Rice Development Co-ordinator and his assistant based at Banik, out-side of Maprik, overseeing to rice development and rice mill operations in the Maprik and surrounding Districts.

The Hayfield rice-mill owned and operated by national DAL is the only major mill currently operating. They charge a minimal milling fee of 20 toea for every kilogram of un-husked rice for milling. This operation is very successful and therefore continues to provide this essential service to rice farmers.

However, farmers from as far as Aupik and beyond find it difficult to transport rice to Hayfield and after milling to return to their villages. The problem of transport availability, cost of transportation (cost for bags and the farmer) to the rice-mill and then back at the same cost and, not to mention the milling fees are killing incentive and continuity of rice farming by farmers. Interviews through this survey shows that indeed they want to grow rice but milling facilities and problems of transport is detrimental to increased production of rice and also the long-term continuity of rice cultivation.

Farmers are rational beings and if rice production and processing is a hassle although they need it as food and if there is a easier and less costly way of eating rice (e.g purchase it in trade-stores) then they would do that. With increasing incomes through sales of other commodities such as vanilla, households in the area could revert to purchasing of imported rice.

ix) Community Self-help and Co-operation.

There is a prevailing sense of community spirit in all areas surveyed. Responses from all respondents were that, it is traditional to assist one another in any household and or community-related activity. They stated that, if any activity is beyond the capacity of any household, either immediate clan members or members of other clans would assist in any endeavour. The same applies to any community-related work. They know the difference between when an activity is for the common good and when and which activity is for personal gain and, they contribute their time, labour and even expense accordingly.

It must be noted that, it is a social norm throughout PNG, particularly in a rural setting where customs and traditions are still strong to assist other members of the village or community and ones kinfolk.

Individual property is another matter. There were negative responses from a few respondents regarding the use of tools and equipment by other farmers in the event that the other farmers lacked them but want its use. The impression was that and it was also mentioned by some of them that, they were only concerned over the safety of the tools or equipment that they may have or have been given the responsibility over. Hence, trust and responsibility over materials and equipment were the main concerns as these concerns matter in rural areas because of the cost and difficulty in obtaining such tools and equipment.

x) Perceptions to development.

Unlike the other areas surveyed in the Momase Region and excepting Warak village off Wewak Coast, there is no sense of prevailing want for development to happen. The households surveyed stated that there have been developments within the area in the last 5 – 10 years (Table 2, 72.5% of households) and only stated that there is a need for up-grading particularly of health (17.5%) and road infrastructure (40%) already existing in these areas.

Households in Warak village on Muschu Island want a wharf (50% of households at Warak village or 12.5% of all households in the survey). It seems that with the services infrastructure already existing and the level of income being enjoyed, they simply want upgrading of existing services infrastructure, excepting households at Warak village.

All respondents of the surveyed areas grow rice and are pro smallholder rice development. Individual responses to why they want to grow rice, only 6.7% responded to taste, 32.2% want rice cultivation because it is a food source and 36.7% responded to cost considerations, that is, it is cheaper to grow own rice. The total number of responses per surveyed village is higher than 10 responses because some respondents who responded positively to wanting rice as a food-crop also responded positively to cost (cheaper to grow their own rice) and taste considerations as well.

One of the main problems to rice promotion is the need felt by the surveyed households and the communities for rice processing (threshing and milling) machines. If farmers obtain these somehow, after assessing what households need and what is required by the community and then supplied to them, the rice promotion program in all surveyed areas as well as other areas not surveyed in East Sepik will be very successful.

Food-crops gardening the second most preferred activity (7.5% of households) after cash-cropping (90% of households surveyed) and in most cases, is the preference over rice cultivation as the sole farming activity for any household interviewed (refer Table 2, item 1). The perception is that, farmers want to integrate rice into their farming system and land use practices, *an additional farming activity for the households. This is simply because, people want to eat rice as a supplementary diet, if not the main diet and, although not captured in the survey, it is the younger generation which prefers rice more to food-crops and this trend is growing with the increase in population.*

Social Changes and Services

Changes in social behaviour come about through development and other prevailing circumstances such as the attitudes of the people themselves. In particular, developments in particular developments in transport infrastructure and improvements in income and accessibility to main centers bring changes to the communities and villages. Such changes as in food preferences, mode of eating, in dressing and in short, in the mode of living are consequences of trends in development and change.

