"Smallholder Oil Palm Production Systems in Indonesia: Lessons Learned from the NESP Ophir Project"

Confidential

Idsert Jelsma, Ken Giller and Thomas Fairhurst

Plant Production Systems,
Plant Sciences Group,
Wageningen University, Wageningen
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Affiliations

Idsert Jelsma is a research fellow at Plant Production Systems, Wageningen University, Droevendaalsesteeg 1, 6708 PB Wageningen, The Netherlands. Email ijelsma@gmail.com, Tel. +31 (0)317 485818.

Ken Giller is Professor of Plant Production Systems, Wageningen University, PP, Droevendaalsesteeg 1, 6708 PB Wageningen, The Netherlands. Email ken.giller@wur.nl, Tel. +31 (0)317 485818.

Thomas Fairhurst is a consultant agriculturalist with Tropical Crop Consultants Limited, 26 Oxenturn Road, Wye, Kent TN255BE, UK. Email tfairhurst@tropcropconsult.com, Tel. +44 (0)1233 811873

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Wageningen UR

Address	:	Droevendaalsesteeg 1, 6708 PB Wageningen, The Netherlands
	:	P.O. Box 430, 6700 AK Wageningen, The Netherlands
Tel.	:	+31 317 482141.
Fax	:	+31 317 484892
E-mail	:	ken.giller@wur.nl
Internet	:	www.pps.wur.nl

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List of abbreviations

ADP	Area Development Project
BAPPEDA	*Badan Perencanaan Pembangunan Daerah* (provincial planning office)
BKAK	*Badan Kerjasama Antar Kelompok*, board for inter-farmer group cooperation, a primary cooperative transformed into KUD and current plasma.
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit (Germany Ministry for Foreign Cooperation)
BPD	*Bank Pembangunan Daerah* (Regional Development Bank)
DGE	Directorate of Estates
DISBUN	*Dinas Perkebunan* (Indonesian Tree Crop Extension Service)
DM	Deutsche Mark, pre euro German currency
FELDA	Federal Land Development Authority
FFB	Fresh Fruit Bunch
GOI	Government of Indonesia
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)
IDR	*Rupiah*, Indonesian currency
IPB	Institut Pertanian Bogor, (Agrarian Institute Bogor (Indonesia)
KAN	*Kerapatan Adat Nagari*, (authorities on Minangkabau traditions and culture)
KBPR	Koperasi Bank Perkreditan Rakyat Ophir
KfW	Kreditanstalt für Wiederaufbau (German Development Bank)
KJUB	*Koperasi Jasa Usaha Bersama*, secondary cooperative
KKPA	*Koperasi Kredit Primer Anggota*, Prime Co-operative Credit for Members
KPS	Koperasi Perkebunan Sawit (plasma)
KUD	Koperasi Unit Desa
LSS	Land Settlement Schemes
masl	meters above sea level
NESP	Nucleus Estate Smallholder Participation
NES/PIR	Nucleus Estate Smallholder/Proyek Inti Rakyat
PCC	Provincial Coordinating Committee
PIR-BUN	*Proyek Inti Rakyat – Berbetuan*, PIR program supported by foreign donors
PIR-Trans	*Proyek Inti Rakyat – Transmigrasi*, PIR programme aimed at transmigrants
PTP(N)	Perseroan Terbatas Perkebunan (Nusantra), state owned plantation company
PNG	Papua New Guinea
PNGDB	Papua New Guinea Development Bank
USD	United States Dollar
VOP	Village Oil Palm
ZOPP	Ziel Orientierte Projekt Planung (Goal Oriented Project Planning)

Explanation of terms

Adat	Customary law
Amprah	Computer program used to calculate financial administration smallholders
Arisan	Lottery within kelompok
Bendahara	Treasurer
Bupati	Head of regency
Erfpacht	Long term landuse rights granted by the Dutch colonial government to entrepreneurs.
Desa	Village
Gemeinschaft	Community, refers to collaboration from internal motivation (opposed to Gesellschaft)
Gesellschaft	Company, refers to single purpose functional relations (opposed to Gemeinschaft)
Inti	Nucleus
Kapling	Plot, in Ophir it refers to the 2 ha oil palm plot
Kebun	Garden or plantation, in Ophir it refers to the plantation
Kelompok	Group
Ketua	Leader or head
Nagari	Traditional community system in West Sumatra and lowest government administrative unit
Ninik mamak	Traditional community leaders/ uncles of the clans
Petugas tehnis	Technical manager
Pusako	Communal lands under traditional Minangabau landrightssystem which are intensively used by local community
Rakyat	People, or smallholders
Rapat	Meeting
Ratau	Area outside traditional three Minangkabau kingdoms
Siliah Jariah	Compensations to Minangkabau indigenous people for improvements these people had made on land which is used by others later.
Ulayat	Communal land part of Minangkabau land rights systems which are not intensively used by community.
Yield	Usually in amount of Fresh Fruit Bunches (FFB) in tons ha^{-1}. In order to obtain the amount of litres multiply tons per hectare with the oil extraction rate and multiply this by 1000 (((ton/ha)*X%)*1000).
Wakil	Deputy

1. Introduction

Shell is interested to understand the role smallholders can play to provide sustainable palm oil as feedstock for bio-energy use. Furthermore, Shell also would like to learn how to increase the average palm oil yield per hectare in a sustainable way, thus increasing overall palm oil production without additional land use. Palm oil used for bio-fuels needs to comply with the RSPO principles and criteria for sustainable palm oil production to be eligible for certification at a later stage.

The NESP Ophir project is an 8,000 ha oil palm plantation, with 4,800 ha managed by smallholders and 3,200 managed by the nucleus estate. The nucleus estate runs the milling facility and is mainly supplied by the smallholders and its own plantations. In the context of possible future palm oil activities, Shell requested a study on the Ophir smallholder project, part of the Government of Indonesia's (GOI) Nucleus Estate Smallholder (NES) programme, which provides an opportunity to assess the development of an oil palm smallholder project over a 25 year period since its inception in the early 1980s to the present.

We embarked on this study as it was perceived that a review of this successful project would provide a wide range of insights into what determined the success of this smallholder oil palm project. The objectives of this study were as follows:

A) Characterisation of Ophir smallholder plantations with respect to:

- **Smallholder organisations** (functions in financial management, extension services for farmers, road maintenance, fertilizer procurement and general management);
- **Plantation agronomy** (crop management, input requirements; including analysis of yield variability);
- **Environmental impact**; and
- **Local socio-economic impacts** (including food consumption pattern / food basket; purchasing power and food availability in the local market)

B) Understanding the reasons for success or failure of the smallholder system, considering aspects named above; also understanding of the range of performance within the project.

C) Assessment of sustainability of the systems based on the RSPO criteria. Would the OPHIR smallholders be eligible for certification and if not, what would they need to improve?

D) How can be the success story transferred to other smallholder systems? What would be the key factors needed for this? How can a nucleus estate use the results to replicate the good results for the smallholders they work with?

Oil palm yields are reported in tons ha^{-1} fresh fruit bunches (FFB). Oil yields are calculated by multiplying the fruit bunch yield by the oil extraction rate (%). Thus a yield of 20 t ha^{-1} fruit bunches with oil extraction of 22% gives an oil yield of 4.4 t ha^{-1}.

2. Methods used

2.1 Research techniques

This study included five weeks of data collection in Europe, two months of fieldwork in Indonesia for one researcher (Idsert Jelsma) and two visits to Ophir by the consultant (Thomas Fairhurst), and eight weeks for data analysis and report writing. In order to obtain the requested information the following methods were applied:

- Literature study
- Interviews
- Field observations
- Survey

The literature study mainly focused on project documentation which was written by or for the German development agencies involved in the project. Some additional information was obtained from these development agencies and by contacting a consulting company that performed a broader evaluation of area development in West Pasaman. Much relevant documentation was collected from former GTZ staff during the field visits.

The majority of fieldwork was carried out in West Pasaman and in Padang, West Sumatra. In Padang information was obtained from Friends of the Earth and the Provincial Bureau of Statistics, and contact was established with Andalas University, a major university in West Sumatra. In West Pasaman observations were made and relevant stakeholders interviewed during visits to the Ophir plantation. Field visits also included interviews with former GTZ project leaders in Wuppertal, Germany and Jakarta, Indonesia and NGOs concerned with oil palm developments in Indonesia such as Sawit Watch and HuMa were interviewed in Bogor, Indonesia.

For this research 45 semi structured interviews were conducted. These interviews consisted of group interviews as well as individual interviews depending on the preferences of the interviewees. Several interviewees were interviewed several times and in total around 50 people were interviewed, ranging from former project staff, NGOs, project members and project leaders. Beside these semi structured formal interviews, there were also many casual conversations with people in the area that were afterwards documented. These conversations also provided a wide range of insights.

The survey consisted of 105 questionnaires that were conducted over a four day period by five Andalas University students. In order to obtain a spread of participants from the whole project area a stratified sampling method was applied in which 21 *kelompoks* were selected (20% of all *kelompoks* in the Ophir project). In each *kelompok* five households were randomly selected (20%) by one of the researchers. The questionnaire is included as Annex XV.

2.2 Scope and limitations

Although we attempted to make a thorough appraisal of the project, it must be recognised that the research was done over a period of five months, with two months of fieldwork in Indonesia, and is therefore not exhaustive. During fieldwork there was only limited possibility to visit the field as it was election time which made the political situation rather tense. The authorities in the region are wary about research into oil palm developments as these are sensitive issues and perceived to be a cause of social conflict. For thorough research into complex social relations it is necessary to remain in the field for a prolonged period and become familiar with the local people and develop trust.

A key advantage in this research was that one of the authors (Thomas Fairhurst) had worked in Ophir during the 1990s which created a significant amount of trust amongst Ophir members and leaders and provided access to 'inside' information. Also collaboration with Andalas University staff, in particular with Dr Afrizal, provided necessary assistance in implementing the survey and gave many insights into the social relations in the project area.

3. Structure of the report

This report consists of an overview of the NESP-Ophir smallholder oil palm project and a set of guidelines for smallholder oil palm developments, based on the experiences of this project. The largest section describes the project, based on literature studies and fieldwork. In the last section guidelines will be provided on setting up smallholder oil palm plantations.

We start with a brief history on the development of oil palm in Indonesia and a current state of the Indonesian palm oil industry in Section 4. This is followed by a brief overview of the different models of smallholder programs in Indonesia in Section 5. These sections illustrate the context in which the project was implemented and provide some background to where concepts in Ophir find their roots.

