# Saninten Village

# Quantitative Analysis of Livelihoods



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**International Development Research Centre (IDRC)**

based on research conducted in collaboration with LATIN, Indonesia

# Table of Contents

# List of Figures

# List of Tables

## 1.0  INTRODUCTION

The following statistical analysis represents the second output of a comprehensive research project concerned with the linkages between micro-level livelihood realities as they exist for local households and the macro-level policy and institutional context established and enforced by dominant regional, national, and international forces.  The project is based on a case study of Saninten village in western Java, Indonesia where the collaborating research partner, LATIN, has been pursuing on-going work in community planning and participatory action research for good forest governance.

### 1.1.  The Livelihoods Framework

The conceptual foundation for this research project is provided by a livelihoods framework (Figure 1) that sets out several contentions and relationships. Individuals and households draw upon their available **assets** (natural, human, physical, financial, social) to engage in **activities** (farm, off-farm, non-farm) which in turn generate an '**income**' (goods, services, cash).  This simple core model lies at the heart of poverty reduction as it encapsulates the ultimate need for households to have the capacity to participate in productive activities that enable them to generate an adequate and secure standard of living (Ellis, 2001).

This apparently simple exchange involving the utilization of assets to produce an income through the medium of a livelihood activity is of course incredibly complex in reality.  Livelihood security and success is continually mediated by a great number of external forces beyond the immediate control of the household. These forces are critical in defining the basic structure and operation of livelihood systems, and their dynamic nature create the conditions whereby livelihoods change through coping or adaptation (Soussan et al, 2001).

While external forces can take on many forms, such as the 'shock' of a natural disaster which destroys productive assets or the long-term 'trend' of consistently declining market prices which limits net incomes, the focus of the current research is upon the **policy and institutional environment** both within and outside the local community.  The emphasis given to these factors is based on several key assertions.  First, policy and institutions have a clearly pervasive and fundamental influence on the nature of livelihoods, shaping the capacity of households to gain **access** to assets and activities.  For example, the rules, regulations and laws of land tenure are crucial in determining access to land ('natural capital'), which in turn critically shapes rural livelihoods.

Second, the policy and institutional context is an area where significant and sustainable change can be feasibly affected in support of livelihoods.  Local institutional structures, which are powerful in their direct contact and sustained presence, can be created or reformed to enhance livelihoods. This is not to deny the often rigid nature of local customs, traditions, and social relations but to

highlight the potential for local institutional change evident from many positive experiences with community-based initiatives.  External policy and institutions, while often even more difficult to alter, are nevertheless vital target areas for

**Figure 1. The Livelihoods Model**
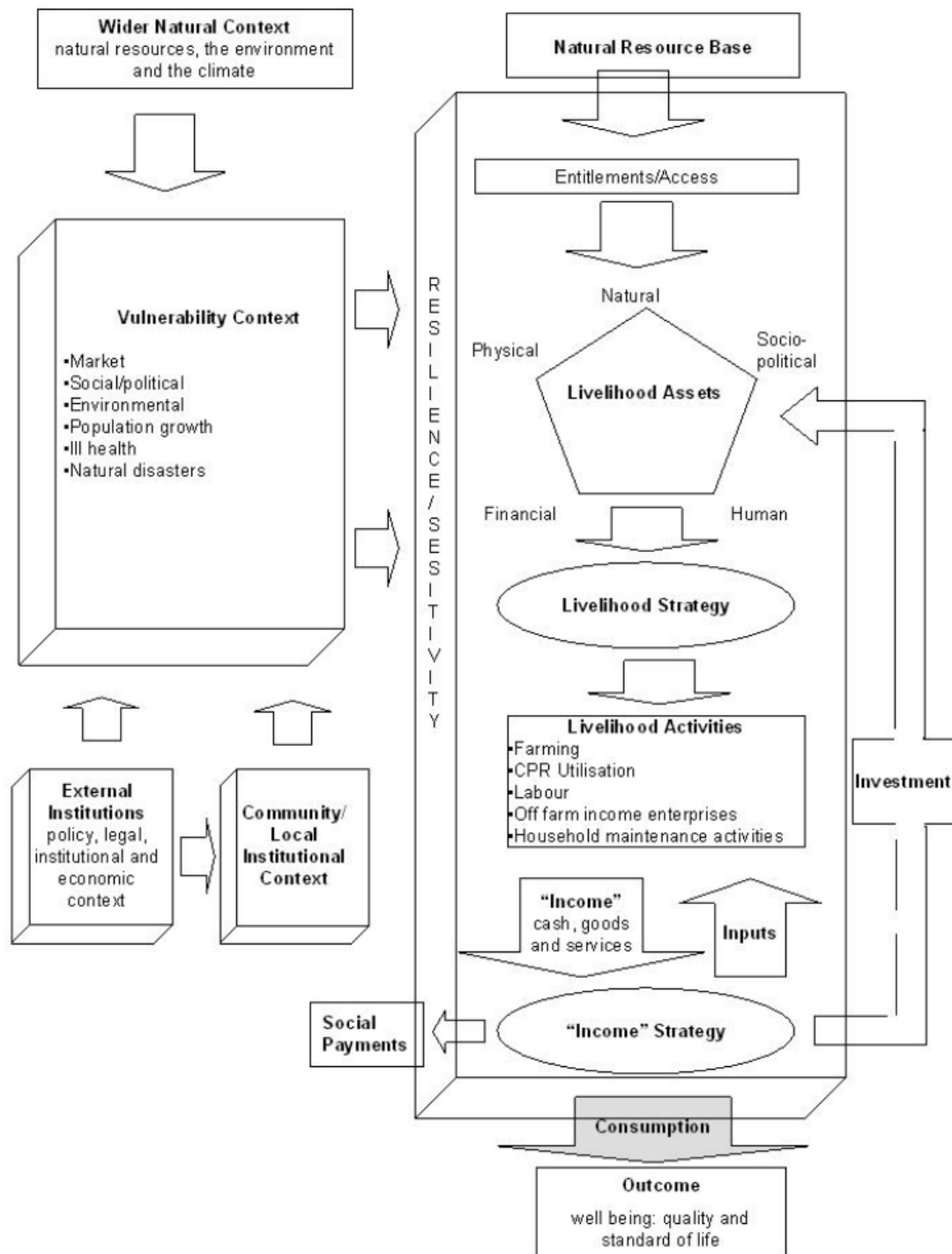
achieving sustainable livelihoods, as evident from a growing emphasis on generating policy influence from research results. Moreover, the central structures in the external policy environment – government and civil society – have definite, although contested, accountabilities that provide a firm basis for advocacy in the name of improved livelihood support and poverty reduction.

Finally, policy and institutions are absolutely key to Joint Forest Management (JFM) and forest governance, which are central issues for both LATIN programming and the livelihoods of Saninten village themselves.  As was the case with other forest-adjacent communities in Indonesia, particularly in Java, local people from Saninten began accessing the state-owned forest land that lies within their village boundaries as early as 1997 through a 'Social Forestry' program.  Since that time local people have been enmeshed in an incremental process of negotiating use and management terms with the state forestry corporation, Perhutani, through an official JFM program* and mediated by NGOs such as LATIN.  Exploring the relationship between forest-based livelihoods and the policy and institutions that mediate their success is therefore a central focus of the research.

## 1.2.  Research Goals

The overall goals of this research are as follows:

- to examine in detail the livelihoods (assets, activities, incomes) of Saninten households
- to understand the policy and institutional context of livelihoods at the village level with emphasis on the factors that limit access to key assets
- to understand the policy and institutional context of livelihoods at the external level (state and civil society)
- to make micro-macro linkages between local livelihood realities and external policy and institutions

The research process can be divided into two major components – fieldwork and a literature review of relevant policy documents. The first component is further divided into the collection of qualitative data through focus group discussions and informal key informant interviews and the collection of quantitative data using a sample survey.  The current report summarizes findings from the quantitative-based fieldwork, providing a basic set of statistics arising from the sample survey work conducted in Saninten village.  An earlier paper presented a thorough analysis of qualitative data.  Reference should be made to this 'Village Report' to gain clearer insight into the details of livelihoods (assets, activities, institutions, and so on) and other conditions in Saninten village.  A latter paper will provide a synthesis analysis of micro-macro links.

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* In Bahasa Indonesian, the program is known as PHBM (Pengelolaan Hutan Berbasis Masyarakat), which can be translated as Community-Based Forest Management

## 1.3.  Overview of the Sample Survey

The sample survey was an essential methodological tool used to respond to the central objectives of the research.  Specifically, the survey provided a means of collecting quantitative data on assets ('natural' and 'human capital'), activities, and incomes.  As such, it was a highly effective method of generating an accurate picture of village livelihoods and their significant diversity.  Moreover, it allowed the research team to examine the critical issue of the impact of Joint Forest Management and the granting of access to 'Perhutani land' that it has entailed for the livelihoods of Saninten households.

The research site was selected in collaboration with the host partner, LATIN, based upon parallel interests.  Saninten village is located in sub-district (*Kecamatan*) Kaduhejo, district (*Kabupaten*) Pandeglang, Banten province in western Java.  The community is situated upon a slope of the mountain *Gunung Karang* and contains a total of 568.2 hectares of privately-owned 'village land' and 303.87 hectares of state-owned 'Perhutani land'.  The basic livelihood system is agro-forestry, which integrates the cultivation of bananas and coffee with a variety of large trees.

The sampling employed for the survey was a systematic random technique based upon a complete sample frame of all village households provided by census data.  First, the total number of households was verified as 813.  Second, the research team decided that they would contact a total of 40 households, given the feasibility of administering the questionnaires relative to the limited amount of time for the fieldwork.  Third, a sampling interval of 20 was generated by dividing the population size (813) by the selected sample size (40).  Then the team simply selected every 20th household in the sample frame to produce a list of 40 households that would make up the sample respondents. Of these initially sampled households, three were unavailable to participate and thus were replaced by selecting the next immediate household in the sample frame.  As well, a single respondent with unusually high land ownership and agro-forestry incomes is generally excluded from analysis since it unreasonably skews results.

The random nature of the sampling process means that certain inferences can be drawn about the general village population.  In terms of statistical represent-ativeness, the sample size provides the quantitative results with a 95% confidence level and a confidence interval of 15.  While the latter may be somewhat high compared to standard sampling figures, the team is assured that the sample represents an accurate picture of village livelihoods.

## 1.4.  Selected Statistical and Asset Definitions

| Acronym | Full Name | Description |
|---|---|---|
| EAAs | Economically Active Adults | Household members aged 15-60 years, regardless of gender, but excluding those still in education |
| AEUs | Adult Equivalent Units | Based on consumption: male 15 years or older = 1; female 15 years or older = 0.8; male or female 14 years or under = 0.5 |
|  | Income Terciles | Calculated by ranking households from highest to lowest on the basis of total household income. Terciles each contain 13 households for a total of 39. *Terciles do not include a single household whose extreme wealth and land ownerships unreasonably skew results. |
|  | Income Category | Separation of households based on total household income ranges: 'Poor' (21 HHs) = Rp 5 million or less 'Middle' (14 HHs) = Rp 5 – 12 million 'Wealthy' (4 HHs) = more than Rp 12 million *Again, a single 'extreme wealthy' household is not included. |
|  | Land | Area owned in hectares |
|  | Education | Household total years in education for resident EAAs. Education level reached taken as proxy for years on basis of None=0; SD=6; SMP=3. |

## 2.0  BASIC DATA

The sampling procedure was very effective at gaining an accurate representation of households by the thirteen *Kampungs* of the village, as can be seen by comparing the distribution of sample households by this variable (Figure 2) compared to the distribution of the total population (Figure 3).

**Figure 2. Distribution of Sample Households by *Kampung***
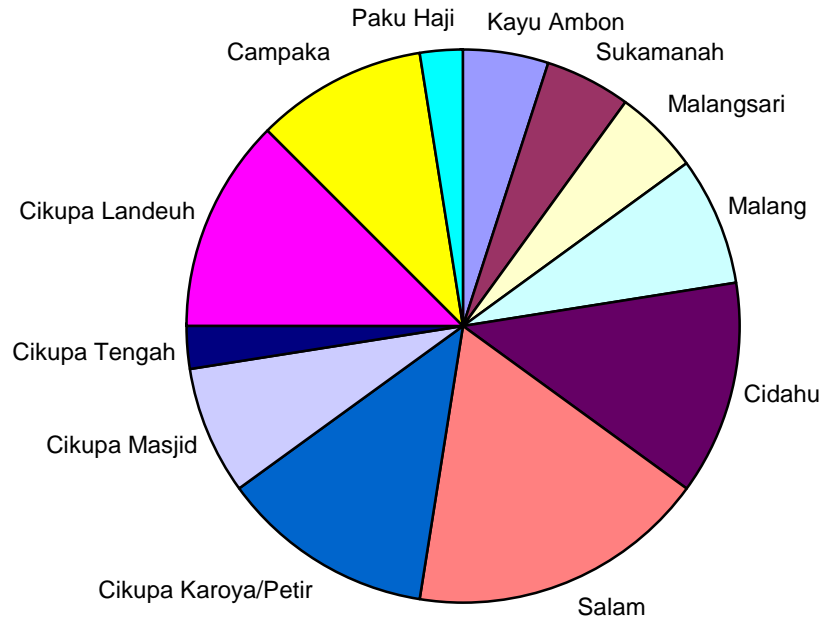


**Figure 3. Distribution of Total Households by *Kampung***
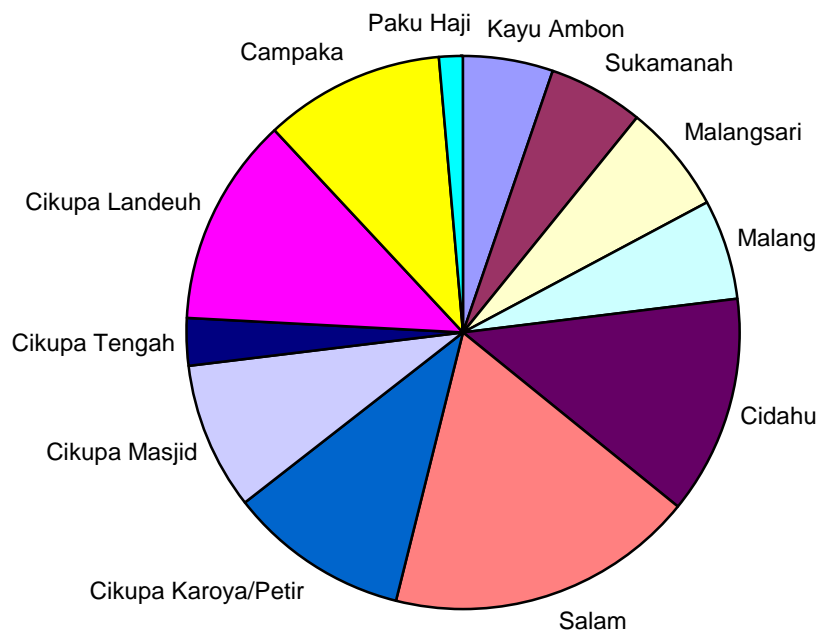
Based upon a simple categorization of total annual income amounts, Saninten is dominated by 'poor' households, while having only a limited number of 'wealthy' (Figure 4).

**Figure 4. Distribution of Sample Household by Income Category**

'WEALTHY'
(>Rp 12 million/year)
mean=Rp 30,162,500

'MIDDLE'
(Rp 5-12 million/year)
mean=Rp 7,513,643

'POOR'
(<RP 5 million/year)
mean=Rp 2,801,705
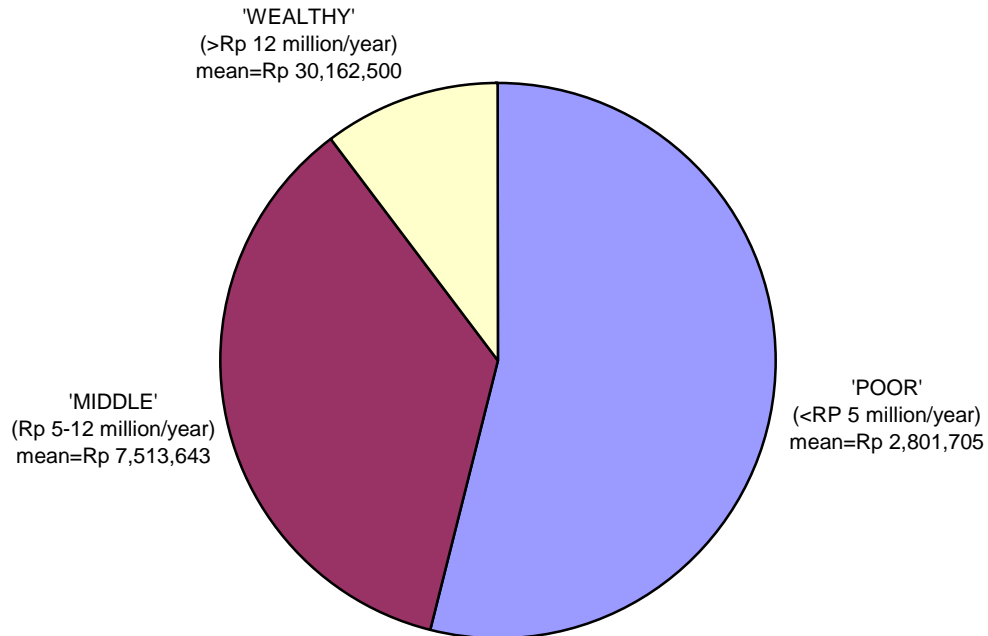
## 3.0  HOUSEHOLD ASSETS

The livelihoods model is an analytical tool for generating a better understanding of the complex factors that must be confronted by rural households in constructing secure livelihoods.  As such, it displays relationships and inter-connections between a number of different concepts, not all of which are amenable to measurement.  However, there are several key components that can be quantitatively analyzed, including various assets.  The current research examined the 'natural capital' available to Saninten households in the form of land, as well as 'human capital' in the form of labour and education.

### 3.1.  'Natural Capital' – Land

Land is a critical asset for rural households, as their livelihoods are often highly dependent on the available natural resource base.  A lack of such 'natural capital' eliminates the possibility to engage in own-account farming and to thereby earn 'farm' incomes.  Landlessness is also a primary 'push' factor for the pursuit of non-farm activities, although the lure of higher incomes and other benefits also 'pull' individuals to such livelihood opportunities.

In Saninten village, households access land through three separate tenure arrangements.  The first is private ownership of 'village land', which is most often obtained through inheritance.  The second is access to cultivation on state-owned 'Perhutani land', which was initially granted to local people in 1997 and 1998 through the government's 'Social Forestry' program.  The precise terms of access and use rights regarding this land remain uncertain, as government policy has been in transition toward a Joint Forest Management (PHBM) scheme.  The final system involves a social relationship between a landowner and another household termed here as 'sharecropping' wherein a user is granted certain limited rights to cultivate specific commodities (particularly bananas) in exchange for maintaining the land for the owner.

It is important to note that the value of a single hectare of land is highly variable for each system based upon its relative production and attendant income-earning potential.  'Village land' is generally the most valuable, as it tends to contain many large trees that produce commodities of significant market value (durian, *petai*, cloves) at a high rate per tree, intercropped with mid-intensity banana cultivation as well as coffee. This diverse cropping system represents the most advanced stage of an evolving process of long-term investment in the land and certain trees.  'Perhutani land' remains at a mid range of value because it has yet to evolve to such a stage, characterized instead by income-earning from only a limited number of commodities (bananas, coffee, *melinjo*, avocado) that mature to productive capability in a relatively short period of time compared to the other large trees.  Finally, sharecropping is the least valuable system per land unit, as the operator earns an income only from specific commodities rather than benefiting from the full potential of the given land base.