With regard to the study areas, developments in transportation infrastructure through roads and general communications improvements have generally brought changes in the social behavior and general community outlook. People want change and change for the better, they want what towns and cities offer in terms of social services that ensure better standards of living. They want to be ushered into the modern system of living.

In the study areas, services in education, health, law and order and economic services in agriculture, business development and, transportation infrastructure are existing. However, they need improvements. The situation is much better for the Maprik and Wewak Coast areas that were covered in this survey. It is places such as Warak village on Muschu Island and other islands off the Wewak Coast, such changes are occurring but relative to the other areas, at a slower pace. This is due to low accessibility and high cost of transportation services coupled with low levels of marketing services provision.

The current study has highlighted the fact that, with changes in food preferences, the study area communities want rice as a basic food item and for its other attributes and prevailing socio-economic conditions including the fact that, it is a lot cheaper to grow rice themselves.

However, the necessary information dissemination through extension, inputs supply, technology transfer and other factors that will entrench this change in social behavior, that is, change in food preference is not tenable at the present time.

Economic Situation and Factors Affecting Rice Promotion

This section had been treated in-depth earlier as a general part of this section (section 7.2). However, the current economic situation and its effects and the possible effects on rice promotion strategy that may be developed at the local level are discussed below. At the macro-level, the economic situation that affects macro-economy and its effect on imports, costs and other macro-factors that affect rice promotion is described in chapter 3, Socio-Economic Situation and sociological situation which might affect the rice promotion program has been discussed in chapter 7, sections 7.1 and 7.2.

Also, the background on the economic conditions and factors that might affect rice promotion had been well covered in sections 7.1.10 and 7.2.10. However, specific conditions that might affect rice promotion in the study areas and by extrapolation, the East Sepik are discussed below.

Costs related to importation, transportation, marketing (wholesaling, retailing), and finally to consumption are high. At the local level, the cost of imported rice itself is high. Added to this is the high cost of transporting rice by the local trade-store owner from the nearest retailer who also transfers his/her own transportation cost as well as his/her VAT (value added tax) and his profit margin. These costs are finally borne by the final purchaser the local villager who also pays for the final mark-up of the village trade-store owner. It is simply too costly at the village level for the simple farmer who may have no other means of earning an income to purchase imported rice due to this transfer of cost-pricing to someone who will least afford.

There are three main economic factors that are directly conducive to or create the conditions that are conducive to the promotion of rice. The first is the total cost of rice (prices) finally received at the end of the marketing chain - at the local trade-store. All the transfers in costs and profit margins, the total cost of which is eventually felt at the end of this chain of transfers and simply become unaffordable. Supporting this assertion is that, a kilogram of "Roots" rice in Lae at a retail out-let may be at K2.50 per kg but is easily K3.50 at Maprik and at Aupik, some ten (10) kilometers out, is at K4.00. Currently, Roots rice is one of the cheapest rice brands in the market.

The second is the level of income earning opportunities that exist in each area. With improvements in services infrastructure, particularly roads, other services notably in agricultural and business development extension activity will improve. This will create income-earning opportunities that would facilitate changes in social behavior such as changes in food preferences and facilitate other developments. Without income, farmers will not be able to afford imported rice. It may be creating a condition for smallholder farmers to grow their own rice and this has been found to be true through this study.

This factor, the problems of poor road infrastructure and poor extension service delivery, may affect promotion of smallholder rice in that extension staff, inputs supply and other services require good road systems for efficient effective delivery.

The third factor that is probably not conducive to rice promotion currently is that farmers, without other sources of income except food crops marketing are not able to afford tools and equipment for all activities relating to rice. Proper tools and equipment are require for farmers to be engaged fully in rice development and these tools and equipment cannot be purchased because of the low household incomes in most surveyed areas. Additionally,

excepting those farmers with easy access to Lae urban center, accessibility to supply centers is not affordable and often there are no means (e.g. a vehicle and a road) to do so.

In other cases, farmers involved in more lucrative cash-crops activities such as vanilla farming and trading will consider the opportunity costs and the relative advantages of rice farming to vanilla farming. Incomes earned from vanilla are very high (at about 200 to 300 kina per kilogram). Hence, on a kilogram to kilogram basis, 1 kg of vanilla is paying for the labour and time used many times more (perhaps 100 times) than a kg of rice on the shelves at the village store.

The above factor of opportunity cost of rice to vanilla and, the fact that farmers who engage themselves fully on cash-crops such as vanilla would still purchase rice if sold at the village still make it a attractive proposition for farmers who grow rice for food and as a source of cash income.