Section 6 provides an overview of the project location including information on local climate, soils, and topography and a short description of previous land use

In Section 7 we provide information on previous development activities in the direct vicinity of the project, and the goals of the project are highlighted and Sections 8 and 9 and an indication of the institutions involved, what phases and trainings were implemented and what the costs of the project were.

The structure of the smallholder organisation and the strengths associated with this system are described in Section 10. This section provides an overview of the whole smallholder organisational structure and the responsibilities within the organisation. Information on plantation services are covered and include issues as crop transport, fertilizer procurement and distribution, pest and disease control, and labour arrangements. This section highlights the current situation in Ophir and how it functions, and thereby is the core of our research.

Section 11 provides the results of the project and highlights the remarkable productivity achieved by the smallholders and information about their credit repayment. Section 11 also includes information on environmental and socio-economic impact that the project had on the region. These local socio-economic aspects include food security and job creation. We also include a comparison between the participatory Ophir smallholder organisational structure and other smallholder oil palm developments in the area. This section concludes with findings concerning the difficulties encountered in transferring knowledge from the NESP-Ophir to other projects.

The level of compliance with RSPO criteria is dealt with in Section 12. Although the project is still operational and has proved to be successful, the project does face significant challenges which are noted and discussed in Section 13.

Section 14 provides conclusions on the Ophir project and highlights the lessons learned. The conclusions are followed by a set of guidelines in Section 15 on how to set up smallholder palm plantations based on lessons learned in Ophir.

This document contains several Annexes that provide the reader with more details on particular topics and are referred to in the text. Annex II provides a concise overview of key factors contributing to the success and sustainability of NESP Ophir project and a visual overview of the project is provided in Annex XVI.

4. Oil palm development in Indonesia

Oil palm was introduced to Indonesia in 1848 when four palms were established in the botanical gardens in Bogor. In the 1850s trial plantings were established all over Indonesia and soon after a report appeared on the cultivation of oil palm for the production of soap and candles in Muara Inem in Southern Sumatra (Bickmore 1869). The first commercial plantation was developed in Sumatra, Indonesia in 1911 and the area planted in Indonesia increased to about 31,600 ha by 1925 and to 92,000 ha by World War II (Corley and Tinker 2003). Most oil palm development took place in North Sumatra where Dutch entrepreneurs gained access to large tracks of highly suitable land and developed oil palm estates.

Many of these oil palm estates were abandoned during Japanese occupation and the subsequent struggle for independence in Indonesia. Foreign investment in estate agriculture was not encouraged during the Soekarno régime, during which time the State's limited resources were used to promote agricultural development (mainly lowland rice production for food security) on Java with little attention given to the development of Indonesia's so-called 'outer islands' (Casson 2000; Zen, Barlow et al. 2005). The oil palm industry stagnated until the late 1970s when a period of exponential growth began that has continued until the present (Figure 1).

With the start of the New Order in 1967, Soekarno's 'Java centralism' policy was abandoned and more attention was given to regional development in the outer islands. The New Order régime, supported by the World Bank and the Asian Development Bank, capitalized on comparative advantages for the development of oil palm cultivation in Indonesia including the availability of labour and suitable land with favourable climatic conditions coupled with growing domestic and international markets for edible oils due to population growth and increasing per capita incomes, particularly in China, India and Pakistan (Casson 2000).

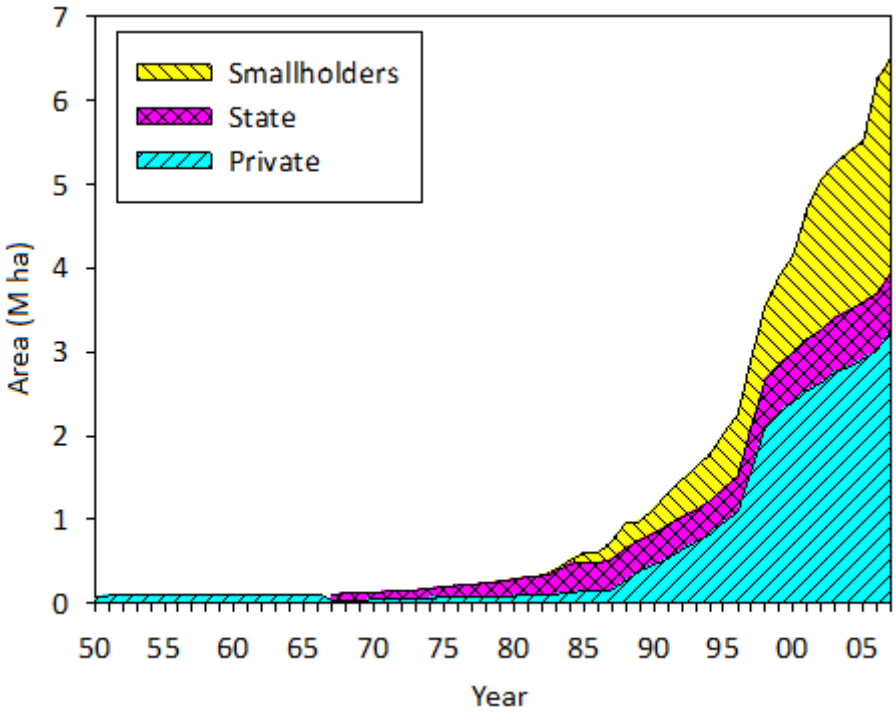

Figure 1 Area planted to oil palm by smallholders, state owned plantations and private sector plantations in Indonesia, 1950-2007 (Badan Pusat Statistik 2008).

The New Order régime created state owned plantation companies, or *Perseroan Terbatas Perkebunan's* (PTP's) that focused on the cultivation of export crops such as coffee, coconut, rubber and oil palm. These companies were usually established on excellent agricultural land, previously developed by Dutch planters, that was nationalized after Indonesia gained independence. By the mid 1980s and after a period of further expansion almost 70% of the area planted was managed by

PTP's. During the period 1988-1994 the Government of Indonesia (GOI) supported the private sector in the development of PIR–Trans projects. Since then, oil palm development has been driven by private sector investment and private companies have been required to allocate part of concessions for smallholder developments, known as KKPA.

Thus, expansion of the oil palm industry can be grouped into five phases:

- <1942 – expansion by Dutch planters.
- 1942-1968 – period of stagnation in oil palm development.
- 1968-1988 – expansion from government investments via PTPs and including NES/PIR-BUN[1] projects.
- 1988-1994 – joint government-private sector investments known as PIR-Trans, providing land and jobs for transmigrants.
- 1994-present – government supported private sector and cooperative investment known as KKPA (*Koperasi Kredit Primer Anggota*, Prime Co-operative Credit for Members).

Oil palm development in the 1990s has been referred to as a 'hesitant boom' because of the impact economic crisis and political change on industry development (Casson 2000) but, on the other hand, the palm oil sector was one of the few industries that suffered relatively little from the economic crisis in the 1990s (Susila 2004). This may be explained by the fact that palm oil is traded in US dollars whilst many oil palm developments at the time of the crisis were financed in local currency and the value of loans in real terms was greatly reduced following the massive devaluation of the Indonesian Rupiah in 1997/1998. Expansion was most rapid *after* the monetary crisis of 1997, when the total area more than doubled in 10 years from 2.9 M ha in 1997 to 6.5 M ha in 2007.

In 2006, Indonesia produced about 16.5 million tons of palm oil, of which 11.9 M t was exported and, for the second successive year, Indonesia surpassed Malaysia as the largest palm oil producer in the world (Figure 2). Palm oil exports presently provides an export income of almost USD 8 billion equivalent to about 15% of the value of Indonesia's exports (Badan Pusat Statistik 2008; CIA 2009).

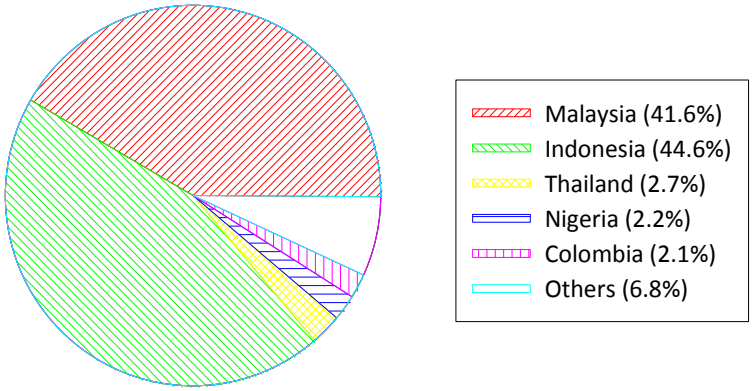

Figure 2 Production of crude palm oil by country (Badan Pusat Statistik 2008)

With 40% of the planted area, smallholders represent a very important and, as yet, still neglected part of Indonesia's oil palm production base. With improvements to organisational and technical aspects of plantation management there is tremendous scope to improve productivity, export earnings and, the livelihoods of the 1.25 M smallholder farmers and their 6.4 M dependents that represent about 3% of the population of Indonesia.

[1] Nucleus Estate Smallholder/Proyek Inti Rakyat. BUN stands for 'Berbetuan' and indicates the program was supported by foreign donors

5. Some characteristics of oil palm and their effect on smallholder development in Indonesia

Unlike coffee, cocoa and rubber, where crop processing can be carried out efficiently by independent smallholders using small-scale post harvest technologies, fruit bunches produced by oil palms grown for the production of standard crude palm oil must be processed promptly after harvest in large scale processing plants or mills[2]. This explains why, until quite recently, smallholder oil palm development took place mainly in so-called nucleus estate-smallholder schemes, where the company develops oil palm plantings on a land concession, part of which is subsequently managed as estates (nucleus) and part is sold to farmers under credit schemes sponsored by the government. Typically, the nucleus estate and associated processing factory is sufficiently large to justify professional management. The farmers (often referred to as the plasma) are then under contract to sell their produce to the nucleus estate under monopsonistic market conditions. Nucleus estate/out grower projects have been implemented in the Caribbean and Latin America, Africa, South East Asia and the Pacific islands for sugarcane schemes as well as tree crops such as oil palm, coconut, rubber, tea, cocoa, coffee and bananas (Goldthorpe 1987).

In the conventional approach to implementing nucleus estate/smallholder schemes the nucleus estate guarantees to supply processing for out grower crop but the out growers are subject to close supervision in their husbandry practices. This ensures the raw crop is produced in sufficient quantities and of adequate quality for the processing mill to export a high quality product and recover the investment costs of installing a processing plant with sufficient capacity to process both nucleus estate and smallholder crop.