The nature of 'farm' production in Saninten as 'agro-forestry' poses a particular challenge to quantitatively analyzing the benefits of land as an asset. In conventional mono-cropping systems there is generally a consistent positive correlation between land size and farm outputs, such that all households with the same amount of land would produce roughly the same quantity of output. Of course significant differences exist based on inputs (seed, fertilizer, pesticides), available labour, machinery, soil quality and so on, but the relationship between the independent variable of land size and the dependent variable of agricultural output is strong.

In agro-forestry, on the other hand, this relationship is much weaker because total outputs depend not only on land size but also on the number and productivity of individual trees, which in turn is the result of long-term investment and maintenance. In fact, for agro-forestry the 'natural capital' of trees may be just as important as land. For example, a plot of barren 'village land' would be much less valuable than a similar sized plot of 'Perhutani land' with a large number of seedlings. Unfortunately, however, the research was not able to collect detailed information on the number and maturity of trees owned by sample households.

Overall, agro-forestry in Saninten is a highly diverse system with significant differences from household to household and from one piece of land to the next. Nevertheless, the different values of land types holds true as a general rule, and land ownership and access is a key sign of livelihood security and success.

Data from the sample survey revealed limited land access for Saninten households (Table 1). Considering all land use systems, a total of **22.5%** of Saninten households have no access whatsoever to land, while **15%** access land only through the limited arrangements of sharecropping (Figure 5). Thus, overall land access is quite constrained with the vast majority of households owning either no land at all or only minimal amounts (Table 2).

**Table 1. Land Accessed by Sample Households**

| Land Use System | % of HHs | | Land Accessed (ha.) |
|---|---|---|---|
| 'village land' | 40% | mean | 0.685[*] |
| | | total ha. | 10.28 |
| 'Perhutani land' | 35% | mean | 0.375 |
| | | total ha. | 5.25 |
| sharecropping | 25% | mean | 0.536 |
| | | total ha. | 5.36 |

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[*]A single household owning 10 hectares was not considered for this analysis as this highly unusual land ownership amount unreasonably skews the results

**Figure 5. Sample Households by Access to Land**
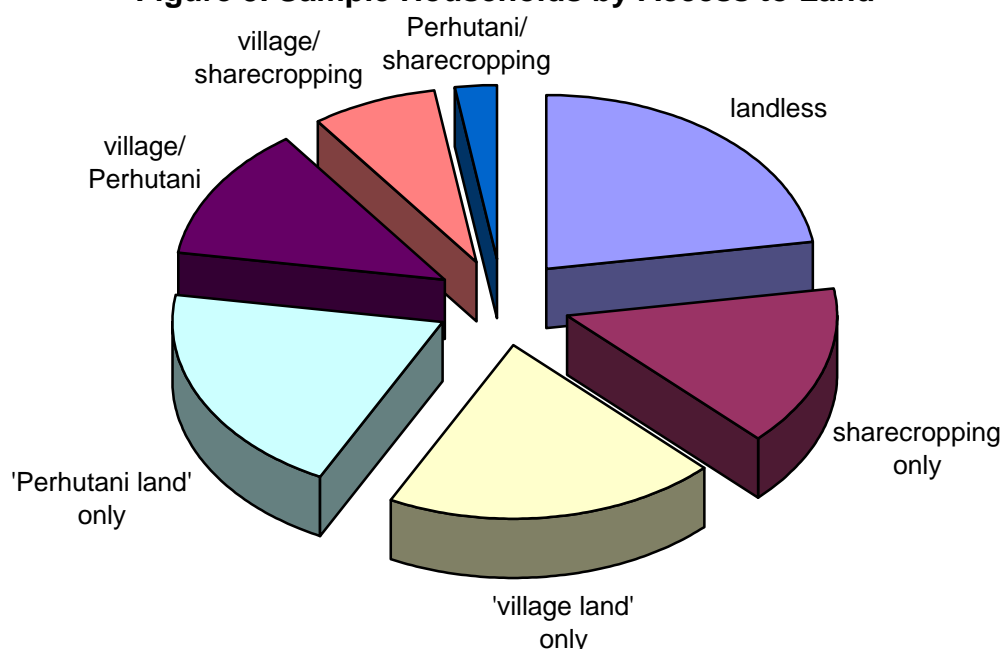


**Table 2. Size Distribution of Land Accessed by Households**

| Area Range | private land (%) | SF land (%) | sharecropping (%) | Total Land (%) |
|---|---|---|---|---|
| None | 60 | 65 | 75 | 22.5 |
| 0.25 ha. or less | 10 | 27.5 | 10 | 27.5 |
| 0.26 – 0.50 ha. | 10 | 2.5 | 10 | 15 |
| 0.51 – 1 ha. | 12.5 | 5 | 2.5 | 25 |
| More than 1 ha. | 7.5 | 0 | 2.5 | 10 |
| TOTAL | 100 | 100 | 100 | 100 |

The value of accessing land through the three systems becomes more apparent by comparing mean access levels across income terciles (Table 3) and income categories (Table 4). For 'village land' there is a consistent positive correlation between land access per household and wealth, clearly signifying the importance of this key 'natural capital' for village livelihoods. Sharecropping shows a similar positive correlation, although the four 'wealthy' households do not engage in sharecropping in addition to their already substantial private cultivation.

A critical finding of this research emerges in relation to the access of the poor to 'Perhutani land'. By income tercile, the lowest level clearly has the highest mean land access at 0.25 hectares. Averaged over 21 'poor' households, 13 of which have no access at all, the figure drops to 0.167 hectares; less than the average of wealthy households at 0.188 hectares. However, the total hectares for the groups as a whole show the significance of access for the 'poor'.

This relationship between access to 'Perhutani land' and lower income categories leads to two main points. First, it suggests that this system of cultivation is not yet very profitable, as those utilizing it have thus far remained poor. However, it also suggests that poorer households benefited the most from the granting of access to land, and that it is the livelihoods of the 'poor' that are now most at issue in securing rights of tenure and use through Joint Forest Management (PHBM) and 'good forest governance'.

**Table 3. Mean Land Accessed (ha.) by Income Tercile**

| Land Use System | I | II | III |
|---|---|---|---|
| 'village land' | 0.048 | 0.085 | 0.657 |
| 'Perhutani land' | 0.250 | 0.047 | 0.096 |
| sharecropping | 0.030 | 0.094 | 0.288 |
| All Land Types | 0.328 | 0.237 | 1.042 |

**Table 4. Mean Land Accessed (ha.) by Income Category**

| Land Use System | | 'poor' (n = 21) | 'middle' (n = 14) | 'wealthy' (n = 4) | Total |
|---|---|---|---|---|---|
| 'village land' | mean | 0.068 | 0.350 | 0.986 | 0.264 |
| | *total ha.* | *1.43* | *4.90* | *3.95* | *10.28* |
| 'Perhutani land' | mean | 0.167 | 0.071 | 0.188 | 0.135 |
| | *total ha.* | *3.50* | *1.00* | *0.75* | *5.25* |
| sharecropping | mean | 0.065 | 0.286 | 0.000 | 0.137 |
| | *total ha.* | *1.36* | *4.00* | *0.00* | *5.36* |
| All Land Types | mean | 0.300 | 0.707 | 1.174 | 0.536 |
| | *total ha.* | *6.29* | *9.90* | *4.70* | *20.89* |

## 3.2. 'Human Capital' – Labour and Education

The second key asset to be quantitatively measured by the research was 'human capital'. The variables drawn out of this broad concept were based on analyzing the quantity of labour available to a household (household size) and the quality of that labour (age and education) (Table 5). The mean household size in Saninten, including all adults and children, is **6.45** members. Of this total, approximately **3** are 'Economically Active Adults', between the ages of 15-60 years old, and not occupied by education. Generally this includes the male and female household heads and a child 15 years or older that still lives in the resident home. Saninten has very few non-residents per household, which limits remittances.

The age of male household heads range from 28 to 70 years old, with a mean of approximately 45. Female household heads tend to be slightly younger, with a range from 25 to 64 and a mean of approximately 39.

### Table 5. Mean Household Demographic and Education Data

| | Sample Households (n = 40) |
|---|---|
| Household Size (Actual – resident) | 6.45 |
| Household Size (EAAs – resident) | 2.98 |
| Household Size (AEUs – resident) | 4.57 |
| Household Non-residents | 0.55 |
| Age of Male HH Head | 45.38 |
| Age of Female HH Head | 38.62 |
| Education of Male HH Head (years) | 6.30 |
| Education of Female HH Head (years) | 6.15 |
| Education of HH – resident EAAs (years) | 18.83 |
| Education of HH – per capita resident EAAs (years) | 6.34 |

Note: See 1.4 above for explanation of definitions.

Education levels are measured by the total number of years in schooling, based on proxies of 6 years for *Sekolah Dasar* (elementary school) and 3 years for *Sekolah Menengah Pertama* (middle school). Overall, the survey revealed very limited variation in educational achievements for both EAAs and children. By far the most common scenario for each individual is to complete SD education to Class 6 but nothing beyond this point, as evident from the means of the education categories that all hover around a 6 year average. The primary obstacle is the additional expense required to pursue SMP, which thus limits such education only to wealthier households. On the one hand, the results should be considered as a positive sign that all individuals receive basic education. On the other hand, the vast majority are restricted from pursuing education beyond the 6-year basic level. Educational achievement at the SMP level is only slightly skewed toward males (Table 6).

### Table 6. Education Level Reached by Gender

| Education Level Reached | Male | | Female | | All | |
|---|---|---|---|---|---|---|
| | *count* | *%* | *count* | *%* | *count* | *%* |
| SD | 56 | 87.5 | 49 | 89 | 105 | 88 |
| SMP | 8 | 12.5 | 6 | 11 | 14 | 12 |
| TOTAL | 64 | 100 | 55 | 100 | 119 | 100 |

Note: All resident EAAs.

It is important to consider whether or not these factors of 'human capital' show any significant relationships with relative wealth and activity options in order to understand the role of this asset in constructing livelihoods. By income tercile, poorer households have the smallest resident household size and the largest number of EAAs (Table 7). Yet these differences are minimal and are not likely a causal factor for determining overall wealth. The same is true for age of the male household head, which is likewise fairly similar across the levels.

Education levels, on the other hand, do appear to be positively correlated with wealth, as the number of years spent in education by resident EAAs per capita consistently rises through the levels (Tables 7 and 8).  This simply highlights the fact that the number of individuals to have completed SMP increases in each successive wealth group.  The problem with this finding is an issue of circular reasoning that is difficult to untangle. The educational levels completed by individuals in the past may have provided them with better livelihood opportunities from which they generated their current wealth.  Alternatively, individuals may have been able to access higher education based on previous wealth.  The basic question is whether education is a means of gaining future wealth, or simply a symbol of current wealth.  The answer requires greater specificity of examining particular livelihood activities.

**Table 7. Mean 'Human Capital' by Income Tercile**

|  | I | II | III |
|---|---|---|---|
| Household Size (Actual – resident) | 6.00 | 6.85 | 6.54 |
| Household Size (EAAs – resident) | 3.15 | 2.85 | 2.92 |
| Age of Male Household Head | 43.62 | 46.38 | 44.85 |
| Education of HH – per capita resident EAAs (years) | 6.06 | 6.12 | 6.87 |

**Table 8. Mean 'Human Capital' by Income Category**

|  | 'poor' (n = 21) | 'middle' (n = 14) | 'wealthy' (n = 4) |
|---|---|---|---|
| Household Size (Actual – resident) | 6.24 | 6.21 | 8.50 |
| Household Size (EAAs – resident) | 3.00 | 2.79 | 3.50 |
| Age of Male Household Head | 44.76 | 46.43 | 40.75 |
| Education of HH – per capita resident EAAs (years) | 6.11 | 6.43 | 7.34 |

## 4.0  SUBSISTENCE

Access to land is not only a key asset for wealth and income, but also for the 'food security' needs of the household.  For each of the seven separate food crops grown by Saninten agro-forestry farmers, certain amounts are kept for the purpose of home consumption (Table 9).  Banana cultivation is the most significant source of food, as it provides the largest amount at a more or less consistent rate over the course of a year, while the other commodities provide more limited supplementary food inputs during their specific harvest periods. The evidence regarding 'Perhutani land' should be seen as another important success of the program to grant access to state-owned forest land, as it has not only provided a source of income to local households but also a significant source of food.  Finally, the substantial amount of food generated from sharecropping is not surprising, as it is for this very purpose that most households undertake the activity.

**Table 9. Mean Home Consumption by Commodity and Land Use System**

| Food Crop | Source | | |
|---|---|---|---|
| | 'village land' | 'Perhutani land' | sharecropping |
| bananas (bunches/year) | 74.57 | 70.29 | 66.86 |
| coconut (fruits/year) | 150 | - | 180 |
| coffee (kilos/year) | 7.00 | 5.80 | 7.50 |
| durian (fruits/year) | 37.67 | - | 10.00 |
| *melinjo* (kilos/year) | 7.62 | 5.00 | 7.50 |
| *petai* (bunches/year) | 1.42 | - | - |
| avocado (kilos/year) | - | 8.33 | - |

Note: Figures are the mean consumption amounts for households cultivating the particular crop.

## 5.0  LIVELIHOOD ACTIVITIES AND INCOMES

Livelihood activities are the work or jobs that individuals engage in to generate a benefit for themselves and their families.  They are the practical things people do on a daily basis – cultivating a crop, raising livestock, fishing, gathering resources from the forest, labouring for a wage, sharecropping, operating a small business, working at a government office, trading, and so on. The outcome or result of each activity is an 'income' – cash, goods, or a service. Conventionally this is quantitatively measured as a cash figure earned in one year, including a proxy calculation of outputs produced but directly consumed.

The categorization of livelihood activities can take on many forms from broad to specific definitions. Typically, as is done here, a distinction is made between 'farm' or natural resource based activities and 'non-farm' or non-natural resource based activities.  The former are most often at the core of rural communities and have been the central focus of study for many years.  The latter are increasingly prevalent, revealing the diverse nature of rural livelihoods.

### 5.1.  Agro-Forestry

Saninten is a forest-based community situated upon a relatively steep mountain slope with limited access to water. Such natural features largely define cultivation practices, which can be considered as 'agro-forestry'.  This livelihood activity has the highest participation rate in Saninten with **77%** of households involved in agro-forestry cultivation through at least one of three land use systems.  At the same time it accounts for only **40.8%** of total village income, with 'village land' generating by far the greatest amount (84% of total agro-forestry) among the land use systems (Figure 6).

**Figure 6. Total Village Income Generation by Livelihood Activity**
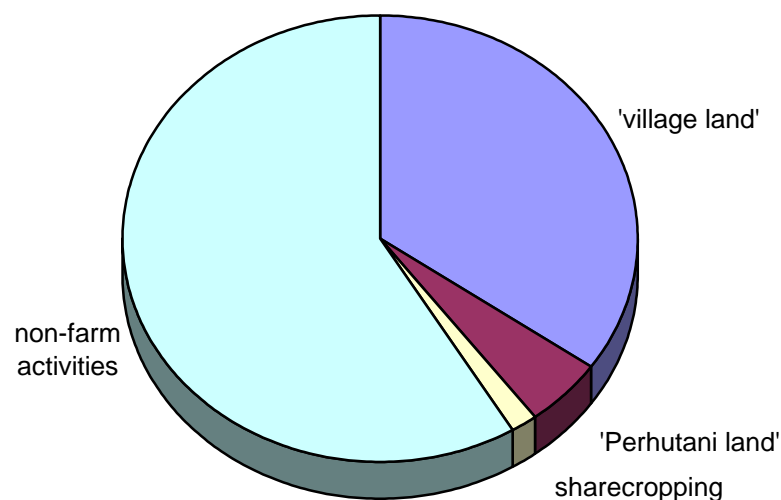
Mirroring the distribution of land resources discussed above, share of agro-forestry incomes increases with wealth for 'village land', but decreases for 'Perhutani land' (Tables 10 and 11). By both income tercile and income category, those with the highest annual incomes depend most heavily upon agro-forestry activities. The 'poor' category of households derives the smallest percentage of their total incomes from agro-forestry, relying instead upon non-farm sources. However, those with the least annual incomes depend the most upon 'Perhutani land' relative to other land use systems.

**Table 10. Share of Agro-forestry in Total Income by Income Tercile**

| Land Use System | Share | | |
|---|---|---|---|
| | I | II | III |
| 'village land' | 7% | 15% | 44% |
| 'Perhutani land' | 22% | 5% | 2% |
| sharecropping | 2% | 4% | 1% |
| All Land Types | 31% | 24% | 47% |

Note:   Total agro-forestry income as a proportion of total household income; data summed across all sample households.

**Table 11. Share of Agro-forestry in Total Income by Income Category**

| Land Use System | Share | | |
|---|---|---|---|
| | 'poor' (n = 21) | 'middle' (n = 14) | 'wealthy' (n = 4) |
| 'village land' | 13.4% | 29.8% | 48.3% |
| 'Perhutani land' | 11.2% | 4.7% | 1.7% |
| sharecropping | 5% | 2% | 0% |
| All Land Types | 29.6% | 36.5% | 50% |

Note:   Total agro-forestry income as a proportion of total household income; data summed across all sample households.

As discussed above, the cropping patterns for each land use system are highly differentiated. 'Village land' generates income from a wide diversity of commodities, as this land type tends to contain many large, mature trees in combination with the perennial tropical crops, banana and coffee (Figure 7). 'Perhutani land', which was entirely barren only 7 to 8 years ago, thus far earns income from only four commodities that mature from seedlings to production in relatively short time periods (banana in 1 year; coffee in 2 years; *melinjo* in 7 years; avocado in 5 years) (Figure 8). Finally, sharecropping produces farm incomes primarily from banana cultivation, although it also involves a number of additional commodities including a single respondent earning an income from sharecropping paddy land (Figure 9).

**Figure 7. Agro-forestry Annual Income by Commodity – 'Village Land'**
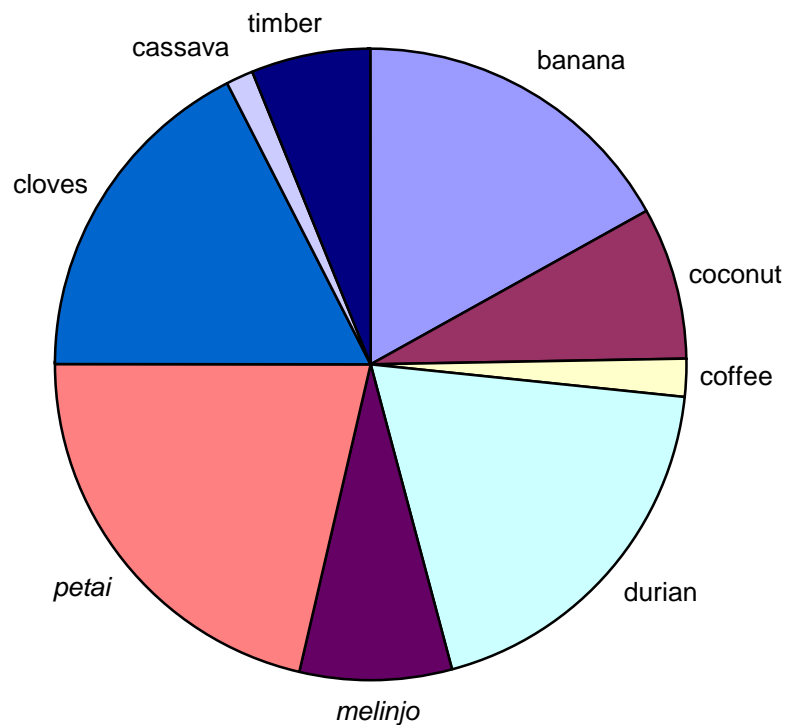


Note: Data summed across 15 households cultivating 'village land'.