In a way these negative economic factors have contributed to farmers growing rice to consume themselves and it is a boon for any smallholder rice promotion program to facilitate smallholder rice development at this point in time.

Labour availability is factor to be considered particularly for areas with high out-migration trends such as Maprik, Abunti and the Sepik Valley areas. From the study it was found that available labour for farming for most households is somewhat limiting at 4 labour units or less (77.5% of all households). With increased number of household farming activities such as cash-cropping and rice cultivation, there might not be enough labour at all for food gardening and other myriad community and farming activities.

Other cash crops are grown such as robuta coffee, cocoa, coconut and rubber by farmers as supplementary economic activities. Currently prices for these commodities are low but should the prices increases dramatically as it did for vanilla due to some disaster in a major growing country, then farmers would go for that cash-crop.

One point is standing out very clearly, rice is very fast becoming a staple through-out the study area and in PNG, rice will still be consumed as long as consumers can afford it. If not it simply has to be grown for subsistence.

Farmer's Organizations

The importance of farmer organizations and community based grass-roots organizations was raised in section 7.2.3 of this chapter and particularly in sub-section on community organization and participation.

There were very few farmers' organizations for various farming activities in the study areas. This may be not true since the questionnaire did not have any questions on the aspect of farmers' organizations framed into it, an important aspect that should have been included. There were only one farmers group mentioned by respondents in the study at Ninganje village of Wewak District.

However, it well known that the Sepik Growers association, the umbrella organization for all Sepik farmers, is very active with representatives on many major commodity Boards such as the Copra Marketing Board, Cocoa Board, CIC Board and the Spices Industry Board. With such a lead organization in the agro-industry sub-sector as a leader in the Province, then there certainly must be grass-roots organizations which form the lower echelon of the Sepik Growers Association.

It is vitally important for the success of the rice promotion program that such groups are identified and mobilized to participate in the rice promotion program in the future. This should be done for all Provinces considered for smallholder rice promotion in the future.

Land Rights

Land is a very contentious issue in PNG with most lands (about 97%) under customary ownership and which has no clear guarantee of individual ownership. Alienated land or freehold land (about 3%) can be bought and sold, has market values and can be used as collateral for any loan commitments. Customary land on the contrary is seldom bought or sold and there is no formal markets for it and, has no standardized market values set for its sale. Also, land tenure is such that land is generally fragmented and scattered and, individual blocks are not of economic size for large-scale development on the same block of land.

Hence, difficulties are experienced in obtaining secure customary land for development of any kind. Access to investment finance is difficult owing to the fact that customary land cannot be offered as collateral. To add to this, the established land administration system is cumbersome and its administration is often difficult. This is the general scenario that may confront any investor in any development endeavour who might be using modern approaches to developing customary land.

The legal frame-work for the use of customary land is the use of lease-lease-back system, the Clan-Land Use Agreements or the incorporation of integrated land group.

Customary land is generally used through user-rights given to family and clan members, the clan being the family grouping which over-sees to such allocation. The use of customary land and tenure system is described in detail in section 7.2.3 and particularly in sub-section titled 'Land Tenure and Availability' above.

In the use of customary land for development such as rice cultivation, the approach to be used when using clan land should be the same the current approach taken for cash cropping such as for coffee and cocoa. As in subsistence gardening and in cash-cropping, individuals can use their user-rights to land to cultivate rice on a small scale given the fragmented and scattered nature of customary land.

Water Rights

Legally, water use and water rights come under the management of the State through the Water Management Act (1982) and as administered by the Department of Environment and Conservation and the PNG Water Board.

However, similar customary land-ownership issues arise and the traditional and legal approach taken over land and its use is also applied to the use of water and water rights. This is because, the possibility of irrigating rice farms using water sources from customary land is connoted here. In that case, user rights as described above also apply to water and water rights.

Rural Credit Associations

This is an important area for consideration to ensure those individual farmers and farmers' groups that require funding to start projects may be able to mobilize their own funds for project development purposes. Where formal lending institutions are unable to lend due to their cost structures and lending policies, provision of micro-credit that is tailored to meet specific needs of rural farmers and which gives due consideration to the constraints under which farmers operate is an essential requirement for development. This has been found to be working for other developing countries in Asia and elsewhere and this has been possible through mobilizing financial capital through the formation of rural credit associations.