The nucleus estate management sets standards for crop management in their own estates and provide agronomic, management and commercial services (loan payment recovery) to farmers growing the same crop as the plantation. The smallholders provide a focal point for further out grower development, and the smallholder development carries only sufficient staff to provide services not provided by the nucleus estate.

The nucleus estate provides the following (Goldthorpe 1987):

- Physical and social infrastructure such as roads, housing, market centres, schools and medical facilities;
- Management of nurseries high quality planting material for the plantation's own use and for the out grower farmers;
- Forest clearing, and block planting of the perennial crop and maintenance to maturity, before handing each area over to the smallholders to be operated either as individual holdings or as a communally-owned (co-operative) estate;
- Continuing inspection and advisory services;
- Training of farmers;
- Collection, processing and marketing of produce;
- Bulk buying, storage and sale to farmers of material such as fertilizers and pesticides; and
- Supply of credit and loan repayment facilities.

The Nucleus Estate Smallholder/*Perusahaan Inti Rakyat* (NES/*PIR*) schemes introduced in the 1980s were based on or influenced by earlier successful smallholder programmes in Malaysia (FELDA) (Lim and Dorall 1992) and Papua New Guinea (Land Settlement Schemes, or LSS) (Koczberski, Curry et al. 2001) (Annex III). The first FELDA scheme was set up in the 1960s by the Malaysian government to

[2] Smallholders in Africa still process fruit bunches in using simple technology but the oil has very high free fatty acid (FFA) content and is not traded on world markets.

provide opportunities for poor farmers and, during the early years, former communist insurgents and to contribute to export incomes and national development, and proved to be quite successful (Zen, Barlow et al. 2005). Oil palm LSSs were initiated in Papua New Guinea in the 1960s as part of an effort to reduce land pressure in the highlands and increase export earnings (Harries and Benjamin 1991).

As we shall see, the NESP/PIR-BUN Ophir project challenged many of the standard assumptions for nucleus estate smallholder project development by emphasizing principles of participatory development where the farmers are the subject and not the object of development initiatives. From the outset one of the goals of the project was to explore how far farmers could become a viable, progressive, and self reliant farming community.

As the number of palm oil mills has increased, a competitive market for smallholder produce has developed and many smallholders now sell their produce to the mill offering the highest price even though they may be under a legal obligation to sell to the nucleus estate in the scheme to which they are attached at the outset. Until today, farmers generally lack the capital and technical expertise required to recapitalize the low fertility status soils in degraded land where there are opportunities for oil palm development that meet the guidelines of RSPO (RSPO 2007).

6. The location of the Ophir project

6.1 Geography

The Ophir project (0° 1.66'N, 99° 51.64'E) is located in the District of West Pasaman (0° 30'-0° 11' N, 99° 10'-100° 04' E) in the Province of West Sumatra, Indonesia. The topography in the project area is characterized by flat lowlands in the western part to gradually more hilly and dissected terraces at higher elevations in the East (Table 1). Altitudes in the project site vary from 60 masl in the western part to 400 masl in the eastern part of the plantation.

Table 1 Area planted, altitude and topography of plasmas in NESP Ophir (BMZ 1992; Fairhurst 1992; KfW 2000).

Plasma	Area (ha)	Altitude	Topography	Planted[3]
1, 2, 3	2,430	25-100	Flat	1982/83
3, 4, 5	1,430	100-200	Flat/undulating	1984/90
4	940	200-425	Undulating-steep	1985/92
Ophir	4,800	25-425		1982/92

6.2 Climate

Climatic conditions in the project area are extremely favourable for palm oil. The mean minimum monthly rainfall is greater than 150 mm and total rainfall ranges from 3,000 in the West to 5,000 mm year^{-1} in the foothills of Gunung Talamau on the East side of the project (Figure 3; for map see Annex I). There was concern in an early site appraisal that solar radiation would be sub-optimal because of excessive cloud cover associated with high rainfall (Rosenquist and Anderson 1975) but in reality, rainfall occurs mostly in late afternoon and evening so there is relatively little day time cloud cover (Fairhurst 1992).

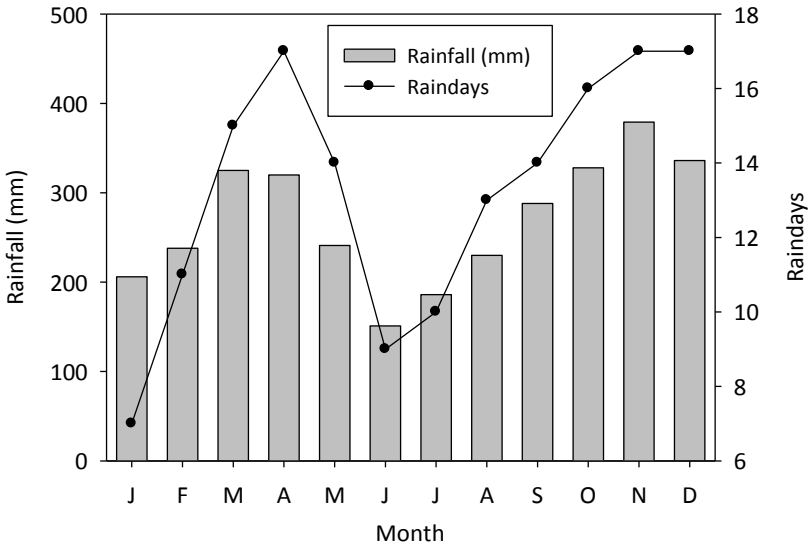

Figure 3 Mean monthly rainfall and number of raindays in NESP Ophir (after Purba and Lubis 1993)

Day time temperatures vary from 26°C to 38°C with a mean of about 31 °C and night time temperatures vary from 19°C to 24°C. Temperatures are slightly lower at higher elevations in the East side of the project. The project area is not affected by strong winds and there has been no significant wind damage to the oil palm plantings since the start of the project.

[3] Including significant replanting because of poor quality first plantings.

6.3 Soils

The soils in the project area were derived from basic volcanic ash from eruptions from Mount Talamau in the Holocene period. Under the revised Keys to Soil Taxonomy (USDA 2003), the Ophir soils come under the order Andisols and the great group Melanudands, reflecting their dark or **mel**anic surface horizon, the lack of seasonality in rainfall or **ud**ic moisture regime, and the presence of **and**ic properties. At lower altitudes the soil is formed almost exclusively from volcanic ash whilst in some of the upper reaches of the project basaltic boulders can be seen at the surface and in the soil profile.

A comprehensive soil survey was carried out by the Dutch over the entire project district to investigate the suitability of the area for oil palm cultivation (Sieverts 1938). The survey report remarked on the soil's large organic matter content but small exchangeable K concentration. Although the amount of available P in soil was small, serious P deficiency was considered unlikely since the soil physical properties favoured extensive root development.

Soil analysis was also carried out in 1975 as part of the feasibility study of the present project (Rosenquist and Anderson 1975) and a summary of the results is presented in Table 2.

Table 2 Soil chemical properties in the Ophir plantation site measured in 1975 (Rosenquist and Anderson 1975)

Depth	pH	C	N	C/N	P Bray	K	Na	Ca	Mg
Cm	-	%		-	mg kg^{-1}		cmol kg^{-1}		
0-20	5.7	7.90	0.69	11.4	7.7	0.48	0.07	2.24	0.55
20-40	5.8	4.56	0.43	10.6	7.9	0.34	0.07	1.15	0.18
40-60	6.0	1.91	0.19	10.0	9.3	0.25	0.08	1.08	0.15

These analyses confirmed the earlier assessment that the amount of soil available P was small but indicated that there was a large concentration of exchangeable K. The soils have excellent physical structure such that they drain well and allow excellent root development. Whilst the lower elevations of the project site provide almost perfect conditions for oil palm, the dissected terraces at higher elevations on the East side of the project are less favourable due to steep topography along creeks and rivers that flow east to west from the Gunung Talamau, higher rainfall (≤5,000 mm $year^{-1}$) and higher altitude (≤425 masl).

6.4 Site suitability

Yield potential varies along an East-West gradient with a larger yield potential on the flat, fine textured soils with lower rainfall and less cloud cover in the West to smaller yield potential in the undulating to hilly, coarser textured soils with high rainfall in the East. Overall, the Ophir site is well suited to oil palm cultivation and, with current planting material, has a very high yield potential of 30-35 t ha^{-1} fruit bunches or 7-8 t crude palm oil ha^{-1}.

6.5 History of land use

At the turn of the last Century the Ophir area was sparsely populated and relatively undeveloped. In 1914 the first '*erfpacht*[4] 'agreement between Dutch entrepreneurs and the local population was signed and the first plan was to establish a 2,100 ha coffee plantation. In 1933 the NV Cultuurmaatschappij found the location to be very favourable for oil palm after establishing a 2 ha

[4] Legal agreement for land use by a commercial enterprise used during the colonial era. *Erfpacht* agreements provided the user with a 75 year land lease after which the lease is either extended or the land is returned to the local community (Afrizal, M. (2007). The Nagari Community, Business and the State: The origin and Process of Contemporary Agrarian Protests in West Sumatra. Bogor & Morton-in-Marsh, Sawit Watch - Forest Peoples Programme.

trial plot. In 1937 the area was extended to 4,750 ha, with a new *erfpacht* agreement, and a palm oil mill was constructed. Labourers for the plantation were brought in from Java, worked as '*koelies*' in the plantation and resided in villages Sidomulyo, Bandar Rejo and Pujarahayo (see map in Annex I). Subsequently some of these labourers became Ophir farmers.

By 1941, a mill was operating and the oil palm plantings were in production but all land titles were transferred to the NV Koloniale Bank (later the NV Cultuur Bank) in Surabaya. During the war the plantation was neglected and milling facilities dismantled and destroyed. In 1955 the company's assets were sold to the Ministry of Defence who attempted unsuccessfully to convert the area into a smallholder project for retired military personnel. Most of the Javanese labourers stayed on and started cultivating other crops in the plantation but were later regarded as illegal squatters.

7. Project goals

7.1 Area development in West Pasaman and the NESP Ophir project

In the 1970's West Pasaman was considered the most backward and isolated sub-district in West Sumatra, but its fertile soils and favourable climate made the area suitable for a major regional development effort. In 1975, as part of the Agricultural Development Project (a collaboration between the German Government and GOI from 1968-1979) consultants investigated land in West Pasaman and found it very suitable for oil palm development (Rosenquist and Anderson 1975) but no further development took place. In 1980 the KfW reinvestigated the site and, in collaboration with the local military and Indonesian authorities, plans were made to create a PIR-BUN project at the location.