**Figure 8. Agro-forestry Annual Income by Commodity – 'Perhutani Land'**
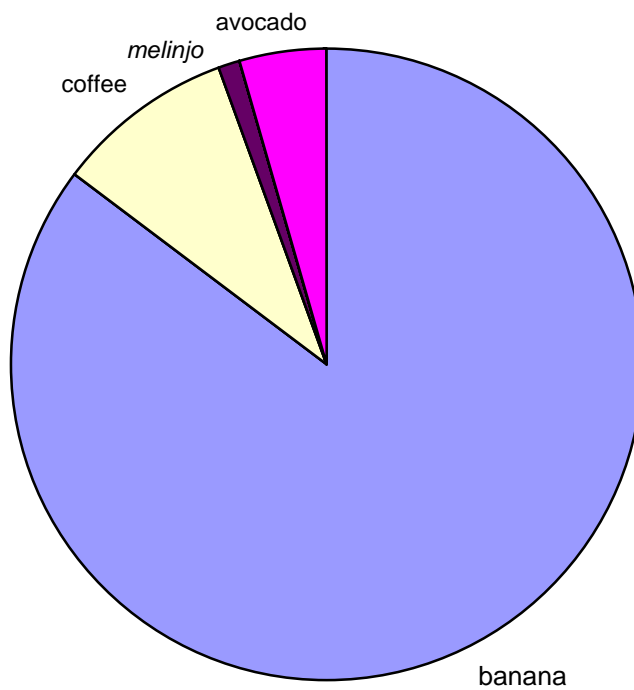


Note: Data summed across 14 households cultivating 'Perhutani land'.

**Figure 9. Agro-forestry Annual Income by Commodity – Sharecropping**



rice
cassava
*petai*
*melinjo*
durian
coffee
coconut
banana
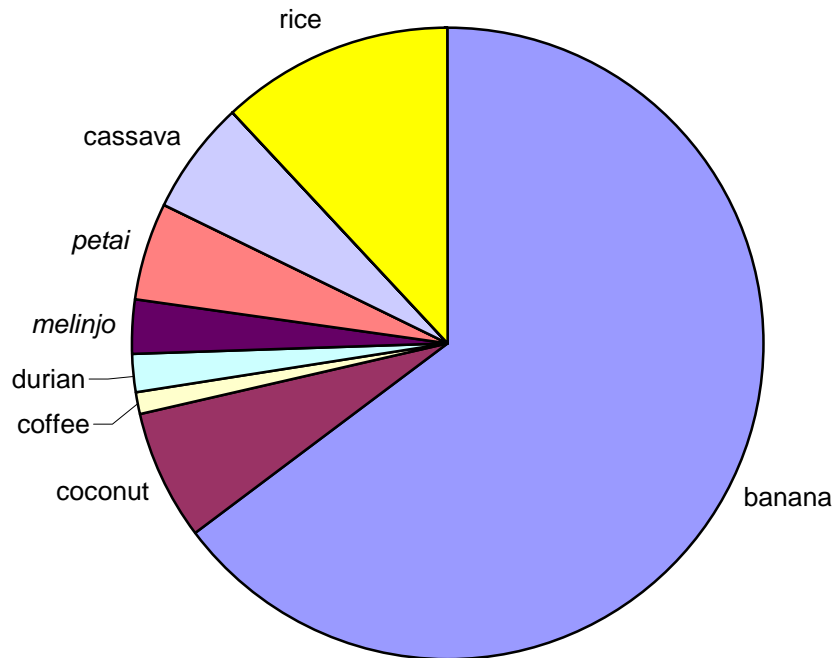
Note: Data summed across 10 households engaged in sharecropping.

The mean annual incomes earned by a single household reveal the much higher productivity and profitability of 'village land' based upon its diversity of commodities (Table 12).  For example, income per household for particular commodities such as banana and coffee are relatively similar for 'village land' and 'Perhutani land'.  However, 'village land' simply incorporates a greater number of commodities, including the highly profitable cultivation of durian, *petai*, and cloves.  This suggests that the value of 'Perhutani land', measured by the total income it can generate, is likely to substantially increase once the seedlings of such trees mature. However, production levels on 'Perhutani land' will always be at a disadvantage when compared to 'village land' as the former contains a high density of mahogany trees, which are not of benefit to the farmer. Nevertheless, judging by the average number of trees on one hectare of 'Perhutani land' that have yet to reach their production stage (Table 13), the profitability of this system is yet likely to significantly increase.

Judging on a per-hectare rather than a per-household basis, the differences in profitability and cropping patterns between the land use systems is again clear (Table 14).  'Perhutani land' produces greater amounts of banana and coffee per hectare than 'village land', but it entirely lacks any income generation from a number of major sources.  Sharecropping is again revealed as a system characterized primarily by the intercropping cultivation of bananas, although a handful of additional commodities are also involved.

**Table 12. Agro-forestry Income Per Household by Commodity and Land Use System**

| Commodity | | Land Use System | | |
| --- | --- | --- | --- | --- |
| | | 'village land' | 'Perhutani land' | sharecropping |
| banana | mean income/household | 1,100,800 | 829,714 | 466,286 |
| | *total households* | *15* | *14* | *7* |
| coconut | mean income/household | 698,182 | - | 115,333 |
| | *total households* | *11* | *-* | *3* |
| coffee | mean income/household | 197,778 | 123,200 | 27,000 |
| | *total households* | *9* | *10* | *2* |
| durian | mean income/household | 1,322,857 | - | 29,333 |
| | *total households* | *14* | *-* | *3* |
| *melinjo* | mean income/household | 587,692 | 53,333 | 46,667 |
| | *total households* | *13* | *3* | *3* |
| *petai* | mean income/household | 1,729,167 | - | 85,000 |
| | *total households* | *12* | *-* | *3* |
| cloves | mean income/household | 1,430,000 | - | - |
| | *total households* | *12* | *-* | *-* |
| cassava | mean income/household | 250,000 | - | 300,000 |
| | *total households* | *5* | *-* | *1* |
| timber | mean income/household | 865,714 | - | - |
| | *total households* | *7* | *-* | *-* |
| avocado | mean income/household | - | 66,667 | - |
| | *total households* | *-* | *9* | *-* |
| rice | mean income/household | - | - | 600,000 |
| | *total households* | *-* | *-* | *1* |
| **Total** | mean income/household | **6,501,133** | **972,000** | **504,700** |
| | *total households* | *15* | *14* | *10* |

**Table 13. Number of Trees Per Hectare on 'Perhutani Land' by Commodity**

| Commodity | Number of immature seedlings on 'Perhutani land' |
| --- | --- |
| coffee | 117 |
| durian | 45 |
| *melinjo* | 61 |
| *petai* | 45 |
| cloves | 57 |
| avocado | 40 |
| mahogany | 86 |

**Table 14. Agro-forestry Income Per Hectare by Commodity and Land Use System**

| Commodity | | Land Use System | | |
|---|---|---|---|---|
| | | 'village land' | 'Perhutani land' | sharecropping |
| banana | mean income/ha. | 1,607,007 | 2,212,571 | 1,063,784 |
| | *total ha.* | *10.275* | *5.25* | *3.04* |
| coconut | mean income/ha. | 913,199 | - | 223,226 |
| | *total ha.* | *8.41* | *-* | *1.55* |
| coffee | mean income/ha. | 232,528 | 352,000 | 51,429 |
| | *total ha.* | *7.66* | *3.50* | *1.05* |
| durian | mean income/ha. | 1,963,945 | - | 42,927 |
| | *total ha.* | *9.43* | *-* | *2.05* |
| *melinjo* | mean income/ha. | 793,354 | 160,000 | 93,333 |
| | *total ha.* | *9.63* | *1.00* | *1.50* |
| *petai* | mean income/ha. | 2,272,727 | - | 231,818 |
| | *total ha.* | *9.13* | *-* | *1.10* |
| cloves | mean income/ha. | 1,823,592 | - | - |
| | *total ha.* | *9.41* | *-* | *-* |
| cassava | mean income/ha. | 271,739 | - | 2,000,000 |
| | *total ha.* | *4.60* | *-* | *0.15* |
| timber | mean income/ha. | 1,066,901 | - | - |
| | *total ha.* | *5.68* | *-* | *-* |
| avocado | mean income/ha. | - | 200,000 | - |
| | *total ha.* | *-* | *3.00* | *-* |
| rice | mean income/ha. | - | - | 30,000,000 |
| | *total ha.* | *-* | *-* | *0.02* |
| **Total** | mean income/ha. | **9,486,089** | **2,592,000** | **1,307,513** |
| | *total ha.* | *10.28* | *5.25* | *3.86* |

### 5.2. Other Natural Resource-Based Activities

Two activities emerged from the survey which did not fit the definition of agro-forestry but were nevertheless dependent upon the natural resource base.  Thus, these income sources were classified as distinct categories.  The first is horticulture, which involves the cultivation of numerous specialty crops such as eggplant and *bok choy* on a small plot of 0.35 hectares. Local income from this activity is derived from wages received in exchange for managing production. The landowner himself, who is an external resident, earns an income from marketing the outputs through personal connections to buyers in major centres. The total annual income of **Rp 2,400,000** (Rp 200,000/month) reported by a single survey respondent is relatively quite high compared to many other activities.

The second natural resource-based activity involves the small-scale mining of stone from 'village land'.  The stone is extracted by hand and collected at a common point adjacent to a primary road.  The stone is then sold to an external buyer who arranges its pick-up and delivery using a large truck.  Those engaged in this activity suggested that it did not have a significant negative impact on the land, as either the land was of poor quality to begin with due to the stone or because the soil could be regenerated after the stone was removed.  They also stated that the activity was very physically demanding.  Based on the reports of a single survey respondent who conducts this activity, stone mining is much less profitable on a per-hectare basis than typical agro-forestry on 'village land'.  For example, the respondent generated an agro-forestry income of Rp 5,644,000 from 0.75 hectares of 'village land', while earning only **Rp 2,000,000** from extracting stone on an additional equal amount of land.  However, this may be an unfair comparison if the land is truly not viable for agro-forestry production, and thus extracting stone is the better livelihood activity option.

Together these two livelihood activities account for approximately **1.55%** of total village income generation.  Based upon supporting qualitative information, the role of horticultural incomes is likely even less important to the village as a whole, as only a few individuals earn an income from this source.  Its inclusion in the random sample was therefore very much by chance.  Stone mining, on the other hand, may be slightly more important than the sample suggests, as it is a relatively prevalent village activity.

## 5.3. Non-farm Activities

Non-farm livelihood activities are highly prevalent in Saninten village with **77%** of households engaged to some extent in an activity outside of core agro-forestry. Contrary to conventional assumptions concerning the nature of rural livelihoods, non-farm sources generate the greatest proportion of village income with **58%** of the total (see Figure 6 above).  For a detailed explanation of each of the 12 non-farm activity categories identified in Saninten village, reference should be made to the preceding 'Village Report' produced by this research project.

At the level of the entire village, the greatest non-farm contributors to total income generation include migration, large-scale trading, and local industry (Figure 10). However, the distribution of that income across households is highly unequal, as only **22%** of households engage in these top three activities to earn **54%** of the total non-farm income (Figure 11).  This issue becomes clearer by separating households into income categories, which reveals a negative correlation between wealth and the share of non-farm income within total income, and a positive correlation between wealth and mean non-farm income (Table 15). This indicates that the 'poor' depend the most upon non-farm activities to generate their total household income, but that these activities yield only marginal returns.  On the other end of the spectrum, non-farm sources make up half the annual incomes of 'wealthy' households and they yield massively more substantial earnings.

### Figure 10. Village Non-farm Income Generation by Non-farm Activity



22
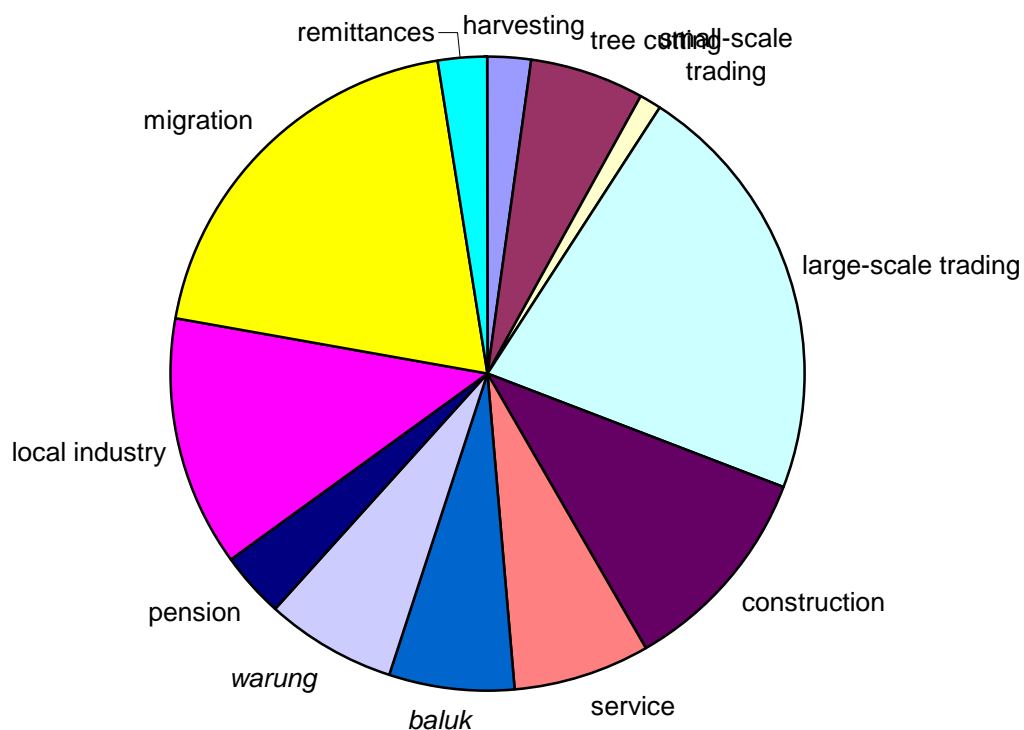
## Figure 11. Non-farm Activities – % of Income and % of Households
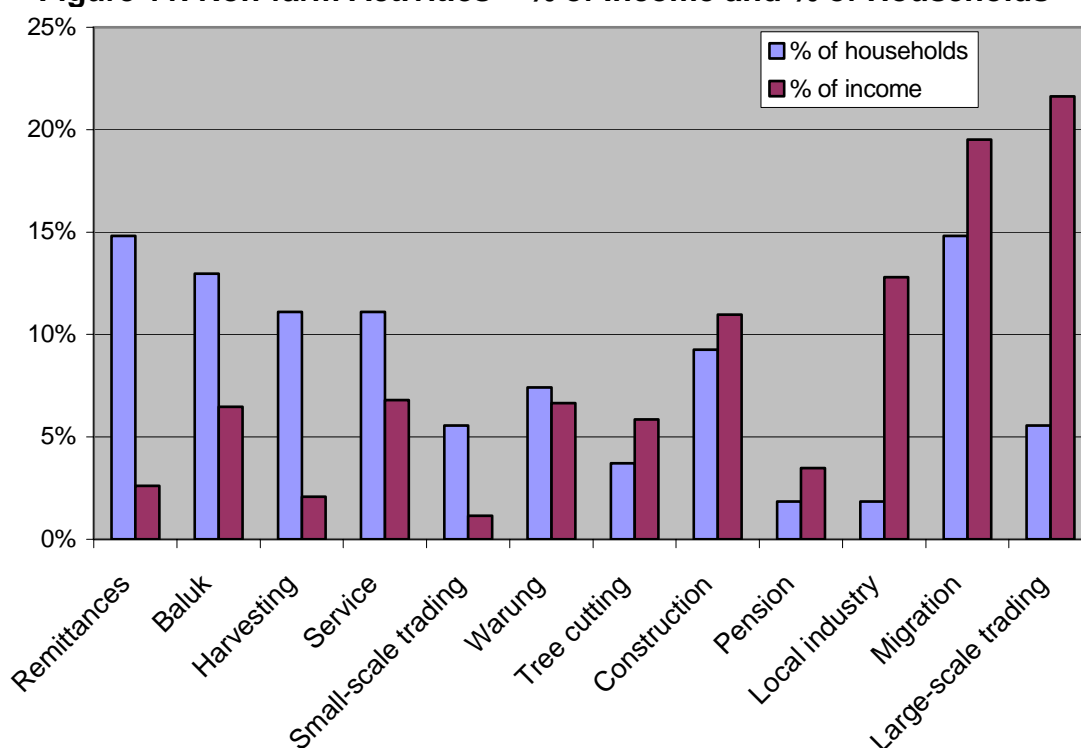


## Table 15. Share of Non-farm in Total Income by Income Category

| Income | Share | | |
|---|---|---|---|
| | 'poor' (n = 21) | 'middle' (n = 14) | 'wealthy' (n = 4) |
| % non-farm in total | 70% | 59% | 50% |
| mean non-farm (Rp) | 1,970,943 | 4,461,071 | 15,065,000 |

The basic problem that this data highlights concerns the significant obstacles faced by the 'poor' in accessing more highly remunerated non-farm options. This is a fundamental crux of the challenge of poverty alleviation in relation to livelihood diversification and the adoption of non-farm activities. Simply put, the poor stay poor because they are limited in their choice of activities to lower-paid options while the rich get richer based on their ability to transform current wealth into increasing future gains. In Saninten, the 'poor' income category are confined to activities which they can access using their labour assets and minimal financial investments (Figure 12), but which produce low annual incomes (Table 16).

While they do not harvest or trade agricultural products, and several of them operate small shops (*warung*), the 'middle' group conducts many of the same non-farm activities as the 'poor' (Figure 13). However, there are large differences in remuneration for these similar activities based upon the nature of the specific job (Table 16). For example, the 'poor' earn minimal wages from

**Figure 12. Non-farm Incomes of 'Poor' Households by Non-farm Activity**
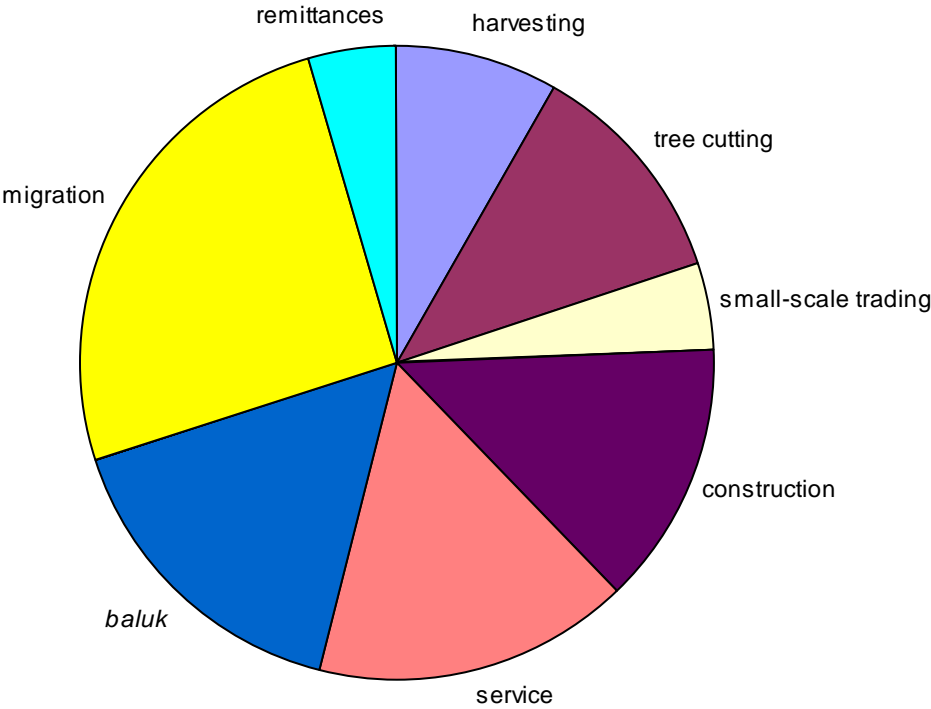


**Figure 13. Non-farm Incomes of 'Middle' Households by Non-farm Activity**
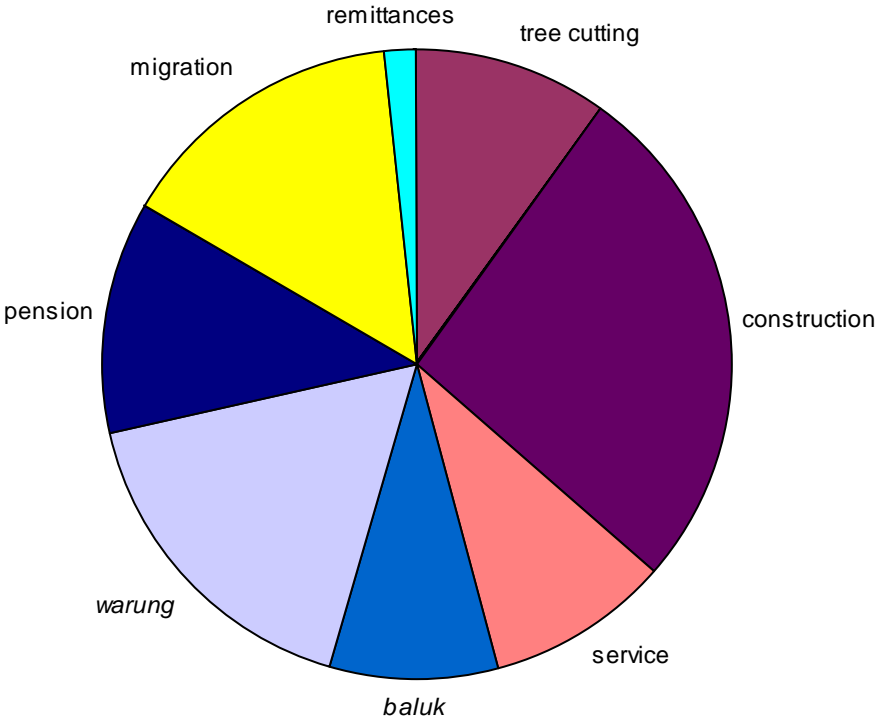
'construction' as they are limited to general labour tasks, while the 'middle' earn much higher average incomes based upon their greater technical skills. Similarly, the 'middle' tend to earn much higher mean incomes per household from migration as they are able to access such highly paid jobs as acting as a security guard, working in a factory, or operating a shop in an urban location, while the 'poor' are restricted to marginal activities such as informal petty trading and general labouring.