There are some Provinces in PNG which have funds for loan purposes and which is provided through the provincial governments for community development purposes. Other Provinces have Savings and Loans Societies and these operate by providing loans and savings on very favourable terms to its clientele, be it farmers or otherwise.

In late 1960s to early 1970s, many Savings and Loans Societies as well as Development Co-operatives were started by the government. These societies failed and were eventually abandoned for many reasons, one of which was poor management, poor understanding of the purposes for and knowledge of how to achieve the objectives of such societies.

During the study, the Study Team did not learn of any rural credit association or savings and loans societies in the East Sepik Province. This requires further investigation.

7.4.5 Summary

Development and change has been an on-going experience for a long time for the people of the study area and the East Sepik Province as a whole. Households in the study area have indicated, from the survey results that, they appreciate development and change through development programs and projects particularly those that would improve their welfare. The requirements to facilitate development; transport and services infrastructure development are already in place but they need upgrading and maintenance. Also, the attitude and appreciation of the resident population of the studied areas is pro-development. They have readily integrated their subsistence economies into the modern economy through their engagement in income earning activities such as through cash-cropping, food-crops marketing and, it is within this context that the findings of the study for the introduction of small-holder rice promotion program is summarized below.

General Situation Regarding Rice in the Study Area

Households in the study areas have been growing rice for a long time now, particularly farmers in the Maprik area. They have been assisted since colonial times with cultivation machinery, milling and other machinery and seed as well as extension support. These assistance programs had been continued with the introduction of PIP programs by the national government and after its termination in the late 1990s, the Provincial Government has taken over the responsibility of continued extension support to the farmers. The interest in rice cultivation was initially as a supplementary food but is now quickly becoming a food staple and, the need to grow it as a food crop is growing. This need to grow rice is growing because of the high cost at local stores of imported rice. Hence, it is within this prevailing situation that this study had been conducted.

Social Situation

The social structure and function in the East Sepik and particularly the surveyed areas is much the same as the rest of PNG, which are patri-lineal, clan based with regard to resources ownership, rights over resource use, decision-making and leadership. Unlike the purely traditional society as in the pre-colonial times, current power structures are dual with the achievement based non-inherited traditional leadership structure on par with modern system of government and its representation at the community level by the civil servants and local councilors who also make decisions on issues affecting the communities.

Household Profiles – Structure and Function

The basic unit is the household or nuclear family unit with the head-being the male parent who is the overall decision maker regarding family well-being and the interaction with the rest of the clan and the community. Many activities are gender specific as shown in summary table, Table 1 below.

The household sizes of most households are large, at seven members or more (55% of households) while the next range is at five to six members per household (Summary Table 1 - 30% of all households).

Household Labour, Labour Distribution and Gender

All households surveyed in the East Sepik claimed that their labour requirements are adequate to their farming and other activities. Findings indicated that this might not be so since the number of activities engaged in by each household is higher than the available labour. On the average, each household has 2 available labour units with three to four gardens (52.5% of total households) and this, including the cash-cropping activities and which is the most preferred activity, makes the 2 available labour units per household inadequate.

There is disproportionate distribution of actually available labour for farming and other activities in each household. The household sizes are large but it was found that only two persons per household are the actual available labour (Summary Table1 - 42.5 % of households surveyed) while between 3 to 4 labour units were found to be available in other households (Summary Table 1 - 35% of households surveyed).

Age Distribution of Households

This disproportionate labour distribution within households is seen in the age distribution patterns of households. Children under twelve (12) years of age and those going to school, that is less than 12 years (36.8% of total number of the households) and between 13 and 20 years of age (19.3% of total number of the households) account for less than half (39.7% of total interviewed household population) of the total number of household members included in the surveyed. Hence, barring the 13 to 20 year age group who if they do not attend school and therefore are available labour units to the household, the age group 21 to 35 years of age and 36 to 50 years of age group accounting for 40% of the total number of members of all 40 households interviewed is all that is available on a full-time basis to the households.

Farming Activity

Through-out the surveyed areas, the main farming activities, in order of importance as indicated by farmer preference on their most important activities are; cash-cropping, food-crop farming and rice farming. A total of 21 households or 52.5 % of total households have between 3 to 4 food-crops gardens, which includes rice gardens. Other activities such as building and trade-store operations were not prevalent and were not considered as a main economic activity and, hired labour was not engaged in by any of the households interviewed. This is shown summary in table 2 below.