After the successful Agricultural Development Project from 1968-1979, BMZ (representing the German government) and the Government of Indonesia set up an integrated rural development programme that included three elements:

- Oil Palm Plantation Project (NESP-Ophir) financed under a loan by KfW and a grant from GTZ;
- A new Area Development Project (1980-1992) financed by GTZ;
- Access Road Project in West Pasaman financed by a loan from KfW.

These three projects complemented each other:

- The road project provided the necessary infrastructure for the oil palm plantation and access to markets;
- The oil palm project provided employment opportunities and generated income; and
- The Area Development Project supported rural development in the area surrounding the Ophir project, especially the banking sector.

Several institutions were involved in the NESP-Ophir project and each had particular goals. We first review general goals of the NES/PIR projects and the NESP Ophir project in particular and then introduce the main institutions involved in the development of the project. The original project documents stated the main goal of financial cooperation (involving KfW) and technical cooperation (involving GTZ) as *'Increasing farmers' incomes, and the production of oil palm products'* (BMZ 1992).

7.2 General goals of NES/PIR projects

The main objectives of the NES/PIR projects were:

- Development of remote rural areas;
- Provide livelihood opportunities in rural areas;
- Increase and diversification of foreign exchange earnings;
- Employment opportunities in rural areas and thereby mitigate rural-urban drift;
- Reduction of income disparities;
- Promotion of individual land ownership.

The Ophir project was set up as a NES/PIR-BUN indicating the contribution of foreign donor funds. Although Zen *et al.* (2005) comment that the NES/PIR oil palm projects set up with the PTPs were eventually quite successful, by the mid 1980s it was widely recognized that many NES/PIR projects had failed or underperformed due to poor management, insufficient finance, lack of capacity and motivation by the PTPs, and lack of concern for farmer interests resulting in decreased commitment by participating farmers (BMZ 1992; GTZ 1995a; World Bank 2009).

7.3 Specific goals of Ophir NESP/PIR project

The German partners in the Ophir project acknowledged lack of active involvement of the smallholders in self determination as a major shortcoming in many PIR/BUN projects and therefore insisted on including a **participatory (**NES**P** as opposed to NES**)** element in the programme (BMZ 1992; Heering 1993). By involving farmers in the organisational structures and giving them responsibility in the organisation the German donors envisaged increased commitment and more effective management by the participating smallholders.

This so-called 'participatory' approach remained a controversial point in Indonesia during the 1980s and whilst it was generally accepted as part of the bilateral development cooperation between the German and Indonesian governments, the Directorate General of Estates (DGE) and PTPN VI challenged continuously the idea that farmers would be capable of organizing the smallholder plantation. Two GTZ advisors that worked for several years in the Ophir project indicated that most officials in the GOI at that time were very sceptical of attempts to educate and integrate farmers in the management of the smallholder plantation (Klaus Dieter Peters and Rudolf Heering-Just, pers. comm.).

However, developing self-help capacity of farmers was an important tenet in German development policy at that time and whilst the participation of farmers was stated in documents as one of the goals of the project, the way in which this was to be implemented was not explicitly stated. The struggle concerning how far farmers could be made responsible for their own organisation was a serious threat to the continued involvement of the German donors in the project and led to frequent clashes at a highlevel between the German and Indonesian government representatives.

8. Institutions involved

8.1 Germany Ministry for Foreign Cooperation (Bundesministerium für wirtschaftliche Zusammenarbeit, BMZ)

The BMZ was the main counterpart with the Indonesian government in the Ophir project, held regular meetings with the GOI and carried out several evaluations. The BMZ commissioned the German Development Bank (Kreditanstalt für Wiederaufbau, KfW) and German Technical Cooperation (Deutsche Gesellschaft für Technische Zusammenarbeit, GTZ) to carry out respectively the financial and technical cooperation elements of the project.

8.2 German Development Bank (Kreditanstalt für Wiederaufbau, KfW)

KfW was responsible for financing the project under a loan but also supervised the activities implemented by PTP VI and the Indonesian Government including:

- Plantation development;
- Oil palm processing mill construction;
- Project road infrastructure development;
- Construction of smallholder houses;
- Development of the West Pasaman Connecting Road; and
- Supervision of the construction of the Teluk Bayur harbour.

8.3 German Technical Cooperation (Deutsche Gesellschaft für Technische Zusammenarbeit, GTZ)

GTZ was responsible for the implementation of the technical cooperation component, or institutional development of the project, in particular for developing suitable human resources and social capital to run the Ophir smallholder plantation effectively. This also included funds for administration, training centres, supply of transportation and heavy equipment for road maintenance.

At the same time the NESP/PIR-BUN Ophir project was underway, GTZ was also implementing a large Area Development Project in West Pasaman that provided complementary development initiatives in the areas surrounding the Ophir project were, as we shall see, there was to be a significant increase in the demand for goods and services by Ophir farmers as their incomes from oil palm increased. The ADP and Ophir project shared the same team leader and cooperation between the two projects was actively encouraged and fostered.

8.4 Provincial Coordinating Committee (PCC)

The PCC was created by a decree issued by the Governor of West Sumatra where all 22 relevant government institutions involved in the project were provided with a platform for debate and regular meetings to discuss project development and the respective institutions could be held accountable for their activities. The PCC proved to play a critical role in the successful development of the Ophir project, partly due to the personal commitment shown in particular by leaders in the regional planning board (BAPPEDA) who allowed space for GTZ to work towards self-reliant farmers (BMZ 1992; Heering 1993; BMZ 2004).

The PCC was the organisational structure that provided GTZ with the platform to design and implement a farmers' organisational set up with democratic features that were ahead of their time in pre-*reformasi* Indonesia.

8.5 Indonesian state owned plantation company (PTPN VI)

In the 1980s, state owned plantation companies (PTPs, now known as PTPNs), under the aegis of the Directorate General of Estates (DGE) and the Tim Khusus department within the DGE, were chosen to establish new estates and, on the Government's behalf, to manage and develop associated smallholdings in NES/PIR projects. The estate companies received funds to clear land, establish and maintain the tree crops up to maturity (when the land was divided into individual plots and allocated to smallholders), build infrastructure and housing for settlers, and market produce. Some participants were first employed as workers for the period of plantation development (planting to three years after planting) after which, if they were assessed as suitable, they were allocated a smallholding (BMZ 1992; World Bank 2009).

PTP VI (now PTPN VI) was responsible for the implementation of the NESP/PIR-BUN Ophir project. KfW funds were channelled to PTP VI for the development of the mill, plantation and farmers' houses and GTZ worked with PTP VI in the setting up of institutional arrangements for the farmers' organisation.

8.6 Indonesian Tree Crop Extension Service (Dinas Perkebunan, Disbun)

Dinas Perkebunan (Disbun), falls under the Indonesian Ministry of Agriculture and provided extension advice to farmers on the cultivation of oil palm. Initially, about 40 Disbun officers served in the project and this gradually decreased to five in 1992.

8.7 Regional Development Bank (Bank Pembangunan Daerah, BPD) and Ophir Bank

BPD, which is owned by the local authorities, was the local executing bank for the Exim Bank, the project bank, which did not have a branch in West Pasaman. All farmers were provided with a bank account at the BPD and payments by PTPN VI were made through BPD. By making payments through the banking system, farmers were compelled to make credit repayments on time and according to contract and farmers gained experience with the banking system. Each farmer's land certificate was lodged with BPD as collateral until the respective smallholder's loan was repaid.

The KJUB set up the Ophir Bank in 1995 to take advantage of the possibility provided by the smallholder's oil palm business to engage in other banking activities. Also the Ophir bank took over the payments by PTPN VI to the smallholders.

8.8 Target group

The 2,400 smallholders were selected from local farmers (some of whom were already cultivating land within the concession that was developed into the Ophir project), army veterans, civil servant pensioners, and former PTP VI employees (Table 3). Army veterans were a relatively large group in Plasma 1 and 4 whilst PTP VI employees were well represented in Plasma 5 (Table 3). According to former GTZ staff local Minangkabau represented a large portion of smallholders in Plasma 3.

Table 3 Occupational background smallholders (Heering 1993)

	Plasma 1		**Plasma 2**		**Plasma 3**		**Plasma 4**		**Plasma 5**		**Total**	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Veterans	210	38	217	58	103	21	320	48	0	0	850	35
Ex-civil servants	1	<1	3	<1	12	2	50	7	36	12	102	4
Ag. background	339	62	155	41	385	77	227	34	172	56	1,278	53
Ex-PTP VI	0	0	0	0	0	0	72	11	98	32	170	7
Total	550		375		500		669		306		2,400	100

The official farmer selection criteria were as follows (Bauer 1991; Heering 1993):

- Married;
- Owns less than 1 ha;
- Able to manage the plantation with own labour;
- Willing to live on the plantation; and
- Willing to become a member of the farmer's organisation.

At first it was quite difficult to attract local farmers into the project, particularly those with experience of working for the previous Dutch-owned plantation. Farmers feared becoming locked into an oil palm plantation scheme and preferred instead to farm abundant land available outside the project area. For example, rice farmers in Desa Pujorahayu, Desa Sidomulyo and Desa Bandar Rejo areas located in the centre of the project (Annex I) refused to join the scheme and have continued to cultivate lowland rice (and sell their produce to the Ophir farmers). Over the last ten years, however, many farmers in these villages have established oil palms within their existing farming system to add to and diversify their farm incomes.

Since the land was formerly in possession of the military, the project agreement required that at least 35% of farmers be selected from armed forces veterans, and some smallholdings were allocated to former civil servants, PTP VI staff and Disbun officers. Whilst some of the farmers from these groups did not fulfil all the selection criteria (Bergschneider 1990) they provided important skills and experience that contributed directly to the success of the project. Thus, the farmers' organisation could make use of settlers with experience in administration (ex-civil servants), disciplined working procedures (army veterans), plantation agriculture (PTP VI) and extension services (Disbun).

By contrast, other NES/PIR projects became ghettos of rural poor without the skills and experience to set up and run a viable farmers' organisation. It can be argued that whilst there was less direct participation in the Ophir project from local farmers, the spin-off effects of the project on the local community was greater in the Ophir project because of the contribution of skilled participants to the overall success of the project and the impact of its 'buying power' on the local community in the surrounding area. Some might go further and argue that the development of a complex farmers' organisational set up required the skills and experience provided by the army veterans, civil servants, PTP VI staff and former extension workers and would not have been possible if all settlers had been drawn from the community of poor landless farmers.