The non-farm activities of 'wealthy' households are dominated by 'large-scale trading' and 'local industry' (Figure 14), each of which are highly remunerated per household (Table 16).

**Figure 14. Non-farm Incomes of 'Wealthy' Households by Non-farm Activity**
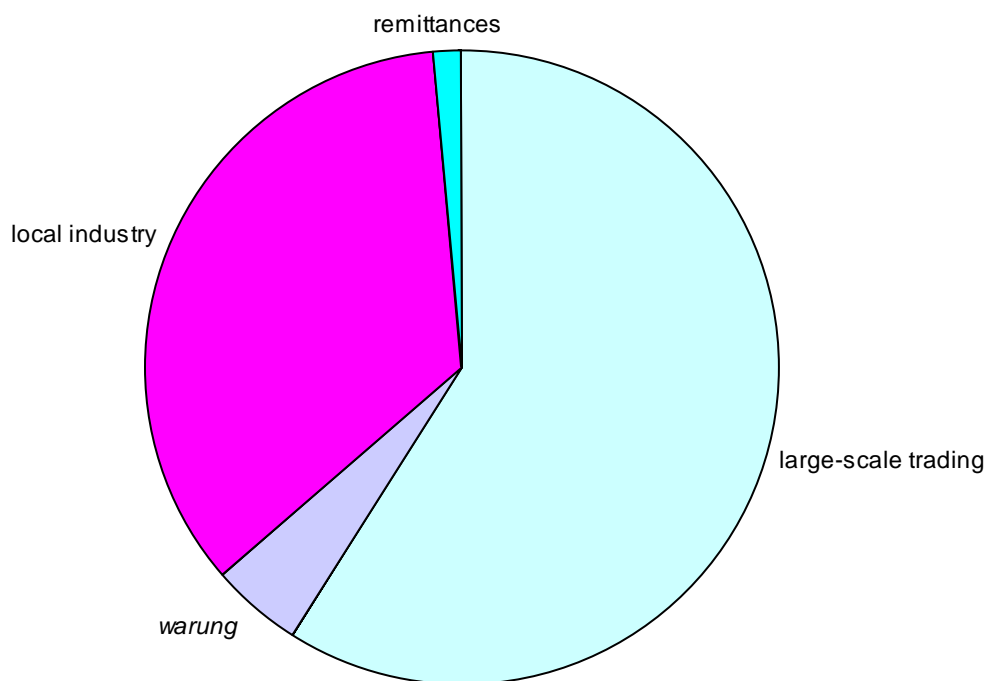


In terms of the livelihood diversity for each income category, the 'poor' tend to incorporate a number of non-farm activities within their portfolios, while the 'wealthy' more often rely on a single non-farm source (Table 17).

**Table 16. Non-farm Income Per Household by Non-farm Activity**

| Non-farm activity | | Income Category | | |
|---|---|---|---|---|
| | | 'poor' | 'middle' | 'wealthy' |
| harvesting | mean income/household | 570,333 | - | - |
| | *total households* | 6 | - | - |
| tree cutting | mean income/household | 4,800,000 | 4,800,000 | - |
| | *total households* | 1 | 1 | - |
| small-scale trading | mean income/household | 626,667 | - | - |
| | *total households* | 3 | - | - |
| large-scale trading | mean income/household | - | - | 11,833,333 |
| | *total households* | - | - | 3 |
| construction | mean income/household | 1,831,000 | 6,250,000 | - |
| | *total households* | 3 | 2 | - |
| service | mean income/household | 1,681,200 | 2,220,000 | - |
| | *total households* | 4 | 2 | - |
| *baluk* | mean income/household | 1,320,000 | 2,000,000 | - |
| | *total households* | 5 | 2 | - |
| *warung* | mean income/household | - | 2,680,000 | 2,880,000 |
| | *total households* | - | 3 | 1 |
| pension | mean income/household | - | 5,700,000 | - |
| | *total households* | - | 1 | - |
| local industry | mean income/household | - | - | 21,000,000 |
| | *total households* | - | - | 1 |
| migration | mean income/household | 2,116,000 | 7,150,000 | - |
| | *total households* | 5 | 3 | - |
| remittances | mean income/household | 378,000 | 762,500 | - |
| | *total households* | 5 | 2 | - |
| **Total** | mean income/household | **2,434,694** | **6,939,444** | **15,065,000** |
| | *total households* | 17 | 9 | 4 |

**Table 17. Household Participation in N-F Activities by Income Category**

| Total no. of activities* | Income Category | | |
|---|---|---|---|
| | 'poor' (n = 21) | 'middle' (n = 14) | 'wealthy' (n = 4) |
| 0 | 19% | 36% | 0% |
| 1 | 24% | 21% | 75% |
| 2 | 43% | 36% | 0% |
| 3 | 14% | 7% | 25% |
| **Total** | 100% | 100% | 100% |
| *mean/household* | *1.88* | *1.78* | *1.50* |

*On basis of 1 for each of 12 non-farm activities.

## 5.4. Income Portfolios and Mean Incomes

Utilizing a random sample survey the current research has identified the relative importance of the livelihood activities of Saninten in terms of their contribution to total village income generation.  At the broadest level of categorization, a collection of 12 non-farm activities account for the largest proportion (57%) of village income (Figure 15).  At the second level, the general non-farm and agro-forestry categories are themselves dominated by incomes from local non-farm sources and the cultivation of 'village land' respectively (Figure 16).  Finally, at the most detailed level migration, local industry, and large-scale trading are primary non-farm income generators, while major crops such as banana, durian, *petai*, and cloves are the main earners in agro-forestry (Figure 17).

**Figure 15. Income Portfolio – Saninten Village (Level 1)**
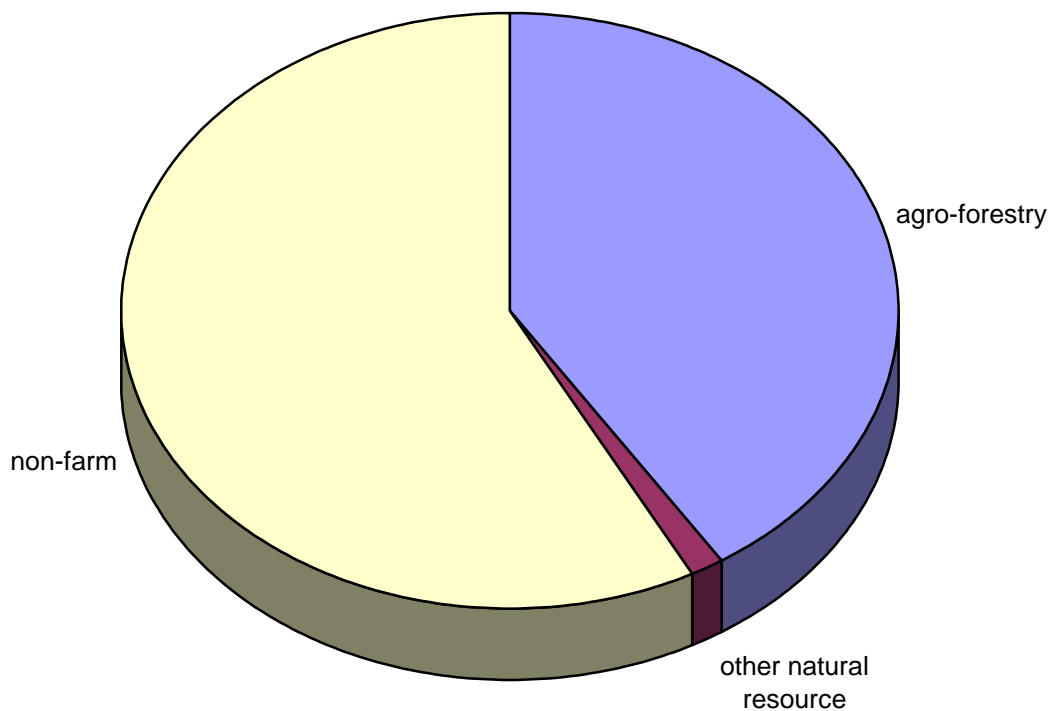


The problem with presenting data in this manner is that the relative importance of activities is based upon total income generation, and not upon their distribution among households.  Thus, while certain activities account for large shares of total village income generation, only a small number of households are engaged in them.  For example, the dominant activities of agro-forestry on 'village land', large-scale trading, local industry, and migration account for 34%, 12.5%, 7.5%, and 11% of total village income generation respectively; however, they involve only 40%, 8%, 3%, and 21% of households (Table 18).  Yet even these figures are at the general level of the village and in order to move to a more detailed understanding of village livelihoods and their relationship to poverty it is necessary to disaggregate households by wealth categories.

**Figure 16. Income Portfolio – Saninten Village (Level 2)**



- external non-farm
- agro-forestry on 'village land'
- agro-forestry on 'Perhutani land'
- agro-forestry - sharecropping
- other natural resource
- local non-farm
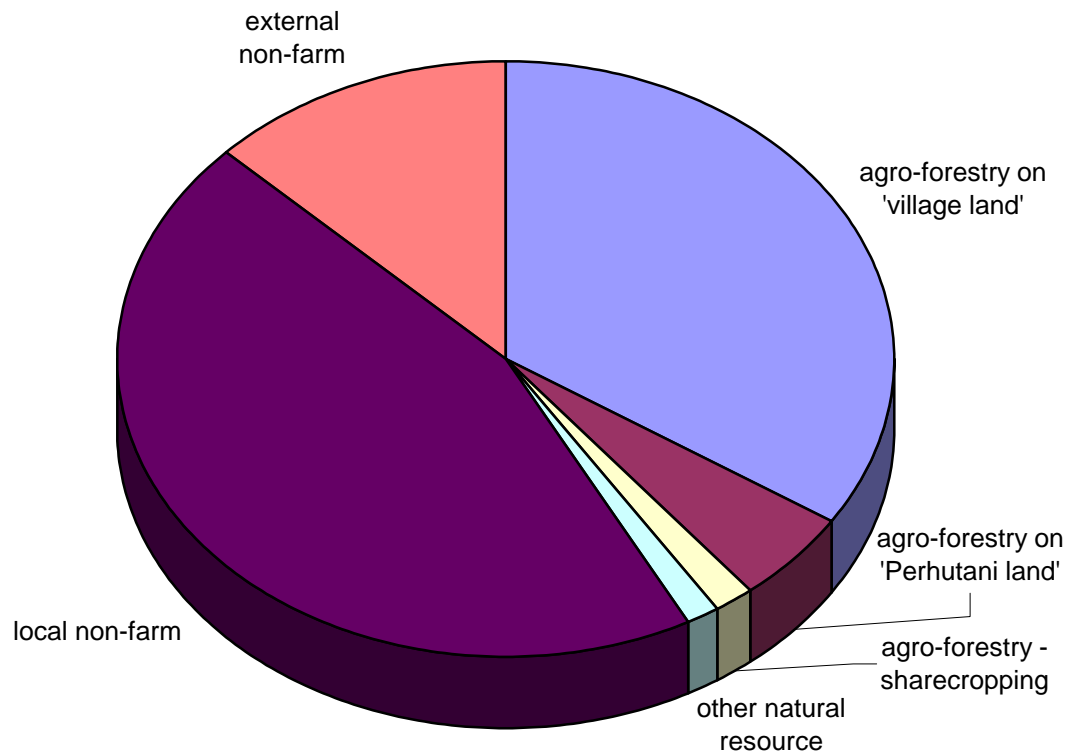
**Figure 17. Income Portfolio – Saninten Village (Level 3)**



- remittances
- VL - banana
- VL - coconut
- VL - coffee
- VL - durian
- VL - *melinjo*
- VL - *petai*
- VL - cloves
- migration
- local industry
- pension
- *warung*
- *baluk*
- service
- construction
- tree cutting
- harvesting
- small-scale trading
- large-scale trading
- horticulture
- stone mining
- VL - cassava
- VL - timber
- PL - banana
- PL - coffee
- PL - *melinjo*
- PL - avocado
- sharecropping
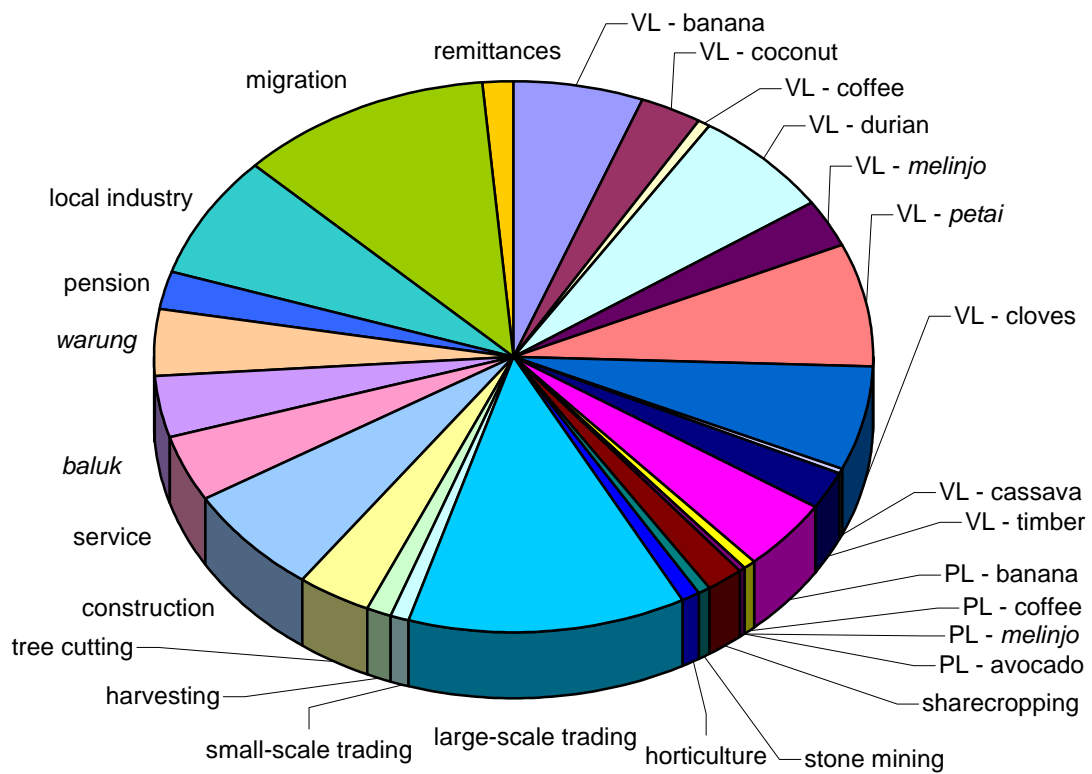
**Table 18. Livelihood Activities by Percent of Village Income, Household Participation, and Mean Income**

| Livelihood Activity | % of total village income | % of households | mean income/ household (Rp) |
|---|---|---|---|
| VL – banana | 5.80 | 38 | 1,100,800 |
| VL – coconut | 2.70 | 28 | 698,182 |
| VL – coffee | 0.63 | 23 | 197,778 |
| VL – durian | 6.50 | 36 | 1,322,857 |
| VL – *melinjo* | 2.70 | 33 | 587,692 |
| VL – *petai* | 7.30 | 31 | 1,729,167 |
| VL – cloves | 6.00 | 31 | 1,430,000 |
| VL – cassava | 0.45 | 13 | 250,000 |
| VL – timber | 2.17 | 18 | 865,714 |
| *'village land' – TOTAL* | *34.25* | *40* | *6,501,133* |
| PL – banana | 4.10 | 36 | 829,714 |
| PL – coffee | 0.44 | 26 | 123,200 |
| PL – *melinjo* | 0.06 | 8 | 53,333 |
| PL – avocado | 0.20 | 23 | 66,667 |
| *'Perhutani land'– TOTAL* | *4.80* | *36* | *972,000* |
| *sharecropping* | *1.75* | *26* | *504,700* |
| **agro-forestry – TOTAL** | **40.80** | **77** | **3,872,400** |
| stone mining | 0.70 | 2.5 | 2,000,000 |
| horticulture | 0.85 | 2.5 | 2,400,000 |
| **other NR – TOTAL** | **1.55** | **5** | **2,200,000** |
| harvesting | 1.20 | 15 | 570,333 |
| tree cutting | 3.37 | 5 | 4,800,000 |
| small-scale trading | 0.66 | 8 | 626,667 |
| large-scale trading | 12.47 | 8 | 11,833,333 |
| construction | 6.32 | 13 | 3,598,600 |
| service | 3.92 | 15 | 1,860,800 |
| *baluk* | 3.72 | 18 | 1,514,286 |
| *warung* | 3.84 | 10 | 2,730,000 |
| pension | 2.00 | 3 | 5,700,000 |
| local industry | 7.40 | 3 | 21,000,000 |
| *local non-farm – TOTAL* | *44.90* | *69* | *4,732,585* |
| migration | 11.25 | 21 | 4,003,750 |
| remittances | 1.50 | 21 | 536,875 |
| *external non-farm–TOTAL* | *12.75* | *38* | *2,421,667* |
| **non-farm – TOTAL** | **57.65** | **77** | **5,470,160** |
| TOTAL | 100.00 | 100 | 7,299,405 |

The first disaggregate is by income terciles, each containing 13 households separated on the basis of their relative ranking of total household income. The poorest group (income tercile I) depend upon non-farm sources for 76% of their total incomes (Figure 18). Among the three terciles this group has the highest percentage of income from 'Perhutani land' within their total income generation. The second tercile shares a roughly similar distribution of income sources with the exception of a significant share from tree cutting (Figure 19). The wealthiest group earns the bulk of their income from cultivating 'village land', while the highly remunerated non-farm activities of large-scale trading, local industry and migration also account for considerable proportions (Figure 20).