All households interviewed grow rice with 33% of households do so because it is cheaper to grow their own rice whilst 29% said it is a food-crop. Only 6% of households grow rice for taste consideration. Refer Summary table 2. All households stated that rice farming has no effect (labour and time availability) to the question of rice farming has an effect on food-crops and cash-crop farming activities.

Food Crops Produced

Generally, the main staples are; sweet potato, taro (both xanthosoma and colacasia), banana (mostly cooking types), yam and sago. These vary in predominance with area surveyed; Maprik area has yam and taro being the dominating food-crops whilst taro, banan and sago dominate in the Wewak area.

Land Tenure and Availability

All surveyed households in the East Sepik Province use customary land that is under customary tenure, bound by customary law regarding its use and the distribution of user-rights to clan and family members. Land is patri-lineally inherited and the male members of clans and families have control over its use.

Land is adequate and is readily available for farming at the present time. This was in response to question on land availability and also stated that there are no disputes over land and ownership issues. However, land availability maybe a problem in the future due to an increasing population and further increases in the number of farming activities, including rice and other cash-crops in the near future. One household at Waikakum village of Maprik District indicated that pressure on land would increase in the future but qualification on how this will come about (through population increase, increase in farming activities or both) was not specified.

Development Preferences

Development preferences varied with surveyed area but most (52.5% of households) preferred projects which relate to transportation infrastructure; roads preferred by 40% and 12.5% preferred a wharf while 30% preferred Aid-posts and general improvement in health services and 17.5% preferred improvement in educational facilities and construction of elementary schools.

Community Co-operation

All households preferred co-operation to non co-operation in community and farming activities. All households expressed that it is traditional to assist each other in community related or individual activities. It is common to reciprocate favours in community and farming related activities.

Table 1: Summary of Household Profile of Study Area, East Sepik Province

	No. of Farmers		Households Size				Available HH Labor				HH Age Distribution					Main Occupation			Education Level (Gr., etc.)			
	M	F	≤2	3-4	5-6	≥7	≤2	3-4	5-6	≥7	≤12	13-20	21-35	36-50	≥51	Farmer	Govt. Worker	Other	NSL	TPS	CS	HS
No.	40	0	1	5	12	22	17	14	6	3	103	54	57	55	11	40	0	0	7	0	23	10
%	100	0	2.5	12.5	30	55	42.5	35	15	7.5	36.8	19.3	20.4	19.6	3.9	100	0	0	17.5	0	57.5	25

Table 2: Summary of Preferences and Attitudes Towards Rice and Development Projects of Surveyed Households, East Sepik Province.

	Preferred Activities			Effect Rice on Gardening		Important Projects				Why Grow Rice				Community Co-operation & Sharing		Development in the last 10 years	
	Cash crops	Food crops	Others	Yes	No	A/Post	Road	Wharf	School	Like it	Eat it	Cheap	Sales	Yes	No	Yes	No
No.	36	3	1	7	33	12	16	5	7	6	29	33	22	10	0	29	11
%	90	7.5	2.5	17.5	82.5	30	40	12.5	17.5	6.7	32.2	36.7	24.4	100	0	72.5	27.5

Economic Situation

Rice was treated as a novelty food in the past but has since become a food staple for people of the study area as much as in towns and cities of PNG. Most of the rice eaten now is imported and with the devaluation of the Kina and the cost of transportation, taxes (10% VAT) and final mark-up at the local trade-store, rice is simply not affordable anymore.

Incomes

The study areas are classified as having very low to, low per capita incomes (0-20 to 21– 40 kina/person/year) for the Wewak District and the Maprik area as having moderate per capita incomes (41 – 100 kina/person/year). Rural Development Handbook (2000). On the household basis, it was found that household incomes are high to very high (101-200 and, ≥ 200 kina per household per month). The units of analysis; per person per year and per household per month can be compared but, even without doing the analysis to reconcile the two units of income measurement, the income levels of farm households surveyed are currently considered to be at a high to very high level for most households surveyed.

Household Income-Earning Activities

Households are engaged in three main economic activities; cash-crops production and marketing, food-crops production and marketing and, selling of fruits and nuts and, betel nuts and mustard. Cash-cropping activities include traditional commodities; cocoa, robusta coffee and coconut/copra. Vanilla is a newly introduced cash-crop which is becoming an important cash-crop earning households high incomes and which is displacing other commodities which farmers claim to be fetching low farm-gate prices.

Not many households are engaged in trade-store operations and hire out labour as a means of earning incomes. Only two heads of two households in the survey were employed as village court magistrate and peace-officer at Aupik village, receiving token monthly incomes as allowances. These were not full-time hired labour on a regular wage.