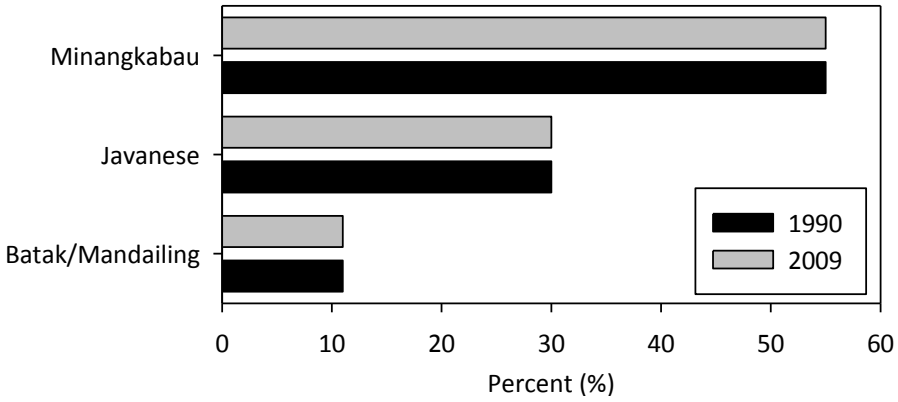

Figure 4 Ethnic background of farmers in the NES/PIR-BUN Ophir Project (Bergschneider 1990 and own data).

As it became evident that farmers prospered after they joined the Ophir project there was much more interest from local farmers to join the scheme. Under the pressure of large numbers of applicants, however, the selection criteria were not applied as strictly in Plasma 3-5 as they were in the Plasma 1-2. This was partially influenced by accusations towards GTZ by Indonesian officials that

some GTZ staff were communist sympathisers. This weakened the position of some GTZ project staff and strengthened the position of local politicians who were then able to influence the selection of participants.

The wide diversity of farmers' ethnic backgrounds was considered an advantage by project management (Figure 4). Instead of the conflicts between different ethnic groups that occurred in some other projects, particular attributes of different groups were channelled towards overall project success (Heering 1993) and *'…the Bataks were the pushers of activities, the Javanese the diligent workers (kg ha^{-1}) and the Minangkabau the traders (USD t^{-1})…'(GTZ 1995b)*. This diversity of backgrounds is still evident, indicating that no ethnic group either joined or left the project since inception.

9. Project implementation

9.1 Cost of project development

BMZ (BMZ 1992) provides a clear overview of the costs incurred by GOI and the German Government up to 1992 (Table 4 and Annex V). The KfW component (about USD 14.7 M) was provided as a loan, whilst the GTZ component of the project (USD 6.6 M) was provided as a grant; the GOI contribution was about USD 18 M. The total cost till 1992 was estimated at USD 39.2 M.

Table 4 Summary of project costs till 1992 (BMZ 1992)

	Source of finances	Components	USD M	USD ha^{-1}	%
Infrastructure	KfW, GOI	Mill, harbour, offices	16.4	2,036	42
Roads and houses	KfW, GOI	Settler houses, roads	5.0	620	13
Plantation	KfW, GOI	8,056 ha plantation	10.8	1,341	28
Training	GTZ, GOI	Farmers organisation	7.0	869	18
Total			39.2	4,865	100

In the post project support phase, from 1993 till 1996 (see Section 9.2) GTZ costs were estimated at USD 1.2 M (Peters 1992; GTZ 1995b) and GOI cost estimated at USD 1.3 M (GTZ 1995b). These costs were mainly incurred for the spread of knowledge to other projects and not for the development of the NESP Ophir project itself.

The NESP/PIR-BUN Ophir project was rated as the most successful project component of the integrated regional development project in West Pasaman (BMZ 2004) with an internal rate of return of about 12% at project completion. More information on investment costs is provided in Annex V.

9.2 Phases of development

9.2.1 Plantation and infrastructure development

The financial cooperation component, funded by KfW, began in 1981 with the construction of plantation roads, the mill and port facilities, and land clearing and plantation development by PTP VI.

Activities were scheduled to be completed by 1987 but there were delays due to inadequate funding by GOI to PTP VI, lengthy approval procedures for tendering and contracting divisions, persistent disagreement over the final participants, necessary standards of infrastructure and the poor qualifications of individual contractors KfW activities were completed in 1992.

There were considerable delays with the development of Plasma 4 mainly due to the difficult terrain (dissected terraces separated by steep gulleys) and inadequate investment in infrastructure prior to plantation development. The area bordered on forested land to the East and there was much damage to palms by wild pigs and porcupines that necessitated high rates of supply planting. Since the road system was not installed it was almost impossible to carry out the necessary work. Thus, from the beginning, the quality in Plasma 4 was compromised and this helps to explain the lower potential and actual yield in this area. The important lesson is that the high standards of plantation development required to set a high yield potential for the 25 year lifespan of the palms can only be achieved if adequate infrastructure is established.

9.2.2 GTZ role in farmers' organisation development

The technical cooperation component for building up of the farmers' capacity for plantation management and self reliant farmer organisations was a process-oriented path that developed and

evolved steadily in line with the project goals. Although the project could draw on experience with smallholder development in the FELDA scheme in Malaysia (Annex III), there was little other experience available on how to set up a self-reliant farmers' organisation for an oil palm smallholder project that met with the requirements of the cooperative structure then applied in Indonesia.

Technical cooperation component, implemented by GTZ, started in 1982 and continued until 1996 (Table 5). A final three year post project support phase was included in which GTZ contributed experts with a focus on reducing GTZ's involvement in Ophir, building up capacity of counterpart organisations and focusing on the spread of the Ophir concept in other NES/PIR programmes in West Sumatra. Workshops were held to disseminate the results, lessons and experiences at Ophir to GOI staff, nucleus staff and farmers of other NES/ PIR projects with oil palm, rubber and tea plantations in West Sumatra (GTZ 1995a; GTZ 1995b). More information on activities in the different phases is provided in Annex VIII.

Table 5 Phases in project and GTZ contribution (Peters 1992; Heering 1993), (pers. comm. Peeters, 17-06-2009)

Phase	Years	Activities	Man months			
			Sociologist	Economist	Agronomist	Total
1	82-84	Building of farmer groups	21	21	-	42
2	84-86	Building primary cooperatives	33	29	-	62
3	87-90	Creation management structures	39	39	12	90
4	90-93	Building structures for sustainability	36	24	18	78
5	93-96	Post project support phase	18	18	12	48
Total	82-96		147	131	42	320

9.2.3 Training provided by GTZ, Disbun and specialist NGOs

Farmer training was a major component of the project input from GTZ and Disbun and NGOs were trained and contracted by GTZ to carry out the work. Three main issues were addressed:

- *Group dynamics*: the rights and responsibilities of farmers in the Ophir organisations and procedures for decision making.
- *Technical know-how*: harvesting and upkeep of the plantation.
- *Management skills*: book keeping, administrative and other organisational skills needed to manage the smallholder organisations.

A stepwise approach was taken to capacity building within the project. At first the focus was on the basic unit of the Ophir system, the farmer groups or *kelompok*. Clear guidelines were set up to avoid misunderstanding and confusion about rights and responsibilities (Bauer 1991). Once farmer groups were functioning well attention was given to building up the BKAK and related organisational structures. The final step was to organize the umbrella organisation to coordinate activities between each cooperative and with the PTP VI.

Training was performed by GTZ, and experts hired from institutes (e.g., Institute Pertanian Bogor (IPB), Indonesian Oil Palm Research Institute). Officially and in accordance with GTZ guidelines, training was performed with the Goal Orientation Participation Process (ZOPP) methodology. In practice training events took place in collaboration with farmers and experts who exchanged knowledge as it developed. Training was generally carried out in the field or plasma village training centre; close to the problems farmers encountered in the project. There were no financial or material incentives provided to farmers to join the training sessions and farmers joined from their own interest as they realized there was something to learn for them.

Disbun provided technical training to all farmers based on a farmer's oil palm manual that was prepared by PTP VI, Disbun and GTZ (Fairhurst 1990). This contributed to developing a pool of trained farmers qualified to provide extension services from the farmers' organisation.

The roll out of organisational structures, procedures, and plantation management techniques proceeded from Plasma 1 to the other cooperatives as they were settled by farmers and Plasma 1 set the standard for the whole project. It can be concluded that training proved to be sufficient to provide smallholders with technical knowhow and to get acquainted with the self-help management concept. For more detailed information on the training programme see Annex XII.

10. Characterization of the Ophir smallholder plantation

What makes plantation agriculture distinctive? Agricultural geographers tend to focus on size of operations (workforce and area cultivated) requirement for capital inputs, and crop specialization but perhaps the most perceptive analysis is provided by Goldthorpe (1987) who highlighted several important generic features of plantation systems that include:

- A well defined, formal organisational structure with high concentration of authority and structuring of work activities;
- Strict hierarchy of management control;
- Standardization of production methods in written planting manuals that describe each agricultural operation;
- High degree of specialization of the workforce;
- Continuity and planned repetition in the performance of well-defined and skilled tasks at the correct time;
- Consistent treatment to the sequence of agricultural operations through a planned work programme;
- Regular visits by agricultural inspectors to ensure that common field standards are maintained; and
- Accounting staff check implementation of financial procedures.

As we shall see, many of these features were incorporated in the farmers organisation established in NESP/PIR-BUN Ophir.

Aside from the logic of technically oriented and efficient plantation management there was also a goal of social strengthening. Many of the settlers were new to the area and the development agency had the desire to create a successful community with a spirit of '*gemeinschaft*' or a sense of 'togetherness' (GTZ 1988; Heering 1993). During our visit, we met many smallholders that underlined 'togetherness' as a core value of the project which after 27 years is still evident.

Instead of using the largely unsuccessful government village cooperative unit scheme (*Koperasi Unit Desa* or KUD) mandated by the GOI, the project aimed to establish a self-reliant farmers' organisation. At times the GTZ walked a tightrope between promoting an independent farmers' organisation aimed at self-reliance with the need to comply with Indonesian laws governing forms of organisation.

10.1 Farmers organisation

The Ophir farmers' organisation is a major contributory factor to the high yields that have been achieved and sustained over 27 years since farmers began to harvest their plots. Each farmer belongs to a farmer group of about 25 members and 50 ha of oil palm plots. Groups are organized in primary cooperatives each of 600-1,200 ha and the five secondary cooperatives are brought together under a secondary cooperative (Figure 5).