The poorest third of households are characterized by earning minimal incomes for each activity per household (Table 19). Only 15% cultivate 'village land' for marginal annual incomes, and even though they depend the most on 'Perhutani land' for their total household incomes they earn much smaller amounts per household conducting this agro-forestry activity than the wealthier categories. The non-farm activities on which they greatly depend likewise earn very low returns per household. Overall, households within this lowest group earn an average annual income of only **Rp 1,596,523**. The relative well-being of the middle tercile group, on the other hand, results from mean agro-forestry incomes roughly three times greater than those of the poorer group and consistently higher mean non-farm incomes. Together such higher remuneration produces average annual incomes of **Rp 4,746,538**. Finally, the wealthiest tercile earn much larger mean incomes from 'village land' and incorporate several highly-paid non-farm activities to generate substantial annual incomes of **Rp 15, 064,692**.

**Figure 18. Income Portfolio – Tercile I**



30
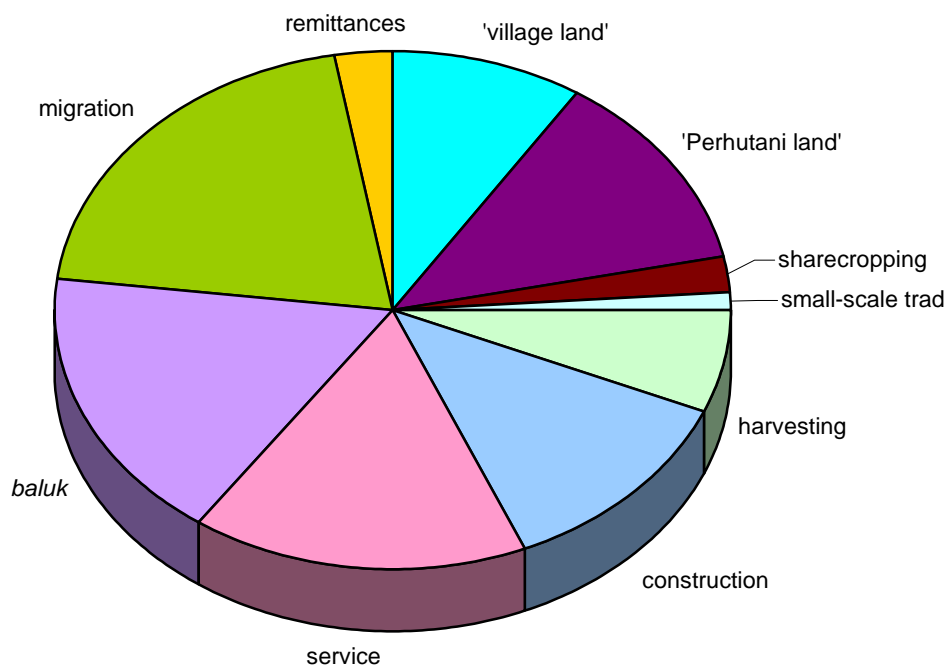
**Figure 19. Income Portfolio – Tercile II**
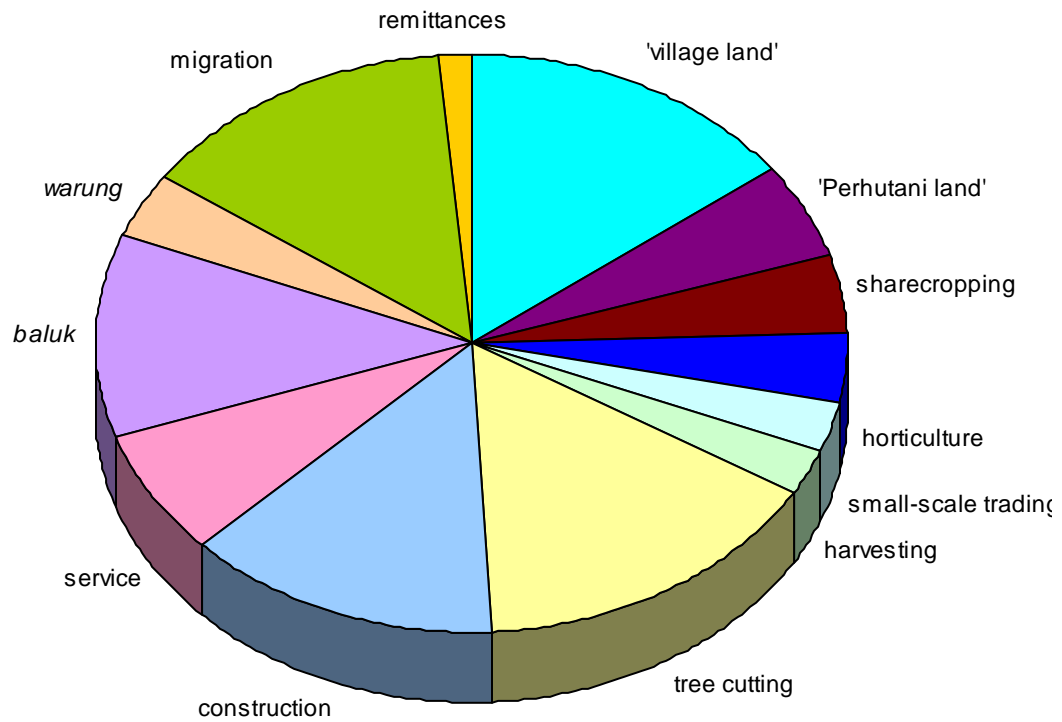


**Figure 20. Income Portfolio – Tercile III**
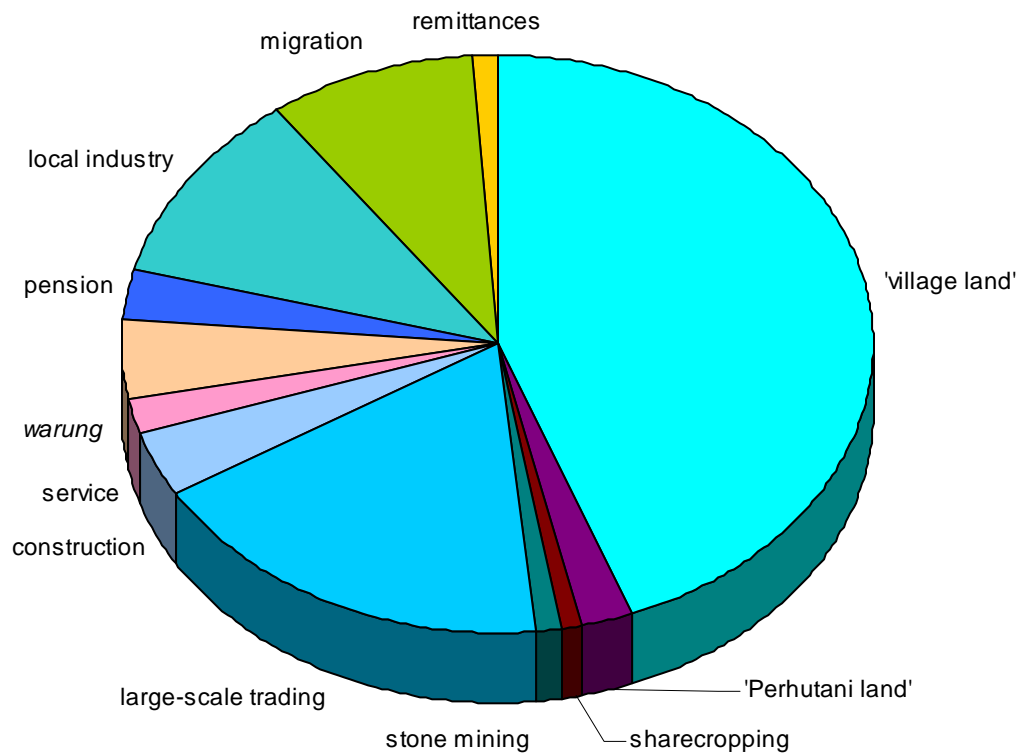
**Table 19. Mean Incomes by Livelihood Activity and Income Tercile**

| Livelihood Activity | | Income Tercile | | |
|---|---|---|---|---|
| | | I | II | III |
| 'village land' | mean income/hh (Rp) | 965,000 | 1,806,200 | 10,819,500 |
| | no. of households | 2 | 5 | 8 |
| 'Perhutani land' | mean income/hh (Rp) | 367,143 | 1,106,000 | 1,086,000 |
| | no. of households | 7 | 7 | 4 |
| sharecropping | mean income/hh (Rp) | 480,000 | 453,500 | 615,333 |
| | no. of households | 1 | 6 | 3 |
| *A-F – TOTAL* | mean income/hh (Rp) | 553,333 | 1,507,000 | 8,431,455 |
| | no. of households | 9 | 10 | 11 |
| *ONR – TOTAL* | mean income/hh (Rp) | 0 | 2,400,000 | 2,000,000 |
| | no. of households | 0 | 1 | 1 |
| harvesting | mean income/hh (Rp) | 330,000 | 771,000 | - |
| | no. of households | 4 | 2 | - |
| tree cutting | mean income/hh (Rp) | - | 4,800,000 | - |
| | no. of households | - | 2 | - |
| small-scale trading | mean income/hh (Rp) | 230,000 | 825,000 | - |
| | no. of households | 1 | 2 | - |
| large-scale trading | mean income/hh (Rp) | - | - | 11,833,333 |
| | no. of households | - | - | 3 |
| construction | mean income/hh (Rp) | 2,520,000 | 2,824,333 | 7,000,000 |
| | no. of households | 1 | 3 | 1 |
| service | mean income/hh (Rp) | 1,662,400 | 1,453,333 | 3,480,000 |
| | no. of households | 2 | 3 | 1 |
| *baluk* | mean income/hh (Rp) | 1,200,000 | 1,750,000 | - |
| | no. of households | 3 | 4 | - |
| *warung* | mean income/hh (Rp) | - | 2,160,000 | 2,920,000 |
| | no. of households | - | 1 | 3 |
| pension | mean income/hh (Rp) | - | - | 5,700,000 |
| | no. of households | - | - | 1 |
| local industry | mean income/hh (Rp) | - | - | 21,000,000 |
| | no. of households | - | - | 1 |
| migration | mean income/hh (Rp) | 1,393,333 | 2,866,667 | 8,625,000 |
| | no. of households | 3 | 3 | 2 |
| remittances | mean income/hh (Rp) | 200,000 | 425,000 | 801,667 |
| | no. of households | 3 | 2 | 3 |
| *non-farm - TOTAL* | mean income/hh (Rp) | 1,752,756 | 3,686,250 | 11,232,778 |
| | no. of households | 9 | 12 | 9 |
| **TOTAL** | mean income/hh (Rp) | **1,596,523** | **4,746,538** | **15,064,692** |
| | no. of households | 13 | 13 | 13 |

Drawing upon a second disaggregate of 'income categories', the distribution of activities and incomes across wealth is fairly similar. The 'poor' group, making up a large percentage of the total population (54%), again engage in the same ten activities (with the addition of tree cutting) at roughly the same proportion to income tercile I (Figure 21). The 'middle' category is likewise distributed relatively similarly to income tercile II, although the significance of 'village land' and migration activities have grown (Figure 22). The 'wealthy' category is the most distinct compared to its tercile predecessor, as except for some minor additions these households are entirely dependent on 'village land' and either large-scale trading or local industry (Figure 23).

Many similarities to income terciles also exist when comparing mean incomes across income categories, as the 'poor' consistently earn minimal returns for all activity types while the 'wealthy' earn grossly more substantial incomes from 'village land' and key non-farm sources (Table 20). However, what is more alarming when disaggregating households by income category is the highly inequitable distribution of income that is revealed (Table 21). The 'poor' make up 54% of the total household population, yet together they produce only 21% of total village income, while the 'wealthy' who account for 10% of the household population produce 42% of total village income. Clearly, understanding the specific challenges faced by 'poor' households in constructing their livelihoods is therefore a critical endeavour. The key task is to build off of the quantitative findings that have been presented thus far, which have outlined the distribution of activities according wealth, in order to build 'livelihood strategy typologies'.

## Figure 21. Income Portfolio – 'Poor'
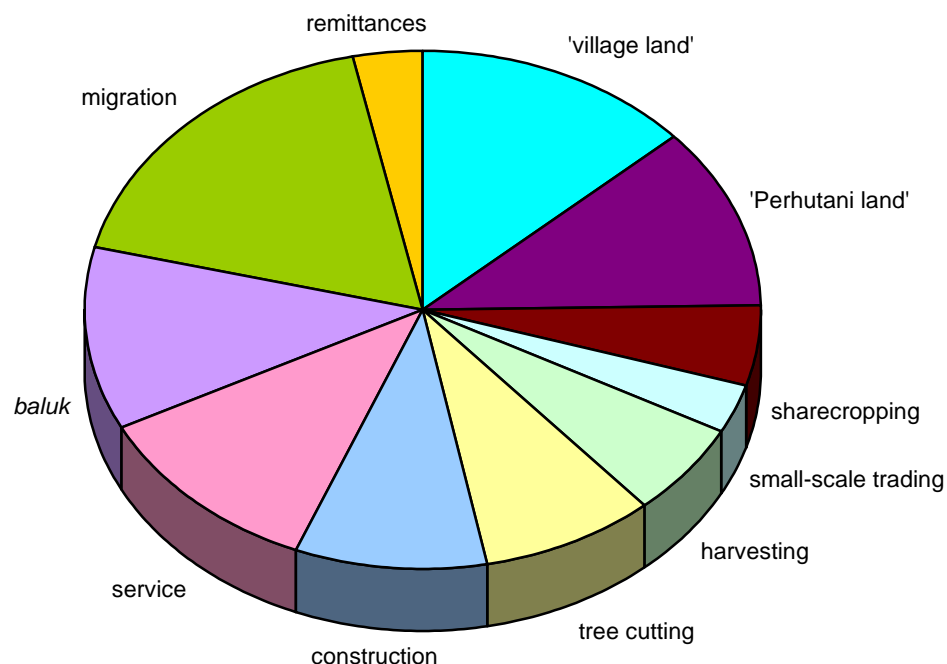
**Figure 22. Income Portfolio – 'Middle'**
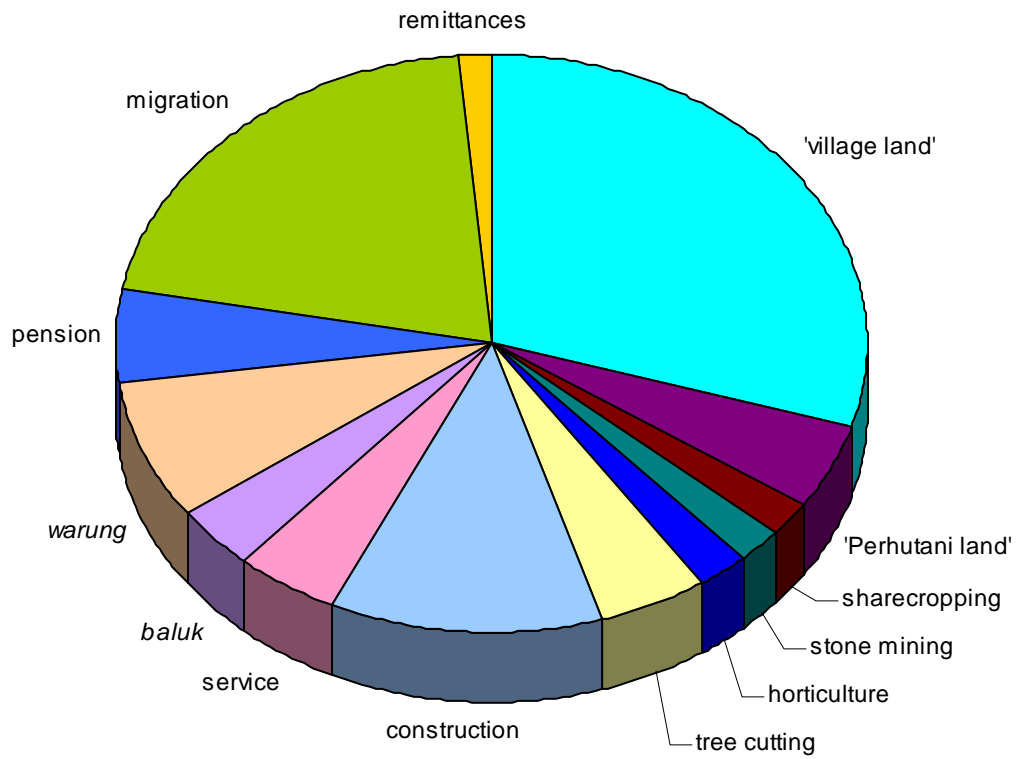


**Figure 23. Income Portfolio – 'Wealthy'**
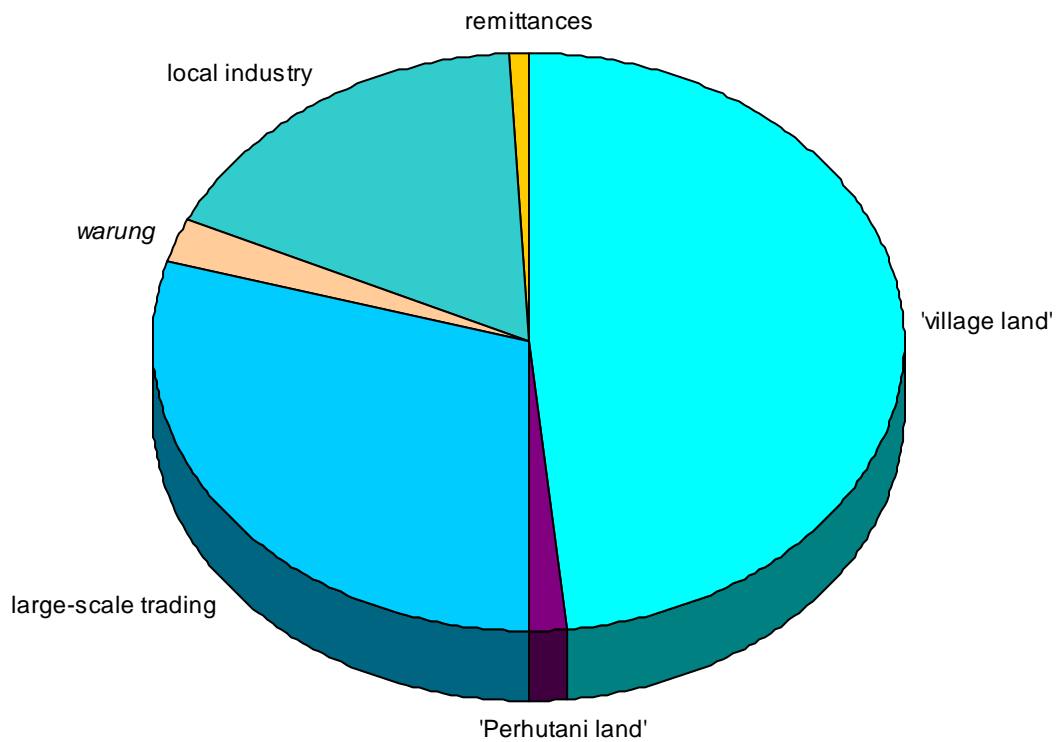
## Table 20. Mean Incomes by Livelihood Activity and Income Category

| Livelihood Activity | | Income Category | | |
|---|---|---|---|---|
| | | 'poor' | 'middle' | 'wealthy' |
| 'village land' | mean income/hh (Rp) | 1,574,600 | 5,220,666 | 14,580,000 |
| | *no. of households* | *5* | *6* | *4* |
| 'Perhutani land' | mean income/hh (Rp) | 826,500 | 1,231,500 | 1,035,000 |
| | *no. of households* | *8* | *4* | *2* |
| sharecropping | mean income/hh (Rp) | 493,500 | 521,500 | - |
| | *no. of households* | *6* | *4* | - |
| *A-F – TOTAL* | mean income/hh (Rp) | 1,090,375 | 3,833,600 | 15,097,500 |
| | *no. of households* | *16* | *10* | *4* |
| *ONR – TOTAL* | mean income/hh (Rp) | - | 2,200,000 | - |
| | *no. of households* | *-* | *2* | *-* |
| harvesting | mean income/hh (Rp) | 570,333 | - | - |
| | *no. of households* | *6* | - | - |
| tree cutting | mean income/hh (Rp) | 4,800,000 | 4,800,000 | - |
| | *no. of households* | *1* | *1* | - |
| small-scale trading | mean income/hh (Rp) | 626,666 | - | - |
| | *no. of households* | *3* | - | - |
| large-scale trading | mean income/hh (Rp) | - | - | 11,833,333 |
| | *no. of households* | - | - | *3* |
| construction | mean income/hh (Rp) | 1,831,000 | 6,250,000 | - |
| | *no. of households* | *3* | *2* | - |
| service | mean income/hh (Rp) | 1,681,200 | 2,220,000 | - |
| | *no. of households* | *4* | *2* | - |
| *baluk* | mean income/hh (Rp) | 1,320,000 | 2,000,000 | - |
| | *no. of households* | *5* | *2* | - |
| *warung* | mean income/hh (Rp) | - | 2,680,000 | 2,880,000 |
| | *no. of households* | - | *3* | *1* |
| pension | mean income/hh (Rp) | - | 5,700,000 | - |
| | *no. of households* | - | *1* | - |
| local industry | mean income/hh (Rp) | - | - | 21,000,000 |
| | *no. of households* | - | - | *1* |
| migration | mean income/hh (Rp) | 2,116,000 | 7,150,000 | - |
| | *no. of households* | *5* | *3* | - |
| remittances | mean income/hh (Rp) | 378,000 | 762,500 | 880,000 |
| | *no. of households* | *5* | *2* | *1* |
| *non-farm - TOTAL* | mean income/hh (Rp) | 2,434,694 | 6,939,444 | 15,065,000 |
| | *no. of households* | *17* | *9* | *4* |
| **TOTAL** | mean income/hh (Rp) | **2,801,705** | **7,513,643** | **30,162,500** |
| | *no. of households* | *21* | *14* | *4* |