None of the households interviewed received any remittances from family members working out-side of the study area. Hence, total household incomes for all households did not include cash remittances.

Table 3: Summary of Farmers Farming Activities, Landuse, Marketing and Marketing Problems of Surveyed Households, East Sepik Province

	No. of Gardens				Growing Rice		Selling Food Crops		Types of Crops Sold				Marketing by crop Type: C/Crop			Food crops Marketing by Gender			Marketing Problems (*)		
	≤2	3 - 4	5 - 6	≥7	Yes	No	Yes	No	Staples only	Staple & Cash Crop	Others	C/Crops only	M	F	Both	M	F	Both	Transport	Low Sale Price	No Problem
No.	13	21	5	11	40	0	40	0	0	40	0	0	0	0	10	0	10	0			
%	32.5	52.5	12.5	27.5	100	0	100	0	0	100	0	0	0	0	10	0	10	0			

JICA Smallholder Rice Study, 2000.

Note: (*) denotes that surveyed households gave more than one answer to marketing problems. Hence, number of responses are tallied and totals are by type of response and not by the total of 40 households interviewed.

Table 4: Household Incomes of Surveyed Households of Ninganje and Warak of Wewak District and Aupik and Waikakum of Maprik District, East Sepik Province.

Level of Income (Kina/HH/year) :	Very Low : 0 - 20	Low : 21 - 40	Moderate: 41 - 100	High : 101 - 200	Very High : 101 - 200
No	1	5	7	12	15
%	2.5	12.5	17.5	30	37.5

Source: JICA Rice Promotion Study, 2000

Marketing and Marketing Conditions

Both cash-crops and food-crops are marketed. Cash-crops are sold on the road-sides to buyers or transported to buyers such as to the Sepik Growers in Wewak for commodities such as cocoa and coffee. Vanilla is mainly sold to main buyers at Maprik and or Wewak, farmers going there themselves. Many traditional cash-crops are not marketed, reason being that farm-gate prices are too low to interest them

Food-crops are sold at the nearest service center such as at Wewak for the Wewak District Villages surveyed and Maprik and Hayfield for the two villages in Maprik District surveyed.

Main problems of marketing are; un-reliable transport availability, high-cost of transportation (produce fees and fares), lack of buyers and, low prices for traditional cash-crop commodities.

Services Provision.

The level of services provided in the surveyed areas in the East Sepik; both social and economic, are good. There is existing transport infrastructure, transport availability and marketing systems in place which makes engagement in economic activities by households much easier relative to the other three Momase Provinces covered in this study.

Social services are equally good given the infrastructure network and the development secondary and tertiary service –center development such as Maprik town and Hayfield in the Maprik District.

Conclusion

The prospect for smallholder rice development using the concept of Model Farm Management Unit approach for the study area and for East Sepik is very good. Farmers in households surveyed have been growing rice for a long time and are knowledgeable with regard to rice cultivation, processing and appreciate rice for its properties as a food-crop. With increasing cost of imported rice and the ever-increasing importance of rice as a food staple for many farmers, all farmers in the study households want to continue rice growing now and in the future.

Hence, the above summary of the survey results show that, when the smallholder rice promotion program is introduced into the surveyed households, rice farming will readily be incorporated into their farming system as an important food-crop production activity as they are already engaged in it and for the same objective for which this program is set to achieve – ensuring food security at the farm-household level.

7.5 East New Britain Province

7.5.1 Social Structure of Provincial Society

7.5.1.1 Political and Cultural-Linguistic Grouping

East New Britain includes roughly 15 000 square kilometers of the island of New Britain, in the northeast of PNG. The estimated rural population of East New Britain in the year 2000 was 247 000, which is six percent of the national rural population. The areas chosen for this case study was Kokopo and the Rabaul Districts. Both districts are small and semi-urban in nature. Estimated rural population for the district in year 2000 was 92 000. Population density is 220 persons per square kilometer in the rural areas of both districts.

Four villages were selected in the case study in the East New Britain Province. They included Ngunguna, Raputup, Talvat-Sikut and Gelagela villages. A total of 40 households were

included in the survey. Household's responses which were analysed are presented in the discussion which follows.