Bauer (1991) and former GTZ coordinators (pers. comm., Heering and Peeters) indicate that farmers were involved in the process of designing organisational structures and this increased the farmers' commitment and sense of ownership of the project from the outset.

In the BMZ's Ex-post evaluation of the whole Area Development Plan (BMZ 2004), the NESP-Ophir project was mentioned as one of the few farmer group projects that still functions since most other group farming approaches had disintegrated after donor assistance ended. This was most likely due to the set up of these other farmer groups, where the governmental KUD approach was adopted, farmer's interests were poorly served, and hence no commitment by members was induced.

10.1.1 Group management

At the outset it was clear that the farmers needed some form of organisation to facilitate, at a minimum, communication with the nucleus estate PTP VI. It was decided to divide the smallholder plantation into 50 ha blocks, as is practiced in estate management, and each of the 25 farmers was allocated a plot of approximately 2 ha.

A key issue was then to decide whether farmers should work as *individuals* within the farmer group or with some kind of *collective management*. A feature and goal of efficient tree crop management in commercial *estates* is the implementation of uniform standards of management across large areas and, in well-run plantations, agreed standards of upkeep and field maintenance are applied over thousands of hectares.

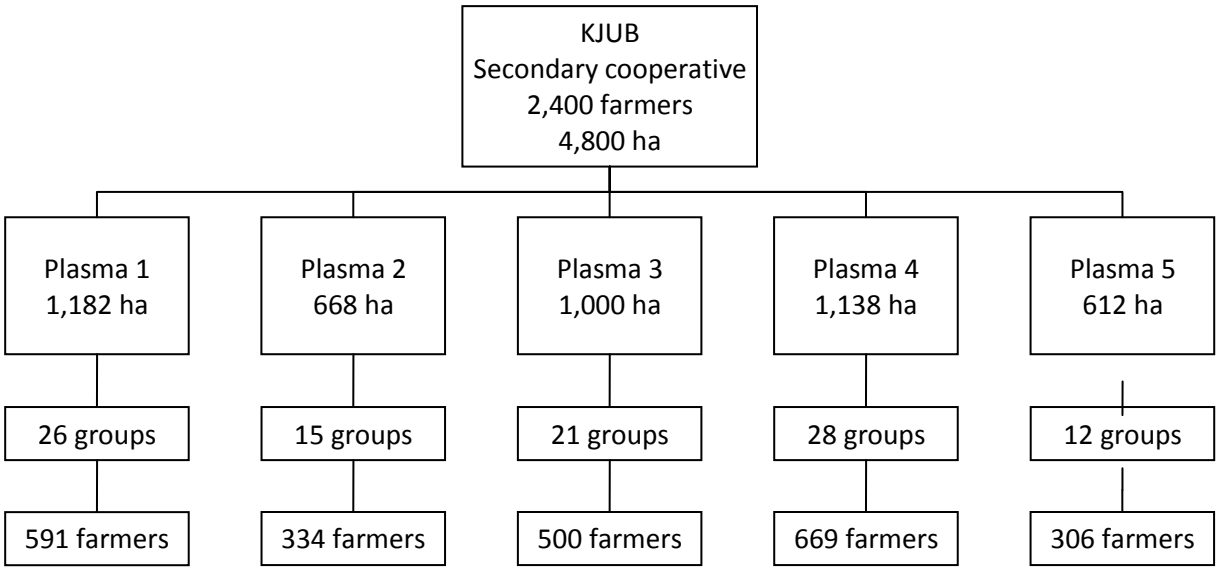

Figure 5 Structure of farmers' organisation in the NES/PIR-BUN Ophir project, comprising a secondary cooperative, primary cooperative and farmer groups.

By contrast, in most smallholder tree crop development schemes, farmers work as individuals, albeit often in 'farmer groups', and standards vary widely between individual farms. This can result in serious problems in terms of crop management. For example, if a particular farmer neglects to control a pest or disease, it may spread and affect production in neighbouring farms. To achieve efficient plantation management, it was decided that smallholder farmers should run their individual holdings within a block as a small plantation with uniform agronomic standards resulting from agreed procedures for upkeep and maintenance (Figure 5).

The mechanism devised to bind farmers into an effective farmer group was that **proceeds from fruit bunch sales were divided equally amongst individual farmers with a small premium for individual performance** based on the number of bunches harvested by each individual farmer. This system of combining group and individual responsibility had a number of crucial impacts on the functioning of farmer groups:

- Each farmer is responsible for harvesting, upkeep and fertilizer application in his individual 2 ha plot but individual farm incomes are based on the average of group performance.
- Shared income generates peer pressure amongst farmers to ensure that individual farmers do not fall behind on important tasks in plantation management. Individual income can only be increased when all members manage their plots properly.
- Each farmer group sets its own rules and penalties for non-compliance with farmer group standards for harvesting, fertilizer application, and attendance at farmer group

meetings. Fines were imposed after discussion at regular monthly farmer group meetings.

- It is in the interest of all farmers to assist members that could not harvest or apply fertilizer due to ill health or absence. In such cases, other farmers in the group would harvest the sick members' crop and charge him for the services rendered. The cost of services rendered would be decided at monthly group meetings and funds deducted with a high degree of transparency using the computerized payment system.
- Key tasks, such as fertilizer application and harvesting, are checked by elected group representatives so that individual farmers were less tempted to sell fertilizer or fruit bunches in the market.

The so-called 'kelompok system' lies at the core of the NESP/PIR-BUN Ophir smallholder organisation and contributed greatly to:

- Timely and completed harvest resulting in complete crop recovery and high yields;
- Uniform standards of field management (very evident during our field inspections);
- Efficient and effective crop transport without the requirement for weighing individual farmers' crop;
- Effective and coordinated control of pests and diseases and maintenance of roads;
- Effective group administration;
- Very low incidence of individual farmer failure and high sense of solidarity amongst farmers within individual farmer groups. The system provides social security in which weaker group members are supported but pay for services supplied;
- Very low incidence of theft of fresh fruit bunches by smallholders and strong group control.

The leader (*ketua*), deputy (*wakil*), technical manager *(petugas tehnis*) and treasurer (*bendahara*) of each group (*kelompok*) are elected for a three year period. These positions receive a salary provided by deductions made by the respective primary cooperative (plasma) on each farmers' monthly payment. Each *kelompok* meets once a month to discuss the current technical, managerial and financial state of the group and to take action where individual members have strayed from group policies and procedures.

The *ketua* also has the responsibility to take care that the *kelompok* plantation is properly maintained and managed. He must arrange labour if activities are not carried out or carried out poorly by a particular smallholder and arrange for the costs of these activities to be recovered from the respective farmer's income. Fines are imposed for e.g., not attending group meetings, poor harvesting, harvesting of unripe bunches, and not providing security after harvesting to avoid the fruit bunch theft by outsiders. The *ketua*, and the *petugas tehnis* in the *kelompok* together with other members check whether the quality of work done (e.g., harvesting, weeding, drainage) in the plantation is up to standard.

During the research period elections had just been held in Plasma 2 and the *kelompok* leaders were handing over responsibility to their successors. In Plasma 5 where a *kelompok* meeting was attended, the new *kelompok* leadership had just taken over from the old, creating some discussion about a new style of financial reporting. During our unexpected attendance at a particular *kelompok* meeting all production, technical and financial data were handed out to all members (see box 9, Annex XVI). These features are indicative of democratic and transparent management. Thus, from our visits it appears that the *kelompok* system still functions well 27 years after it was introduced in 1982 and 13 years after GTZ left the project.

It was clear however that not all members participated actively in meetings. Whilst some farms were represented by female householders, they did not participate actively in discussions and most male

farmers were aged >50 years. More active participation by younger members would probably contribute to more vigorous and useful debate at group meetings.

The farmer groups or *kelompok* are the foundation of all organisational structures in the NESP/PIR-BUN Ophir and control the primary cooperative (plasma) through the annual group leader meeting at which policy and work programmes are presented, debated and decided.

The *kelompok* also provides social services and credit. A social fund can be distributed to families with special needs, credit facilities are available to members who can borrow money at very low interest rates, the *artisan*, a lottery all *kelompok* members participate in, is held at the end of all kelompok meetings and there is much small talk during kelompok meetings, which may last for several hours. These multipurpose activities might at some point be incompatible with each other (e.g., the mixture of banking activities and the social role of supporting families in times of hardship) and there may be a sense that members cannot be too harsh on each other, whilst sometimes this might be necessary for the group interest.

10.1.2 Primary cooperative (plasma)

Clearly, whilst some tasks (e.g., harvesting, fertilizer application) can be organized and controlled at farmer group level, other tasks (e.g., harvest organisation and fertilizer distribution) are more effectively managed at a higher level. How then should the individual farmer groups be organized? At first, a single purpose primary cooperative organisation called the 'Board for Cooperation between Groups' (*Badan Kerjasama Antar Kelompok*, BKAK) was introduced to manage cooperation between farmer groups.

In BKAK, 'single purpose' meant that the organisation catered only for the common requirements of farmer groups for services and management, including:

- Farmer payments system;
- Distribution of fertilizer;
- Organisation of harvesting (sequence of harvest amongst groups);
- Fruit quality control;
- Pest and disease control; and
- Road maintenance.

The BKAK model was used partly to protect the nascent farmers' organisation from the burden of implementing the non-plantation activities required in the KUD system. Leadership in the BKAK was provided by elected officials chosen by three representatives from each farmer group. Re-election of leaders is permitted and an annual meeting, open to all farmers, is held to review progress, debate plans and budgets for the next year's activities and elect leaders.

Table 6 Primary cooperative size (BMZ 1992; Heering 1993)

Plasma	Name	No. farmers	No. groups	Farmers/group	Area (ha)	Area/group (ha)
1	Perintis	591	26	22.7	1,182	45.5
2	Sejahtera	334	15	22.3	668	44.5
3	Indah	500	21	23.8	1,000	47.6
4	Maju	669	28	23.9	1,338	47.8
5	Makmur	306	12	25.5	612	51.0
Total		2,400	102	23.5	4,800	47.1

The primary cooperative is tightly controlled by member groups and farmers, who exercise their rights to scrutinize financial performance and participate in meetings. There are five primary cooperatives in the Ophir project each with about 500 farmers, 1,000 ha and 20 farmer groups (Table 6, Figure 5). Although not exactly the same, it is fair to state that each plasma corresponds to a primary cooperative.