**Table 21. Income Distribution by Income Category**

| | Income Category | | |
| --- | --- | --- | --- |
| | 'poor' | 'middle' | 'wealthy' |
| % of hh population | 54% | 36% | 10% |
| *total income (Rp)* | *58,835,800* | *105,191,000* | *120,650,000* |
| % of village income | 21% | 37% | 42% |

## 5.5. Livelihood Strategy Typologies

The challenge in interpreting the income portfolio data presented above is to understand that they are representations of the income sources of household groupings and thus they incorporate between 6 to13 livelihood activities that are collectively engaged in by all members. However, as Tables 19 and 20 clearly illustrate, not all of the households of any one group conduct all relevant activities. In fact, individual households within all wealth groups generally conduct only four activities or fewer (Tables 22 and 23). This critical distinction between the activities of a group and those of a household separate a simple income portfolio from a 'livelihood strategy'.

**Table 22. Number of Activities Per Household by Income Tercile**

| Total no. of activities* | Income Tercile | | | |
| --- | --- | --- | --- | --- |
| | I | II | III | ALL |
| 1 | 4 | 1 | 3 | 8 |
| 2 | 5 | 4 | 5 | 14 |
| 3 | 3 | 4 | 3 | 10 |
| 4 | 1 | 4 | 1 | 6 |
| 5 | 0 | 0 | 1 | 1 |
| **Total** | 13 | 13 | 13 | 39 |
| *mean/household* | *2.08* | *2.85* | *2.38* | *2.44* |

*Note: On basis of 1 for each of 3 agro-forestry land use systems; 1 for an Other Natural Resource activity; and 1 for each of 12 non-farm activities.

**Table 23. Number of Activities Per Household by Income Category**

| Total no. of activities* | Income Category | | | |
| --- | --- | --- | --- | --- |
| | 'poor' | 'middle' | 'wealthy' | ALL |
| 1 | 5 | 3 | 0 | 8 |
| 2 | 6 | 6 | 2 | 14 |
| 3 | 6 | 3 | 1 | 10 |
| 4 | 4 | 2 | 0 | 6 |
| 5 | 0 | 0 | 1 | 1 |
| **Total** | 21 | 14 | 4 | 39 |
| *mean/household* | *2.43* | *2.29* | *3.00* | *2.44* |

*Note: On basis of 1 for each of 3 agro-forestry land use systems; 1 for an Other Natural Resource activity; and 1 for each of 12 non-farm activities.

Situated at the core of the livelihoods model, a livelihood strategy represents the specific combination of activities selected by a given household. The ability to engage in each activity is of course dependent upon the household's access to assets, which in turn is mediated by a number of internal and external factors and forces. The particular mix of activities also naturally determines the level and security of income produced.

Focusing on livelihood strategies is the most effective and realistic means of understanding the specific challenges of maintaining and enhancing well-being and security for different households. The process of identifying types of livelihood strategies has already been significantly guided by disaggregating activity engagement by wealth as done above. The next step involves sorting through the households to match those with similar combinations of activities, which is also aided by the qualitative-based data collected during the fieldwork. The output is the identification of six unique 'livelihood strategy typologies' representing the livelihood circumstances of Saninten households (Figure 24).

**Figure 24. Distribution of Households by Livelihood Strategy Typology**
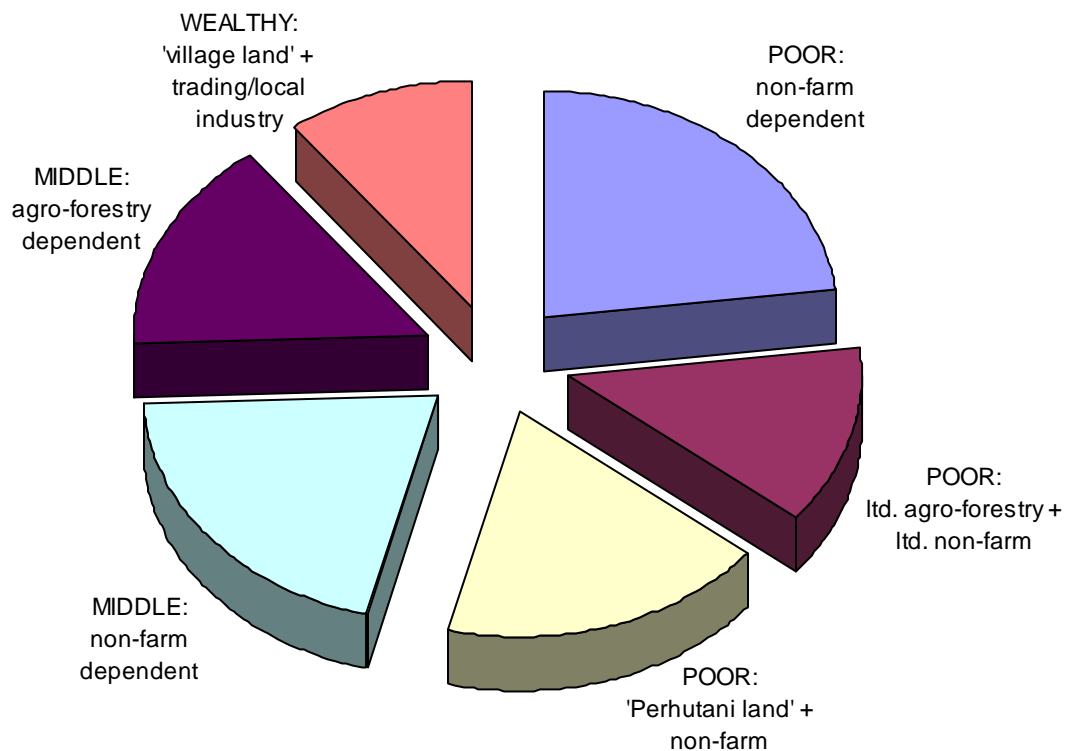


The 'poor non-farm dependent' are a dominant group in Saninten village, incorporating nearly one quarter of all households. Their livelihood strategy portfolios consist of non-farm activities with low barriers to entry, such as harvesting, small-scale trading, unskilled construction labour, service work, *baluk* tasks, and migration. In most cases, a single household combines 2 or 3 non-farm activities often split between the male and female household heads with the former engaged in harvesting, small-scale trade, or migration while the latter

conducts *baluk* work.  However, in some cases the household may depend upon a single non-farm activity such as tree cutting, construction, or a particular service. This type of household is completely landless, neither owning 'village land' nor 'Perhutani land', although they may engage in minimal sharecropping activities. Thus, a typical livelihood strategy portfolio of this typology is dominated by an average of two non-farm sources and a limited supplement from sharecropping (Figure 25).  Overall this group is among the most vulnerable, suffering from no 'natural capital' and limited 'human', 'physical' and 'financial' assets, which greatly restricts their livelihood options and confines them to minimal annual income generation of **Rp 3,188,889**.

**Figure 25. Livelihood Strategy of "Poor: Non-farm Dependent" Household**

**tertiary source:**
sharecropping;
mean income =
Rp 262,222

**secondary source:** harvesting,
s-s trading, *baluk;*
mean income =
Rp 712,444

**primary source:**
tree cutting,
construction,
service, migration;
mean income =
Rp 2,214,222
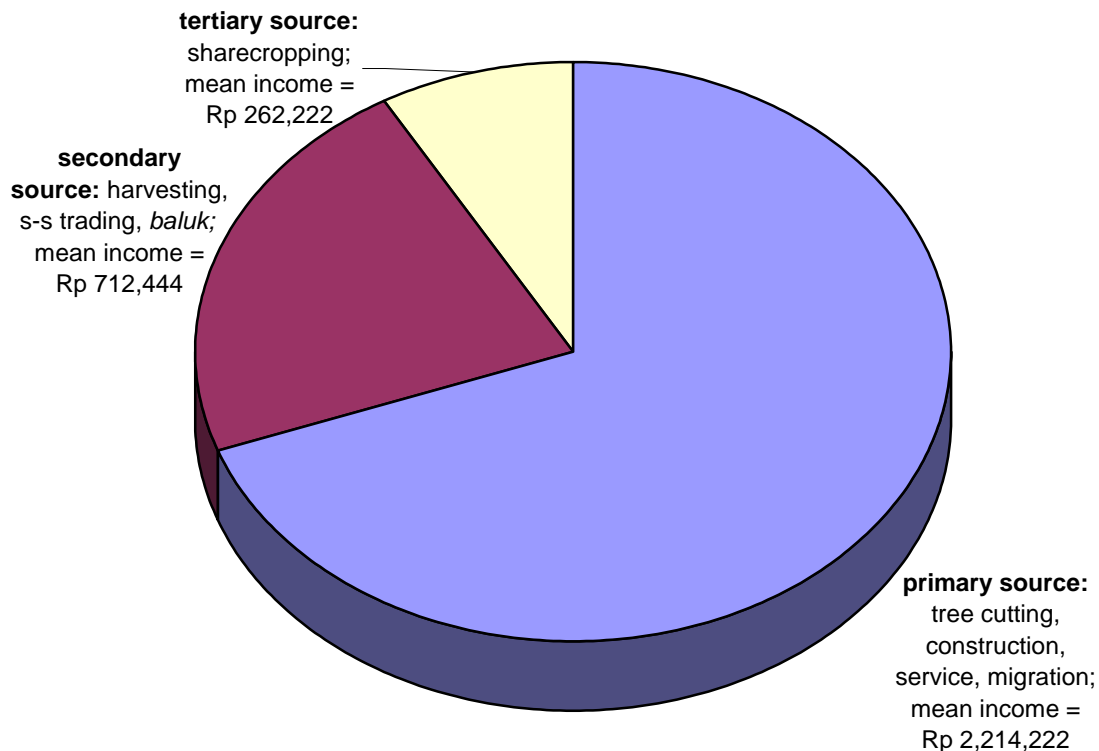
Making up 13% of all households, the second typology group are largely dependent upon the cultivation of 'village land' for their total income.  However, the productivity and profitability of their 'natural capital' tends to be limited due to another factor, most often a lack of 'human capital' resulting from old age, ill health or disability.  Thus, they are unable to take advantage of the potential of their land and subsequently generate minimal agro-forestry incomes relative to land size (only Rp 4,330,300/hectare compared to an average of Rp 9,486,089/ hectare).  About half of this group are entirely dependent on this dwindling source for their total income, while the other households incorporate a supplementary non-farm activity such as where a female head acts as a mid-wife, a male head conducts small-scale trading of agricultural products, or a son provides labour for construction.  Thus, a typical livelihood strategy of this typology is dominated by

income from 'village land', but at a low level of return, supplemented by a non-farm source, generating a total income of **Rp 2,759,800** (Figure 26). Due to their more advanced age, this group also tends to receive minimal remittances from adult children who have moved out of the resident household. A single household also cultivates 'Perhutani land'.

**Figure 26. Livelihood Strategy of "Poor: Agro-forestry + Non-farm" HH**

**tertiary source**:
remittances;
mean income =
Rp 170,000

**secondary source:** s-s trading,
service;
mean income =
Rp 875,000

**primary source:**
'village land';
mean income =
Rp 1,714,800
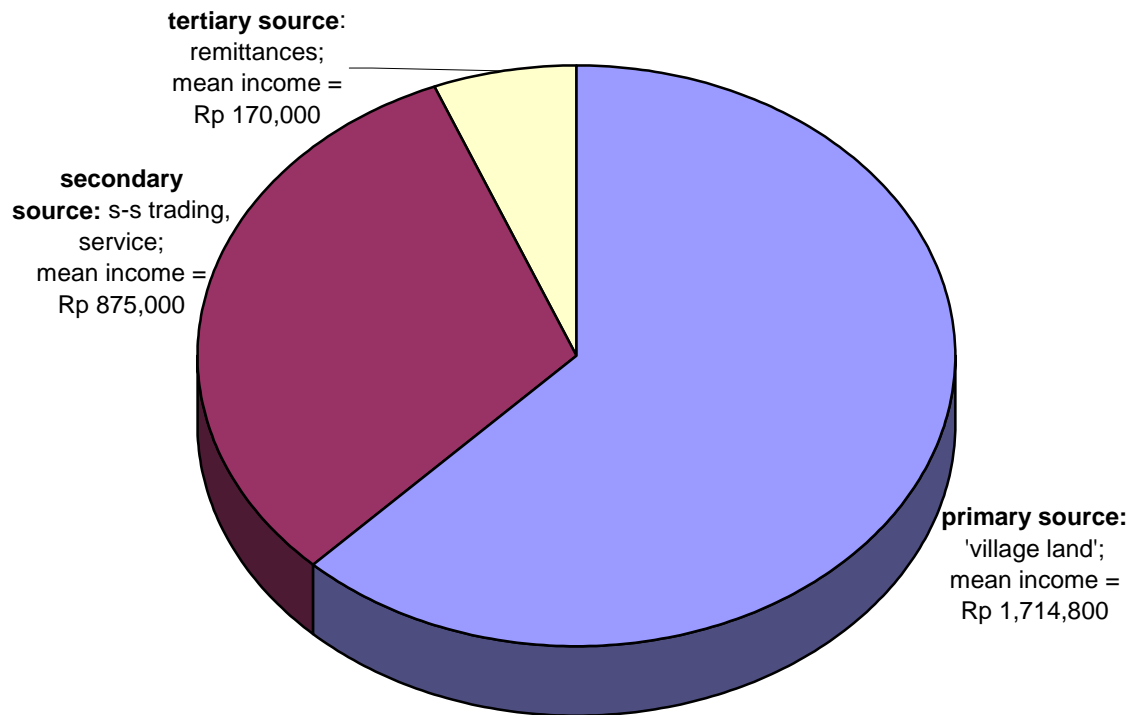
The third and final 'poor' group are characterized by their access to critical 'natural capital' in the form of 'Perhutani land', which they gained through the 'Social Forestry' program of the state corporation. Prior to receiving such land these households would have strongly resembled the "poor: non-farm dependent" households, relying upon such non-farm activities as migration, *baluk* work and harvesting. Since receiving the new access many have begun to cease or reduce these activities as they grow more confident of the potential of their agro-forestry opportunities. However, almost all continue a central non-farm activity while they wait for their 'Perhutani land' to become more productive and profitable, thus constructing dual livelihood strategies (Figure 27). Many also conduct seasonal harvesting work or receive remittances as a supplementary source, producing a total annual income of **Rp 2,333,829.**

The households of the "middle: non-farm dependent" typology are very similar to those of the corresponding 'poor' group, as they also depend entirely upon major non-farm activities in the absence of private land. The simple difference is that these better-off households are able to access more highly remunerated non-

**Figure 27. Livelihood Strategy of "Poor: 'Perhutani land' + Non-farm" HH**

tertiary source: harvesting, remittances; mean income = Rp 374,971

primary source: migration, *baluk;* mean income = Rp 1,028,571

secondary source: 'Perhutani land'; mean income = Rp 930,286
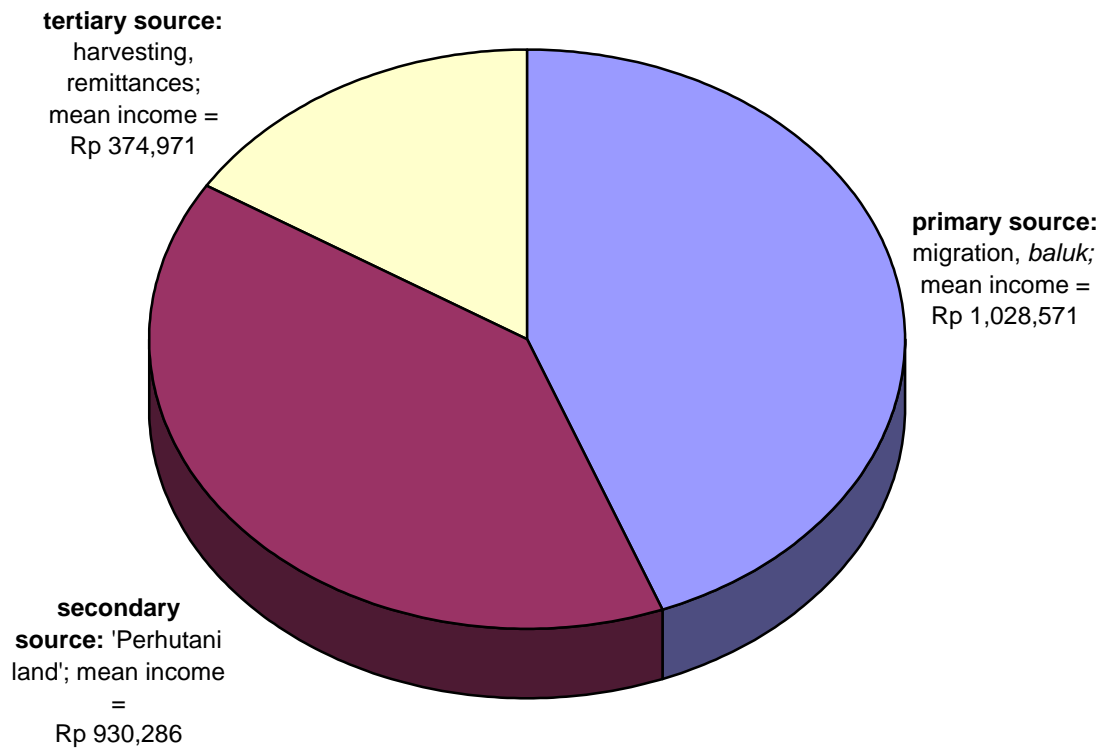
farm activities. For example, members receive substantial wages for skilled construction work or electrical installations and repairs, they operate profitable shops, they receive a significant pension, or they engage in lucrative migration occupations such as running a business or providing security guard services. Approximately half of the households of this group rely solely on a single one of these non-farm sources, while the other half combine two between the household heads. Thus, a typical livelihood strategy of this typology involves dual income sources, occasionally supplemented by minimal sharecropping, generating a total household income of **Rp 7,786,875** (Figure 28). A small percentage also has access to 'Perhutani land'.