Table 1 below shows general characteristics of the 40 households surveyed in the Rabaul and Kokopo Districts of the East New Britain Province. All respondents interviewed were subsistence farmers. Average age of the surveyed households ranged from 34 to 39 years, while in Gelagela it was 52 years. Average size of the families also differed and these differences are summarized below in Table 1. Furthermore, the highest level of education achieved by the respondents was grade 10 in the case of Raputput and college in the case of the other three villages.

Table 1: General characteristics of the surveyed households

Village	Main occupation	No. of households	Average age	Average family size	Highest grade completed
Ngunguna	Farmer	10	39	6	College
Raputput	Farmer	10	34	6	10
Talvat-Sikut	Farmer	10	39	4	College
Gelagela	Farmer	10	52	7	College

Table 2 indicates total number of people for all the three villages who fell in the different age groupings. About 32.9 percent of the people were below the age of 12 years, while 25.2 percent of the people were in the 21-35 years old age bracket.

Table 2: Total number of people in the different age groupings

Age group	Villages				Total	%
	Ngunguna	Raputput	Talvat-Sikut	Gelagela		
Below 12 years	29	21	8	11	69	32.9
13-20	12	9	1	16	38	18.1
21-35	10	16	15	12	53	25.2
36-50	8	9	3	13	33	15.7
51+	-	2	4	11	17	8.1
Total:	59	57	31	63	210	
%	28.1	27.1	14.8	30.0		100

The main sources of income for the households in the surveyed villages were generated from sale of food crops, cash crops, artifacts and hire of their labour/equipment. In the case of Gelagela, 8 households indicated earning their income from sale of food crops, 1 household earned its income from sale of cash crops and two from the sale of artifacts. In the case of Talvat-Sikut, 7 households earned income from the sale of food crop and 10 households in the case of Raputput. With regard to Ngunguna village, household's source of income is shown in Table 3.

Table 3: Main source of income per surveyed household

Income source	Villages			
	Gelagela	Talvat-Sikut	Raputput	Ngunguna
Food crop	8(10)	7(10)	10(10)	6(10)
Cash crop	1(10)	-	10(10)	9(10)
Artifacts	2(10)	-	2(10)	-
Hire of labour/equipment	-	1(10)	-	3(10)

Table 4 summarizes monthly income earned by the members of the household. A majority of the members of the household earned below K250 per month. In terms of percentage this is about 55.3 percent. About 31.6 percent earned more than K1000. This observation is different from the Madang's case, where a majority of the respondents earned less than K250.

In the case of the villages discussed below the reason for households income to be as high as this is due to the fact that family members are involved in the sale of cash crops such as coffee and cocoa. Results of the survey for the four case study villages revealed that revenue generated from the sale of cash crops was higher than from the sale of garden food crops. Furthermore, many respondents also hired out their household equipment or facilities such as lawn movers and cocoa/copra dryers at high prices.

Table 4: Monthly income earned by members of the household surveyed

Monthly income (Kina)	Villages				Total	%
	Gelagela	Talvat-Sikut	Raputput	Ngunguna		
Below 250	8	6	5	2	21	55.3
251-500	1	1	2	-	4	10.5
501-999	-	1	-	-	1	2.6
1000+	1	1	3	7	12	31.6
Total HHs.	10	9	10	9	38	100.0

Table 5 below summaries various sources of income earned by the households and the amounts which was generated from these activities. Comparing this with the four case study villages in the Madang Province, it is very clear that average income levels in Kokopo/Rabaul Districts was much higher. For example, while it was K8 360 per month for all households interviewed in the four villages of the Madang province, it was K47 154 for Kokopo/Rabaul Districts. Sources of income generating activities of households in the case study villages of Gelagela, Talvat-Sikut, Raputput and Ngunguna was more diversified. Households earned their income from minor sales of nuts and food crops such as taro, bananas, vegetables and betel nuts. On the other hand, cash crops included cocoa and copra. Sales of handicrafts such as mats for example were also main items sold under this category. In the case of the hire of labour/equipment, this also generated adequate sums of income for some households in Ngunguna in the Kokopo District.

Table 5: Sources of income and amount generated for surveyed households

Sources of income	Villages and amount generated (Kina)				
	Gelagela	Talvat-Sikut	Raputput	Ngunguna	Total (%)
Food crop	990	6095*	705	1 880	9 670 (20.5)
Cash crop	1 600	-	5 600	16 795	23 995 (50.9)
Sales of handicraft	150	-	740	-	8 90 (1.9)
Hire of equipment/labour	15	80	-	12 504	12 599 (26.7)
Income/month	2 755	6 175	7 045	31 179	47 154
Mean income/week	688.75	1543.80	1761.30	7794.80	11 788.5
Mean income/household	68.88	154.4	176.13	779.50	294.7
Total: (%)	2 755 (5.8)	6 175 (13.1)	7 045 (14.9)	31 179 (66.1)	47 154 (100)

* also includes sale of livestock by one household which fetched K550.