Each primary cooperative included several departments, including a technical unit and a general management unit. The technical unit has taken over the role of Disbun and provides farmers with advice when needed and monitors plantation management. Staff are selected from member farmers or their offspring and provide supervision and control on crop collection points, field upkeep, pest and disease control and improve these aspects or inform the kelompok on what the smallholders should do to rectify deficiencies. The technical unit can be consulted by the smallholders if there are particular problems.

The BKAK was also responsible for the procurement, storage and distribution of fertilizer, the largest cost in oil palm production. With an annual budget of USD 1.7 M in 2008, fertilizer procurement is a major responsibility with huge potential for mismanagement but the farmer organisations have, with few exceptions, ensured timely delivery of fertilizer materials to members for 27 years. The BKAK also arranged for the transport of fruit bunches to the mill (annual budget for crop transport is about USD 0.4 M) using its own trucks as well as trucks hired in from contractors.

Under pressure both from GOI and the farmers themselves, the BKAK was transformed into a *Kooperasi Unit Desa* (KUD) in 1992 to fulfil the requirements of national policy on cooperatives. The government was anxious that the successful Ophir project came into line with the GOI policy on cooperatives whilst the farmers sensed that there were benefits from joining the government KUD system. Farmers were attracted by some of the standard services provided by KUDs such as the provision of nine essential household commodities at controlled prices even though these commodities were readily available on the local market by private enterprise shops. In addition, the KUD structure provided opportunities for other enterprises whilst the BKAK was designed as a single purpose cooperative catering only for the common need of members to manage the plantation.

The BKAK structure remained largely in place and the KUDs did not transform into semi governmental institutions as were most KUDs in Indonesia at that time (Bauer 1991; BMZ 1992; Heering 1993). In particular, the payment system (i.e., sharing of income between members of each farmer group to generate group solidarity) was retained. Similarly, procedures for the election of the cooperative leaders were retained in the KUD structure. At a later stage the KUDs were renamed in their present form as *Kooperasi Perkebunan Sawit* (plasma). The plasma is regarded by most smallholders as a successful organisational unit and led to the conviction amongst members that if the plasma arranged something, it would be a success. It was already evident in 1992 that the plasma were getting more involved in providing credit schemes for smallholders, cooperative shops (which also provide materials needed for *kebun* maintenance), and other activities (BMZ 1992).

At times activities were undertaken without proper feasibility studies and financial control. At present, all the plasma are involved in credit schemes, and are planning to open new plantations to provide plantations for smallholders' offspring. Whilst all the plasma continue to operate stores providing members with the nine essential commodities as well as plantation inputs and tools, it appears that the plasma are also involved in many other activities that divert attention from the core business of the plasma in managing the plantation, as GTZ (1995a) and KfW (2000) also concluded earlier.

In our survey smallholders were asked which plasma functions best and most smallholders selected Plasma 1 as the best functioning plasma (see Figure 6). Plasma 1 was selected because of the wide range of products for sale in the plasma shop, strong leadership and good execution of tasks (see box 8, Annex XVI). Within Plasma 1 smallholders are most content with the services provided by their plasma whilst smallholders in Plasma 3 were most critical about services provided in their Plasma. This difference in farmers perception might be explained by poorer leadership or more critical smallholders, or a combination of both factors.

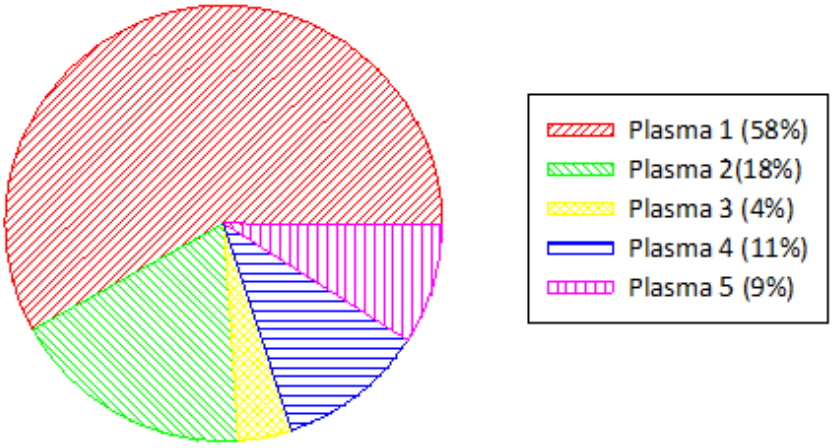

Figure 6 Farmers' perception of best functioning plasma (Source: Own survey). All plasmas received the same weight so the larger plasmas are not overrepresented.

10.1.3 Secondary cooperative (KJUB)

The overarching organisational structure in the Ophir project is the secondary cooperation *Koperasi Jasa Usaha Bersama* (KJUB). This organisation has several functions:

- Representation of all farmers to outside organisations (e.g., PTP VI);
- Management of road maintenance fleet and stone crushing plant;
- Management of farmers payments (e.g., operation of the Amprah system) including printed reports; and
- Management of the farmers' bank, KBPR.

The KJUB is controlled by the leaders of the five plasmas and therefore does not have the direct critical and unrestrained voices of smallholders that carefully observe and check KUD activities. The farmers (rightly) see the KJUB's main responsibility as processing payments with the Amprah system. Our questionnaire indicates that smallholders are more negative about the KJUB compared with other organisational structures.

The position of the KJUB appears more problematic then the other organisational units mainly because there is less direct control by smallholders. Furthermore, the KJUB has become involved in other business activities (e.g., manufacture of fertilizers from crop residues from PTP VI and dolomite) which, whilst they may be approved by the membership, offer considerable opportunities for mismanagement. At present, the KJUB is accused of financial mismanagement of USD 400,000 that may have been used for electioneering and this scandal has reached the press[5].

The financial management at the Plasma and KJUB are complicated for group members to check and in the 1990's there was a *Koperasi Jasa Audit* (KJA), or independent auditing cooperation, who audited the Plasma's and KJUB finances. This system functioned well according to a former GTZ staff member, but during the last visit there was no opportunity to check this. These independent audits however are crucial for maintaining good bookkeeping and avoiding corruption.

[5] E.g. http://www.padang-today.com/index.php?today=news&id=6517, visited 10-07-2009

10.2 Solidarity and Subsidiarity Principle

The three levels of farmer organisation form a system of *solidarity* and *subsidiarity*. The solidarity is an important aspect in the kelompok organisation, at grassroots level, whilst for activities which cannot be managed efficiently at grassroots level the plasmas and KJUB provide additional (subsidiarity) professional services (Peters 1999). For an overview of the solidarity and subsidiarity system see figure 7.

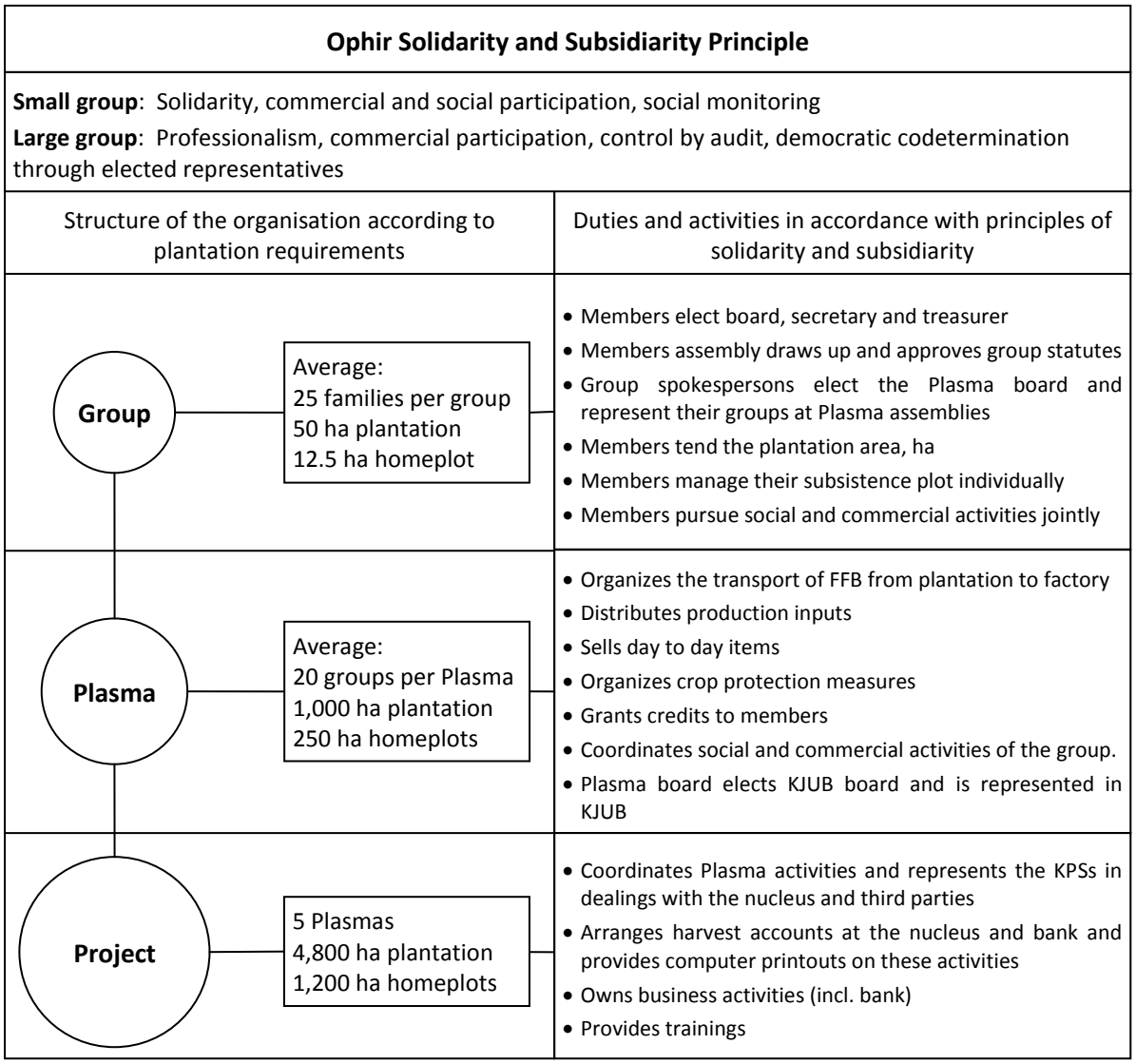

Figure 7 Organisational structure Ophir smallholders (adapted after Peters 1999)

10.3 Financial management

A crucial component in the success of the Ophir farmers' organisation was to setup a properly functioning financial management system with a high degree of transparency to member farmers. Each farmer was provided with a bank account at the local branch of the Area Development Bank (BPD) which received support from the Area Development Project described in section 6.6.