The second 'middle' typology is fairly simple in that the households of this group are almost entirely dependent upon agro-forestry, and almost exclusively on the cultivation of 'village land' alone. The only exception is where a small percentage of these households may have gained accessed to 'Perhutani land' or where they conduct sharecropping, each as an extension of their normal agro-forestry tasks. As well, some use their abundant 'natural capital' for the activity of stone mining, and a few individuals have expanded their farming knowledge into horticulture. Overall however, their livelihood strategies are dominated by 'village land' with only a minimal supplement to generate a total household income of **Rp 7,149,333** (Figure 29).

## Figure 28. Livelihood Strategy of "Middle: Non-farm Dependent" Household

**tertiary source:**
sharecropping;
mean income =
Rp 412,500

**secondary
source:** *warung,
baluk;*
mean income =
Rp 2,095,625

**primary source:**
tree cutting,
construction,
electrician,
migration;
mean income =
Rp 5,278,750
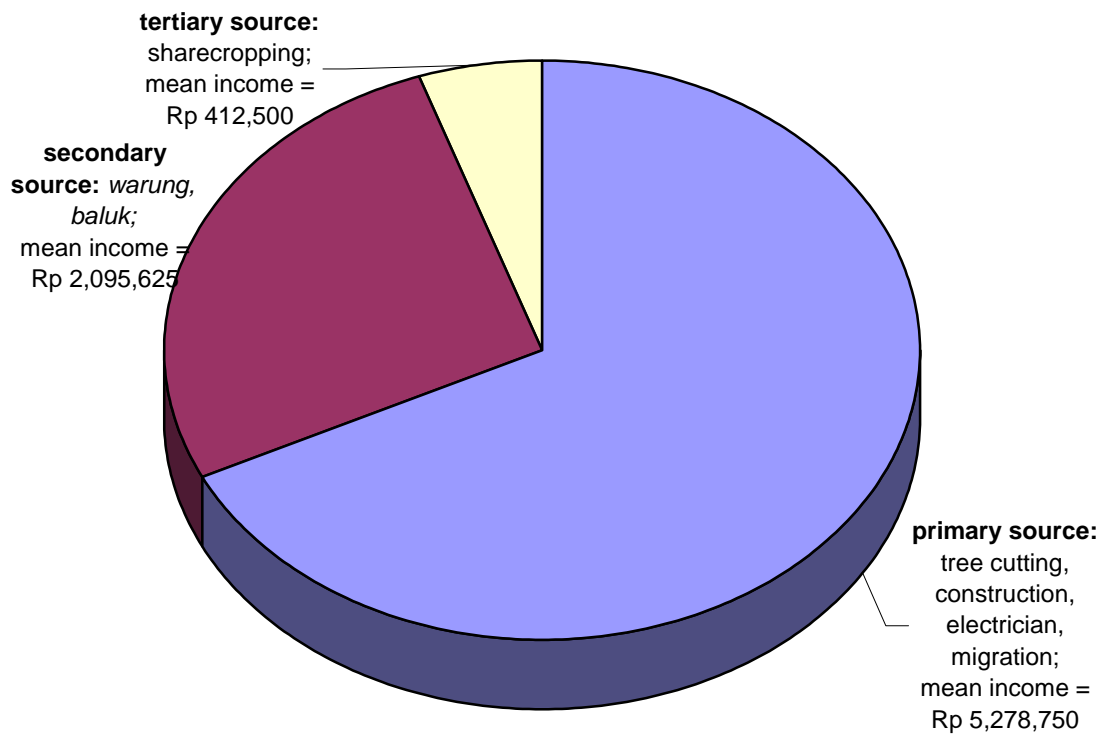
## Figure 29. Livelihood Strategy of "Middle: Agro-forestry Dependent" HH

**secondary
source:** 'Per. Land,
share- cropping,
ONR; mean income
=
Rp 1,352,000

**primary source:**
'village land';
mean income =
Rp 5,797,333
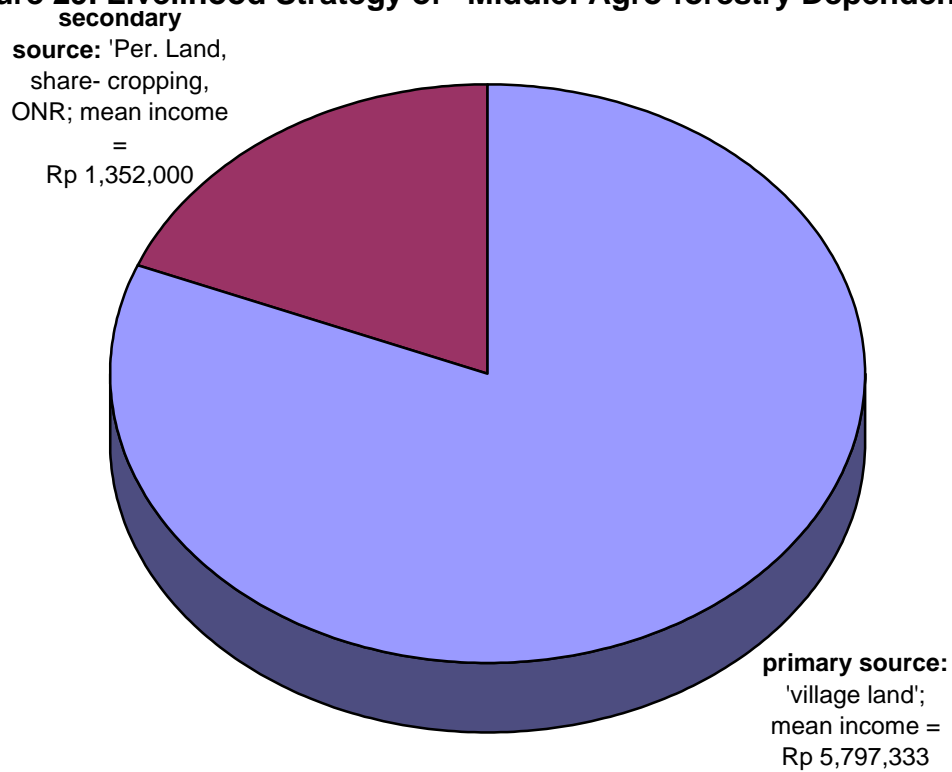
The final, most wealthy typology is also fairly simple as it involves two straight-forward activities producing a mean total income of **Rp 30,162,500** (Figure 30). The first is the cultivation of 'village land', which due to large plot sizes generates the highest agro-forestry incomes of all households. The second is either the large-scale trading of agricultural outputs, conducted by three quarters of this group, or the operating of local industry, in this case a coffee-grinding mill. Only in limited amounts are these supplemented by 'Perhutani land', operating a *warung*, and remittances.

**Figure 30. Livelihood Strategy of "Wealthy: 'Village Land' + Non-farm" HH**



**tertiary source:**
'Perhutani land',
warung, remitt's;
mean income =
Rp 1,457,500

**primary source:**
'village land';
mean income =
Rp 14,580,000

**secondary source:** large-scale trading, local industry; mean income = Rp 14,125,000
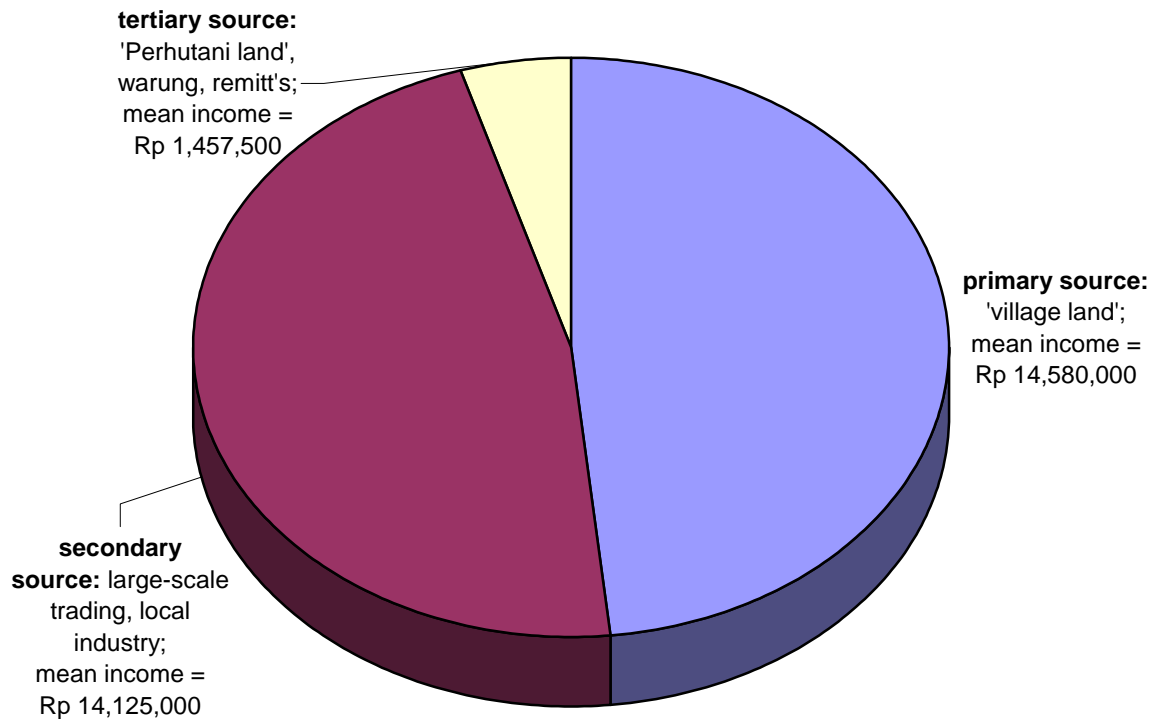
Comparing assets, activities, and incomes across livelihood strategy typologies suggests a few final key findings (Table 24). Clearly the ownership of 'village land' is a key criterion of livelihood security, as the two wealthiest groups own the greatest amount of this type of 'natural capital'. Access to 'Perhutani land' is obviously the highest for those categorized by its use, whom earn the lowest mean total incomes. This indicates that access to forest land is not yet enough to guarantee adequate incomes. Total household size or the number of economically active adults does not appear to be a significant factor for most groups, although the wealthiest typology has the highest of these figures. Age appears to be significant for the second 'poor' category, who suffer from low labour productivity due to their old age. Education is clearly positively correlated with wealth. Finally, the quantitative survey has uncovered a distinct and highly inequitable disparity of total incomes.

**Table 24. Assets, Activities, and Incomes by Livelihood Strategy Typology**

| | POOR: non-farm dependent | POOR: ltd. agro-forestry + ltd. non-farm | POOR: 'Perhutani land' + non-farm | MIDDLE: non-farm dependent | MIDDLE: agro-forestry dependent | WEALTHY: 'village land' + trading/ local industry |
|---|---|---|---|---|---|---|
| **Natural Capital (ha.)** | | | | | | |
| 'village land' | 0.00 | 0.29 | 0.00 | 0.00 | 0.82 | 0.99 |
| 'Perhutani land' | 0.00 | 0.05 | 0.46 | 0.06 | 0.08 | 0.19 |
| sharecropping land | 0.08 | 0.06 | 0.04 | 0.05 | 0.17 | 0.00 |
| **Human Capital** | | | | | | |
| Household Size (Actual – resident) | 6.0 | 6.2 | 6.6 | 5.8 | 6.8 | 8.5 |
| Household Size (EAAs – resident) | 2.9 | 2.8 | 3.3 | 2.9 | 2.7 | 3.5 |
| Age of Male Household Head | 40 | 56 | 43 | 44 | 49 | 41 |
| Age of Female Household Head | 34 | 48 | 35 | 39 | 39 | 35 |
| Education of Male HH Head (years) | 6 | 6 | 6 | 6.375 | 6.5 | 7.5 |
| Education of Female HH Head (years) | 6 | 6 | 6 | 6.375 | 6 | 6.75 |
| **Activity Distribution** | | | | | | |
| % agro-forestry in total income | 7% | 62% | 29% | 6% | 100% | 62% |
| % non-farm in total income | 93% | 38% | 71% | 94% | 0% | 38% |
| **Mean Incomes** | | | | | | |
| TOTAL | **3,188,889** | **2,759,800** | **2,333,829** | **7,786,875** | **7,149,333** | **30,162,500** |

## 6.0  PROFILE OF 'PERHUTANI LAND' FOREST-FARMERS

The current analysis forms an essential component of a broader research project which takes as its focus an examination of the linkages between the micro-level livelihood realities of rural households and the policy and institutional factors that mediate their relative security.  In the context of Saninten village, the specific area of interest in this regard is the relationship between local agro-forestry livelihoods (assets, activities and incomes) derived from 'Perhutani land' and the policy and implementation of Joint Forest Management (PHBM – *Pengelolaan Hutan Berbasis Masyarakat*).  While much information concerning this issue has already been discussed and outlined, it is useful to provide a clear and concise profile of the forest-farmer households currently accessing 'Perhutani land' to understand at the micro level the impact of the JFM program on local livelihoods.

### 6.1.  Background to Gaining Access to 'Perhutani Land'

The granting of official access to forest land began under the banner of 'Social Forestry' (PS – *Perhutanan Sosial*).  This policy, adopted by Perhutani in the late 1980s, represented a new attempt to manage the relationship between communities and forest resources.  For Perhutani, PS was a means of appeasing the discontent of forest-based communities and their demand for land.  By handing the task over to local people, the program also provided Perhutani with the benefit of the reforestation of their barren land. For those rural households fortunate enough to gain access, the realization of the policy represented the acquisition of new and critical 'natural capital'.

In Saninten, the PS program was not implemented until 1997, when Perhutani, through its local representative (*Mandor* – foreman), communicated to certain individuals that a limited amount of forest land would be made available for local use. This news was then selectively spread through the village and an informal registration was taken orally by a village representative.  Perhutani subsequently announced that they would hold a distribution day when 14 hectares of forest land would be allocated to interested individuals. On the day, many people came to measure and mark the land along with Perhutani, but only 56 persons ultimately received access to land (on a first-come first-served basis), with four persons each managing one hectare.  As required, the recipients were formed into three Forest Farmer Groups (KTH – *Kelompok Tani Hutan*) and each appointed a leader to represent the group in their contact with Perhutani. Farmers were later supplied mahogany seedlings and informed of spacing requirements for re-planting, and were told that they were then free to cultivate crops in between these main species. The same basic process of land distribution repeated itself in 1998 with an additional 6 hectares, creating a fourth KTH and bringing the total number of households with access to 'Perhutani land' to 80.

While the granting of land access thus appears to have been relatively open and equitable, there are several key factors that intervened on this process.  First is the

importance of social relationships, as the research revealed that the crucial stage of informing village members about the program was done between family – from the *Mandor*, Perhutani's local representative, to his brother, a respected figure among farmers who resides in Kampung Salam. The farmers' representative subsequently communicated the message orally, primarily to his friends, family, and fellow Kampung members. Second is the location of the household, as those furthest from the opened forest land were unlikely to be interested in the new access due to the distance they would have to travel to maintain the land. Together these two factors account for the initial distribution of the first 80 households, estimated as follows: 60% from Salam, 20% from Malang and Malangsari, 18% from Sukamanah, and 2% from Campaka. The majority to have thus gained access came from Kampung Salam, being socially closest to the farmers' representative and physically closest to the actual forest land. The final factor involves migration, where several households reported that they did not receive land because they were away from the village conducting seasonal migration activities on the distribution days.

The shift in official Perhutani policy from 'Social Forestry' (PS) to 'Joint Forest Management' (PHBM) emerged during the period of socio-political instability that emerged in the wake of the resignation of President Suharto in May 1998. The new policy represented yet another attempt to placate local frustrations, which were resulting in unprecedented levels of forest encroachment and illegal logging. However, there was little direct substance and few implementation guidelines behind the policy. Thus, it superimposed only vague notions of alternative rules and regulations governing access to forest land over the on-the-ground reality of what had been implemented under PS.

In other communities and districts the opportunity that PHBM provides has been taken up by NGOs and local people in collaboration with other stakeholders to build systems of genuine local participation in forest management. Specifically, many villages and KTH groups have been successful at signing agreements with Perhutani that outline the terms and conditions of management and rules of profit-sharing, where local people earn the majority of revenues from mixed agro-forestry cultivation while Perhutani retains the bulk share of revenues from timber. However, in Saninten such progress has not yet been fully made. Rather, increased knowledge of PHBM policy has mainly altered local attitudes concerning the potential for long-term tenure and more equal relationships with Perhutani, and the specific opportunities for improved and official profit-sharing and greater local control of forest management.

## 6.2. Location and Wealth of Forest-Farmer Households

The original estimation of the distribution of forest-farmer households by *Kampung* seems to have equalized somewhat since 1997 (Figure 31). However, those residing closest to the 'Perhutani land' forest block still dominate the total percentage of forest-farmer households, and very few households from distant

locations (the Cikupa settlement area containing 5 Kampungs and Kayu Ambon in the southern portion of the village) are involved in cultivating 'Perhutani land'.

**Figure 31. Forest-Farmer Households by *Kampung***
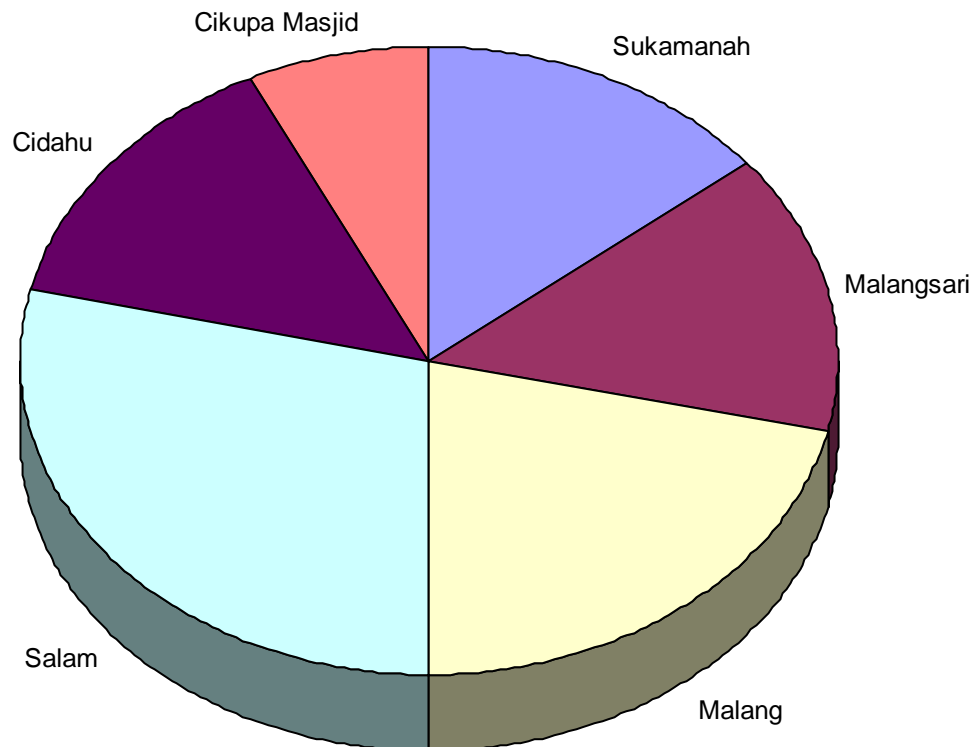


The majority of 'Perhutani land' users fall within the 'poor' income category (Figure 32), which contrasts with 'village land' users who are primarily 'middle' or 'wealthy' (Figure 33). What this suggests is that 'Perhutani land' does not yet generate a significant amount of income. At the same time, this signifies that the PS program has had its greatest impact among poorer households, as without such agro-forestry incomes the 'poor' households would certainly be worse off, and even half of the 'middle' households would be in the 'poor' category without their income
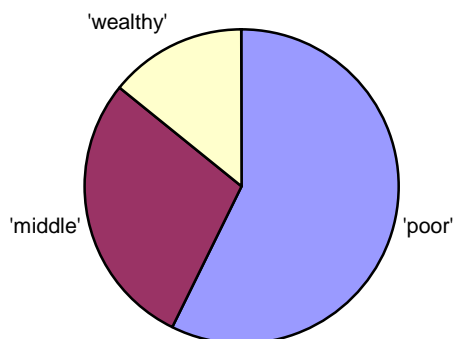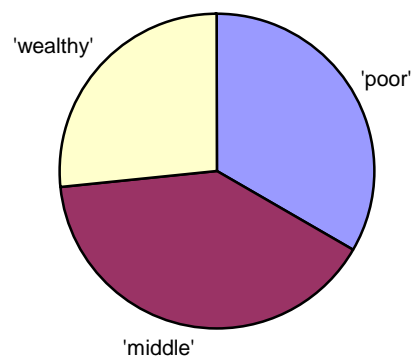
Figure 32. 'Perhutani Land' Users by Wealth

Figure 33. 'Village Land' Users by Wealth

from 'Perhutani land'. Moreover, this finding reflects the fact that securing access and use rights over this land is most important to the livelihoods of the rural poor. Those accessing 'Perhutani land' make up **35%** of the total household population in Saninten village.