Table 6 indicates profile of farmers by sex, number of dependents of the households, their ages and the level of education they received. Total number of households included in this analysis was 38. This Table shows that a majority of the heads of household were males (36 households), while 2 were females. In relation to the number of dependents, 65 percent of the households had more than 4 dependents, while only 30 percent had less than 3. Furthermore, 90 percent of the household members were more than 30 years old.

On the side of education, 49 percent had reached primary school education, 43 percent secondary and only 9 percent had gone to a college.

Table 6: Farmers profile by gender, number of dependents, age and education

Village	Gender		Dependents			Age		Education		
	M	F	<2	3	>4	<30	>30	Pri.	Sec.	Col.
Ngunguna	9	1	2	-	8	-	10	6	2	1
Raputput	7	1	2	1	7	-	8	6	2	-
Talvat-Sikut	10	-	6	1	3	4	6	2	5	1
Gelagela	10	-	2	-	8	-	10	3	6	1
Total:	36	2	12	2	26	4	34	17	15	3
%	95	5	30	5	65	11	90	49	43	9

Table 7 relates to an analysis of farmer's gardens, types of crops grown in these gardens, their land use patterns and the marketing arrangements. In summary, 44 percent of the households had less than 3 gardens, while more than 56 percent had more than 3 gardens.

Table 7: Farmers gardens , crops, land use and marketing practices

Village	No. of gardens		Main food crops				Food seller		Garden land		Sales problem	
	<3	>3	B	T	K	T	M	F	Own	Pr.	Tpt	Pr
Ngunguna	2	8	10	10	10	-	-	7	5	2*	-	-
Raputput	3	7	10	-	10	-	-	9	3**	7	6	2
Talvat-Sikut	7	3	6	-	7	6	-	7	-	10	4	1
Gelagela	5	4	5	7	4	-	-	9	1	9#	-	-
Total:	17	22	31	17	31	6	-	32	9	28	10	3
%	44	56	33	18	33	6		100	24	76	77	23

B: Bananas

T: Taro

K: Kaukau

Two households rent land at Ngunguna village

** Three households purchased plantation land from the missionaries at Raputput

9 households currently own land on a leasehold at Gelagela

Table 8 is a summary of findings on farmers attitude to development and rice production. Firstly, effect of rice production on garden land, labour requirements and land availability for rice production was worth assessing. A majority of the households indicated that there would be no major disruption to their traditional mode of livelihood. For example, 36 percent of all the households interviewed in the four villages indicated that rice production would not affect garden land and other factors of production such as labour and land availability. In the case of the latter, one third of the total respondents of 40 households interviewed indicated that there was a lot of land already available. Thus household's intention to produce rice on a small holder basis was not seen as a major problem or threat on land or labour requirements and availability.

Secondly, when households were asked to rank the most important development projects in their village, about 37 percent of the total of 48 households interviewed in the four villages indicated aid post as most important, followed by a school with 34 percent and finally road with 29 percent.

Also when households were asked as to why they grew rice, 57 percent of all the 40 households interviewed indicated it was grown for household consumption because they found rice sold in the stores to be expensive. For example, imported rice was sold at K2.40 per kilogram in the surveyed villages.

As with regards to communal sharing, all 100 percent of the households stated they would help and were prepared to work with other rice growers in terms of land preparation, planting harvesting and milling. Giving assistance to other fellow villagers was considered a social investment in the sense that if the other family required assistance they would also help in turn. It was the principal of reciprocity.

Table 8: Farmers attitude to development and rice production

Village	Effect of rice on:			Most important project			Reason for growing rice		Communal sharing	
	G	LR	Land	A/Post	Road	Sch.	Like it as food	Exp.	Yes	No
Ngunguna	2	2	-	2	5	1	10	10	9	-
Raputput	3	3	-	4	2	4	10	10	10	-
Talvat-Sikut	3	3	5	4	2	4	10	-	4	-
Gelagela	2	1	4	4	2	4	9	9	5	-
Total:	10	9	9	14	11	13	39	29	28	-
%	36	32	32	37	29	34	57	43	100	-

G: Garden
 LR: Labour
 L: Land