## 6.3. 'Human Capital' of Forest-Farmers

There is very little quantitative evidence concerning 'human capital' that separates forest-farmer households from the general village population (Table 25). The sizes of forest-farmer households are very similar to village averages, as are the ages of household heads. Mean education standards as well are highly equal to the village average, with a single forest-farmer household having both a male and female head completing the SMP level. All of this suggests that 'human capital' variables are not a distinct defining characteristic of forest-farmer households.

**Table 25. 'Human Capital' of Forest-Farmer and Sample Households**

|  | Forest-Farmers (n = 14) | Sample Households (n = 40) |
|---|---|---|
| Household Size (Actual – resident) | 6.43 | 6.45 |
| Household Size (EAAs – resident) | 3.21 | 2.98 |
| Household Non-residents | 0.79 | 0.55 |
| Age of Male Household Head | 46.64 | 45.38 |
| Age of Female Household Head | 36.71 | 38.62 |
| Education of Male HH Head (years) | 6.21 | 6.30 |
| Education of Female HH Head (years) | 6.21 | 6.15 |

## 6.4. 'Natural Capital' of Forest-Farmers

The initial distribution of 'Perhutani land' in 1997 and 1998 provided access at a rate of ¼ hectare per household, which continues to be the primary mode for forest-farmer households (Table 26). Of the fourteen forest-farmer households contacted in the sample survey, eleven respondents (79%) were among the original group to have received 'Perhutani land' and they continue to cultivate their ¼ hectare. All of these respondents shared the same story of the process of land distribution. First, they orally registered their interest with the farmers' representative. Later they were informed of the specific day that distribution would take place and they all attended. On the day, Perhutani's district representative (*Mandri*) along with members of the village administration measured the land and these officials ultimately decided who received land and which specific plots.

**Table 26. Size Distribution of Land Accessed by Forest-Farmer Households**

| Area Range | Forest-Farmers (n = 14) |
|---|---|
| 0.25 ha | 11 (79%) |
| 0.50 ha | 1 (7%) |
| 1.00 ha | 2 (14%) |
| *mean* | *0.375* |

Among the original receivers, two households have expanded their landholding to a full hectare by taking over adjoining plots. As well, three households (21%) gained access to 'Perhutani land' by taking over plots that had originally been distributed to another household. Such exchanges of user rights leads to several issues. As a program intended to benefit the livelihoods of the entire community, the permitting of land concentration, whereby single households can amalgamate plots, raises concerns of equity. Since the forest land is not strictly a private resource, but in fact carries the characteristics of common property, a more equitable system might involve a mechanism whereby ¼-hectare plots that are forfeited by households are returned to a village pool to again be fairly distributed. The other issue is the price paid for land transfers, again given the fact that 'Perhutani land' is not a private resource but administered under terms of co-management between farmers and Perhutani.

Ownership of 'village land' among forest-farmer households is more constrained than among the general village population (Table 27). In fact, the majority of current 'Perhutani land' users own no 'village land' at all. This finding again highlights a very important impact of the program, as not only did it benefit the 'poor' but the 'landless poor' in particular. The provision of access to land through Perhutani's program is perhaps the only way that such poor households could ever possibly gain essential 'natural capital' and for all it was their first opportunity to use land and to generate agro-forestry incomes.

**Table 27. Distribution of 'Village Land' by Forest-Farmers and Sample**

| Area Range | Forest-Farmers (n = 14) | Sample (n = 40) |
|---|---|---|
| None | 64% | 60% |
| 0.25 ha. or less | 14% | 10% |
| 0.26 – 0.50 ha. | 7% | 10% |
| 0.51 – 1 ha. | 7% | 12.5% |
| More than 1 ha. | 7% | 7.5% |
| *mean* | *0.18 ha* | *0.26 ha* |

## 6.5. Agro-forestry Incomes from 'Perhutani Land'

While the incomes generated from 'Perhutani land' have been outlined above, for the purpose of this concise profile it is useful to re-state these here. On average, a

forest-farmer household earns Rp 972,000 per year cultivating 'Perhutani land' (Table 28). Yet perhaps a more effective means of understanding the value of 'Perhutani land' is by its income production per ¼-hectare, which is the most common landholding amount (Table 29). Thus, gaining access to a ¼-hectare plot of 'Perhutani land' can earn a household anywhere from Rp 310,000 to as much as Rp 1,660,000. This wide range in the potential productivity of 'Perhutani land' requires some explanation. It is not a result of a particular commodity mix, as the limited combination of banana, coffee, *melinjo*, and avocado are similar for all households. Rather, this appears to be a result of the intensity of cultivation, which in turn is largely a result of labour inputs. Simply, those earning the greatest incomes per hectare tend to cultivate crops, especially banana, at a very high rate.

**Table 28. Distribution of 'Perhutani Land' Agro-forestry Incomes by Household**

| Income Range | Forest-Farmers (n = 14) |
|---|---|
| less than 750,000 | 7 (50%) |
| 750,000 – 1,250,000 | 2 (14%) |
| 1,250,000 – 1,750,000 | 5 (36%) |
| *Mean* | *972,000* |

**Table 29. Distribution of 'Perhutani Land' Agro-forestry Incomes by ¼-Hectare**

| Income Range | Forest-Farmers (n = 14) |
|---|---|
| 300,000 – 499,999 | 4 (29%) |
| 500,000 – 699,999 | 3 (21%) |
| 700,000 – 899,999 | 4 (29%) |
| 900,000 – 1,099,999 | 1 (7%) |
| 1,500,000 – 1,699,999 | 2 (14%) |
| *mean* | *758,643* |

It is critical to understand that the profitability of 'Perhutani land' is largely confined by the current stage of its production system. As described above, the most profitable agro-forestry system involves the integration of a number of major tree species, many of which produce outputs that receive high prices and which can produce substantial amounts. However, it takes a significant amount of time to evolve to this ultimate stage, as the trees grow to full maturity. Thus, the system prevalent on 'Perhutani land' involves income generation from only a limited number of commodities that mature quickly, while waiting to reap income benefits from additional species still at a seedling stage. The most prominent crop is banana, cultivated by 100% of the forest-farmer respondents (Table 30). Banana also generates the highest mean annual income (Table 31). The most popular combination of commodities is banana, coffee, and avocado, although other permutations exist (Table 32).

**Table 30. Crop Cultivation among Forest-Farmers**

| Commodity | % of Forest-Farmers cultivating |
|---|---|
| banana | 100% |
| coffee | 71% |
| avocado | 64% |
| *melinjo* | 21% |

**Table 31. Mean Incomes of Commodities on 'Perhutani Land'**

| Commodity | Mean income for those cultivating the crop |
|---|---|
| banana | 829,714 |
| coffee | 123,200 |
| avocado | 66,667 |
| *melinjo* | 53,333 |

**Table 32. Commodity Mix by Forest-Farmer Households**

| Commodity Mix | % of Forest-Farmers |
|---|---|
| banana only | 14% |
| banana + coffee or avocado | 21% |
| banana/coffee/avocado | 43% |
| banana/*melinjo*/avocado | 14% |
| banana/coffee/*melinjo*/avocado | 7% |

What must again be stressed about the profitability potential of 'Perhutani land' is that it has only begun to develop. Given the average number of pre-productive trees (or seedlings) planted by forest-farmers on a ¼-hectare plot (Table 33), average incomes from 'Perhutani land' are sure to increase. Indeed, it is the expectation of all forest-farmers that their agro-forestry incomes from 'Perhutani land' will continue to grow based on their investments of time, labour, and finances. However, it is important to remember that the 'Perhutani land' system will never fully equate to the 'village land' system, as the former will always be more limited by the high density of mahogany trees that are of no direct economic benefit to the farmers.

**Table 33. Mean Number of Seedlings on ¼-hectare of 'Perhutani Land' by Commodity**

| Commodity | seedlings per ¼-hectare |
|---|---|
| coffee | 29 |
| durian | 11 |
| *melinjo* | 15 |
| *petai* | 11 |
| cloves | 14 |
| avocado | 10 |

Yet increased production is not the only factor that will affect the total incomes earned from 'Perhutani land' in the future, as they will also have to accommodate the terms of profit-sharing with Perhutani.  In fact, this is already reducing such incomes to varying degrees.  The majority of respondents agreed that current rules dictate that 25% of coffee outputs are to be shared with Perhutani.  However, this seems to be highly informal and flexible.  Approximately one third of the forest-farmer households reported having made some contribution of crop outputs to Perhutani through informal transactions.  The other households understand this as a potential and are willing to share a percentage of their yields from 'Perhutani land' if asked, but they have not yet done so.

## 6.6.  Livelihood Strategies of Forest-Farmer Households

Due to the limited current profitability of cultivating 'Perhutani land', the majority of forest-farmer households (86%) combine this income source with additional activities to construct their total livelihood strategy.  In fact, of those entirely dependent on 'Perhutani land' (14%), one household survives on a minimal income of Rp 1,536,000 by having taken over adjoining plots for a total of one hectare, while the other household, cultivating only a ¼-hectare plot, is the poorest in the sample (Rp 630,000 annual income).  Thus, most households are forced to rely on activities outside of cultivating 'Perhutani land' in order to survive.

The distribution of these additional activities among forest-farmer households is nearly as diverse as among the general population (Table 34). This again suggests that perhaps forest-farmers are not highly distinct from an average village household.  However, there are several key findings that can be extracted from this general picture.

Involving half of the forest-farmer households, the most common livelihood strategy form is a combination of cultivating 'Perhutani land' with one or two non-farm activities (harvesting, *baluk*, *warung*, pension, migration).  The non-farm income makes up the greatest proportion of total income with ranges based on the particular activities.  At the low end, where the only additional income-earning activity is minimally profitable harvesting, the non-farm share of total income is approximately 67%.  At the high end, where a household conducts two relatively highly remunerated activities, migration and operating a *warung*, the proportion can be as high as 90%.

The second basic livelihood strategy form is very similar except that the ownership of a small portion of 'village land' (0.15 hectares) lessens the importance of a non-farm or other natural resource income source relative to agro-forestry incomes. Representing 14% of all forest-farmers, these households earn half of their income from either horticulture or a combination of service and *baluk* work.  The other half, made up of agro-forestry income, is split 30/20 between 'village land' and 'Perhutani land'.

**Table 34. Additional Income Sources of Forest-Farmer Households**

| Non-farm activity | | Forest-farmer households |
|---|---|---|
| 'village land' | mean income/household | 6,252,000 |
| | *total households* | *5* |
| horticulture | mean income/household | 2,400,000 |
| | *total households* | *1* |
| harvesting | mean income/household | 480,000 |
| | *total households* | *3* |
| large-scale trading | mean income/household | 14,500,000 |
| | *total households* | *2* |
| service | mean income/household | 702,400 |
| | *total households* | *2* |
| *baluk* | mean income/household | 1,833,333 |
| | *total households* | *3* |
| *warung* | mean income/household | 2,880,000 |
| | *total households* | *2* |
| pension | mean income/household | 5,700,000 |
| | *total households* | *1* |
| migration | mean income/household | 3,150,000 |
| | *total households* | *3* |
| remittances | mean income/household | 611,250 |
| | *total households* | *4* |

The third form involves households with both a major non-farm income source and substantial 'village land' agro-forestry incomes. Specifically, the non-farm activity is the large-scale trading of agricultural products and private land ownership is in the range of ½ to 1 ½ hectares. In these cases, the cultivation of 'Perhutani land' becomes a minor supplementary income source, generating less than 6% of total household income.

A final unique form, representing only a single respondent among the forest-farmer households, involves a total dependency on agro-forestry incomes in the absence of non-farm activities. These incomes are split, with two thirds of the total coming from 'village land' and one third produced from 'Perhutani land'.

Thus the cultivation of 'Perhutani land', as a relatively new livelihood activity, has taken on varying levels of importance for different categories of households based on the share of income it generates within the total annual income (Table 35). Obviously, for those households that have ceased all other activities, the importance of 'Perhutani land' to their livelihood security has become fundamental, while for households that otherwise were relying on only limited agro-forestry income from 'village land' it has become a key additional source. On the other end of the spectrum, the incorporation of incomes from 'Perhutani land' into livelihood strategies already dominated by highly lucrative trading and 'village land' sources

has added only a small percentage to the total incomes of 'wealthy' households. Coincidentally, these two 'wealthy' households each gained access to their respective plots of 'Perhutani land' by taking over from an original receiver, which again makes a case for a communal system whereby those more highly in need of land and an alternative income source would have the opportunity to access this resource rather than allowing the wealthy to use their finances and power to take control of it.

**Table 35. Livelihood Strategy Portfolios of Forest-Farmer HHs by Category**

|  | 'Village Land' + 'Per. Land' | 'Perhutani Land' only | Non-farm + 'Per. Land' | N-f/ONR + Agro-forestry | Trading + 'VL' + 'Per. Land' |
|---|---|---|---|---|---|
| non-farm | - | - | 72.6% | 50% | 55% |
| 'village land' | 66% | - | - | 30% | 39.6% |
| 'Perhutani land' | 34% | 100% | 27.4% | 20% | 5.4% |
| Total | 100% | 100% | 100% | 100% | 100% |
| *mean hh income (Rp)* | *962,000* | *1,083,000* | *4,442,829* | *5,800,000* | *31,175,000* |
| % of forest-farmer hhs | 7% | 14% | 50% | 14% | 14% |
| income category | 'poor' | 'poor' | 'poor' (36%) 'mid' (14%) | 'middle' | 'wealthy' |

Making up half of the total forest-farmer households, the most numerous group are those who have combined the use of 'Perhutani land' with one or two central non-farm activities. Along with those entirely dependent on 'Perhutani land', these households are also perhaps the most important group in terms of the impact of the Social Forestry/Joint Forest Management program, as they were all previously landless, the majority are 'poor', and now this agro-forestry income generates more than one quarter of their total annual income. Overall, the policy of granting access to forest land has thus been quite successful in providing 'natural capital' to the landless, and a key income source for many 'poor' households.

For the majority of the forest-farmer households, the adoption of a new agro-forestry livelihood activity based on 'Perhutani land' did not significantly alter their previous activities. Those owning 'village land' continue to manage this resource as they had before receiving their plot of 'Perhutani land' and most have continued to pursue the non-farm activities they had prior to the distribution, whether they be trading, migrating, harvesting, *baluk* work, or operating a *warung*. However, for some households, new land access also changed their earlier activities. The two households who rely on 'Perhutani land' for their total income were once entirely dependent on harvesting, but they stopped that activity to focus all of their labour inputs on their own land. Several households also gave up migration as it impeded their ability to properly manage their 'Perhutani land'. This is an important issue as it examines not only how the introduction of forest-based activities injects a new income or is simply tacked on to previous activities, but how in the long run the addition of the new activity comes to change the internal dynamic of the livelihood strategy as a whole. As just noted, providing access to 'Perhutani land' can draw livelihood strategies away from external, migration sources back to localized

activities, which in turn could have ripple effects for social and economic aspects of the community.

## 6.7. Tenure and Income Security: Formal Agreements with Perhutani

Clearly, the granting of access to 'Perhutani land' has had a significant impact on the households of Saninten village, providing a significant number with vital 'natural capital' from which they have been able to generate new agro-forestry incomes. Moreover, the value of the land and the incomes generated from it will only grow from the investments made by forest-farmers in seedlings and land improvement. The key to the success and sustainability of this livelihood activity however lies in how it will be mediated by external institutions, specifically the rules and regulations of Perhutani and its PHBM policy.

In other forest-based communities in Indonesia local people have been successful at signing formal agreements with Perhutani outlining the conditions whereby the two parties would jointly manage forest resources. In particular, these rules would dictate how the land is used and how outputs would be shared between the farmers and Perhutani. In terms of rules, all of the respondent forest-farmers understand the basic guidelines of having to space mahogany trees at particular distances, that they must care for these trees for Perhutani and not harvest them, and that they can otherwise inter-cultivate their own crops. However, the farmers' groups (KTHs) do wish to challenge the spacing requirements so that they can more intensively cultivate the land.

As discussed above, the sharing of outputs currently operates under highly informal terms. Most respondents have knowledge of 25% share requirements, but few actually contribute this amount. Rather, contributions tend to be made informally to Perhutani officials at random intervals. The majority of the forest-farmers expect more formal terms of profit-sharing to eventually be determined and enforced, and within that process they of course wish to see the greatest proportion of income flow to themselves. Achieving fair and beneficial terms of profit-sharing will be essential to the income security of these households in the future, and as such it is an area that the potential agreements must focus on.

Opinions regarding tenure security over 'Perhutani land' reveal an interesting dichotomy in the perspectives of the forest-farmers. On the one hand, every forest-farmer confidently expressed that they expect to access and utilize the land for the rest of their lifetime. At the same time, these households also expressed varying levels of concern that perhaps the terms of use will become overly constrained or that Perhutani might some day force them off of the land. This anxiety is particularly high among those that have come to depend highly on 'Perhutani land' for their total income.

For these reasons, all of the forest-farmer households expressed the desire for written contracts or agreements with Perhutani to protect their income and tenure

security.  The process by which this will occur requires a high degree of integration and organization between the many stakeholders.  In particular, the representative bodies of the farmers, the *Kelompok Tani Hutan*, will need to play a major role in advocating for their rights and objectives.  In order to do so, the groups will also need continued support to build their organizational and negotiation capacity.  Fortunately a key NGO, LATIN (*Lembaga Alam Tropika Indonesia*), is committed not only to enhancing this capacity for the forest-farmers' groups but also to the broader goals of community planning.  Clearly the data above has shown that the access to 'natural capital' and resultant agro-forestry incomes provided through the macro-level of Perhutani policy has made a significant impact on the micro-level livelihood strategies of Saninten households, particularly those of the poor and landless.  Ensuring that policy and institutions continue to facilitate and enhance local livelihoods requires an on-going commitment in multi-stakeholder processes to build toward genuine co-management processes and structures that will fully integrate local people in determining and guiding the use of forest resources.