All payments and loan repayments were made via the farmer's individual bank account. The KJUB is responsible for calculating payments to each farmer using the so-called Amprah accounting programme, a computerized payment system specially designed for the farmers' organisation in Ophir.

Each month the Amprah I system calculates for each farmer group:

- Production and gross income per farmer based on the agreed monthly price for fruit bunches;
- Deductions for plantation costs (crop transport, fertilizer, pest management, accounting and management services;
- Net farm income after deducting plantation costs.

All deductions are shown on the calculation sheet so that farmers can check that deductions are in line with plantation costs that were budgeted and agreed at the annual meeting. Similarly, farmers can check that the price used to calculate their gross returns corresponds with the price calculation published by PTP VI. This transparency is key to fostering trust within each farmer group and between farmer groups in each primary cooperative. Furthermore it is very difficult to manipulate the system without it becoming evident to farmers.

The Amprah II is used to reconcile farmer's individual credit repayments for items purchased at the cooperative, and loans with banks that the farmer and respective bank agreed to repay via the direct deductions from smallholder oil palm income. The amount transferred to the respective farmer's account is the net amount after deducting plantation costs (Amprah I) and after deducting loan repayments for cooperative sales and bank repayments.

Whilst the Amprah I shows there is a high degree of uniformity in plantation income amongst farmers within each farmer group, the net income after credit repayments varies greatly between farmers and reflects individual farmers' different preferences to use income for consumption, investments in house improvements or additional business activities. When Amprahs from a kelompok in Plasma 1 were compared with a kelompok in Plasma 5 it appears that the amount of loans are about equal, but are drawn down under different credit schemes. There is, however, much lending going on at kelompok level which is not reported in the Amprah system. Not everything is equally clear about the credit situation in Ophir, although it is obvious that some members take considerable loans, some maybe even above their capacity, which is reflected in minimum payments of IDR 25,000 to smallholders (for an example of Amprah I and Amprah II see Annex IX and X).

10.4 Plantation services provided for farmers by plasma and KJUB

To function efficiently farmers require a number of services from the secondary cooperative organisation and these will be described and discussed in the following sections.

10.4.1 Fruit bunch price

The KJUB monitors the price of fruit bunches paid to growers. The price paid to farmers is based on a pricing formula stipulated by the GOI as follows:

$$\text{Price(USD/t)} = \Big(\big((\text{CPO price (USD/t)} \times \text{OER (\%)}) + (\text{PK price (USD/t)} \times \text{PKER (\%)})\big) \times k\Big) \times i$$

Where OER is the oil extraction rate, PKER is the palm kernel extraction rate, *k* is an adjustment factor set by the government in each province reflecting local cost of sales (i.e., distance from mill to market and processing costs), *i* reflects a price incentive presently set at 1%.

Thus, the price in May 2009 was:

$$\text{USD } 108 = \Big(\big((\text{USD } 554 \times 20\%) + (\text{USD } 228 \times 5.1\%)\big) \times 0.87\Big) \times 1.01$$

PTP VI provides the farmers with evidence of sales contracts to support the prices used. The deterioration in oil extraction rates since the late 1990s coincided with a large increase in the amount of crop purchased by PTPN VI from other sources (Figure 8).

Variation in extraction rates has a huge impact on the price of fruit bunches and it is therefore very important that all crop processed by the mill is harvested ripe. If the mill accepts unripe crop from

some producers, all producers are affected by the lower oil extraction rate! The decrease in extraction ratio from a very acceptable 23% in the 1990s to the present 21% results in a significant drop in the yield of palm products (Figure 9) and a 4% decrease in farm gate price.

The decrease in extraction rates may be explained partly by the increased age of palms in the Ophir project (Corley and Tinker 2003). During our field visits it was evident that ripeness control is now difficult in very tall palms because it is practically impossible to carry out proper pre harvest checks on bunch ripeness. Another explanation for the decreased extraction rates may be lack of maintenance and upgrading at the PTPN VI mill. At present yields, the decrease in oil extraction rate from 23 to 21% is equivalent to a difference of USD 100 ha^{-1} in farmer revenue.

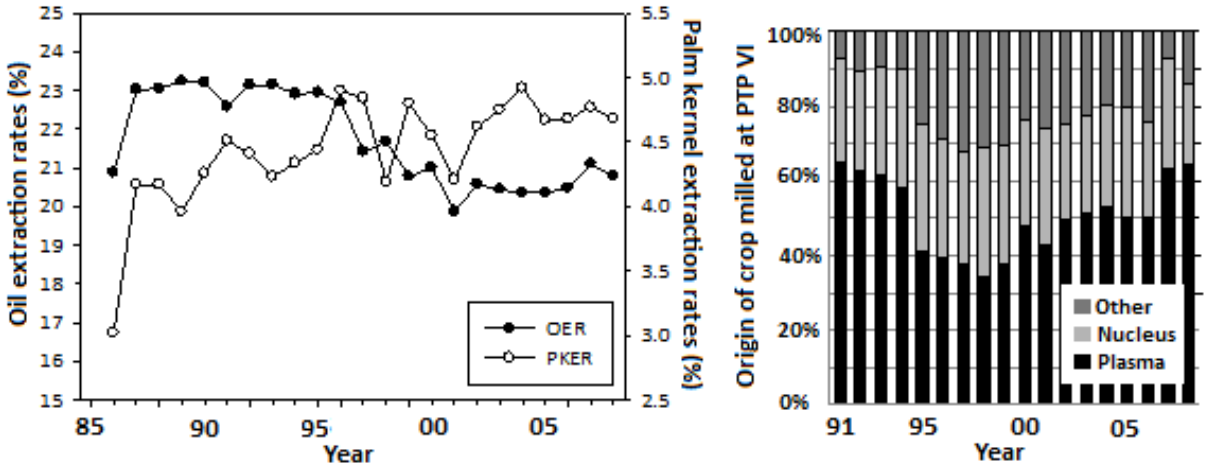

Figure 8 Oil Extraction Ratio (OER) and palm kernel extraction ratio (PKER), and origin FFB at PTPN VI factory in NESP/PIR-BUN Ophir (Source: PTPN VI)

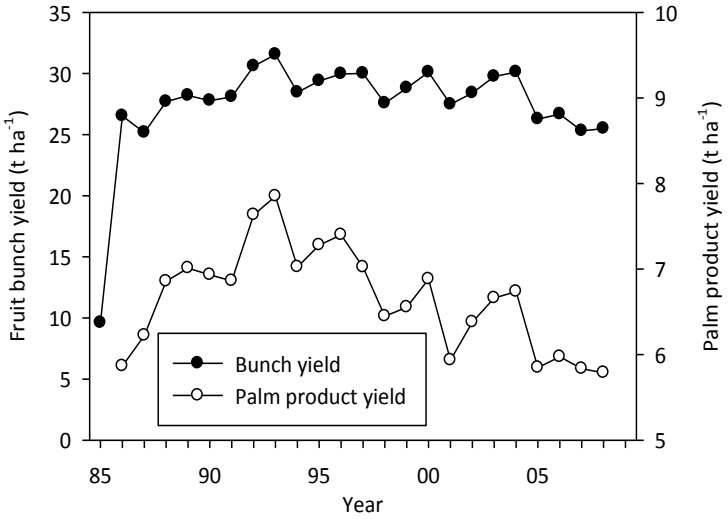

Figure 9 Oil extraction rate and yield of palm products in Plasma 1. Palm products include palm oil and palm kernel oil based on actual extraction rates and kernel oil at 41% of palm kernels (Source: PTPN VI)

10.4.2 Crop transport

The primary cooperatives organize the harvesting schedule and arrange for crop collection and delivery to the PTP VI mill (≤20 km from mill to farmer's plot) using their own and hired-in trucks at a competitive cost of USD 91 ha^{-1} $year^{-1}$ or USD 3.5 t^{-1} fruit bunches. Present unit transport costs compare favourably with standard estate costs. Primary cooperative staff also supervise crop quality and unripe or rotten fruit is rejected in the field. Ripeness standards were very well maintained in the project until the mid 1990s but bunch ripeness assessment becomes more difficult as palms increase in height (palms are now ≤16 m in Plasma 1). This may also help to explain the deterioration

in extraction rate since 1995 (Figure 8) and the absence of an increase in extraction rates from 2000 onwards when Ophir smallholders increased their share in FFB delivery again (Figure 8). Nevertheless, there was evidence of significant amounts of rejected crop on the collection spots of individual farmers in the field during inspections. Farmers are fined by their respective group for harvesting unripe crop.

Because farmers divide the income equally amongst members there is no requirement to weigh each farmer's production separately and instead the production from each farmer group is recorded. This is a considerable saving in terms of labour and time during crop transport.

10.4.3 Pest and disease control

The primary cooperative is responsible for implementing a pest and disease programme using funds collected from members. A fixed amount of USD 16 ha^{-1} $year^{-1}$ is deducted from each farmer in monthly instalments (Annex IV) and costs are greater than standard estate costs. There has been very little incidence of leaf eating pests in farmers' fields but over the past few years Ganoderma (*Ganoderma boninense*) has emerged as a significant disease problem, particularly in Plasma 1, and requires control. A gradual increase in Ganoderma incidence is not surprising because the disease is always more prevalent in areas previously planted to oil palm or coconuts. The control of Ganoderma illustrates well the virtue of 'shared responsibility' in plantation management. If an individual farmer neglected to control Ganoderma, other farmers' palms would be more likely to become infected. Thus, whilst an individual farmer's palms may not be affected, he pays for disease control in other farmers' fields to reduce the chance of disease spread to his own plot.

The primary cooperative employs a team of workers for Ganoderma control and infected palms are dug out and chopped into small pieces to increase the rate of decomposition and reduce the amount of tissue available for colonization by the fungus. Field inspections showed that this work is done quite thoroughly (see photo 4, Annex XVI).

10.4.4 Leaf and soil sampling

The primary cooperative was trained to organize and implement annual leaf sampling for analysis and the Indonesian Oil Palm Research Institute provided fertilizer recommendations based on the results of field inspections and leaf analysis. Leaf sampling and analysis is no longer practiced in Plasma 1 mainly because palm height (~16 m) makes the selection of the reference frond almost impossible and a standard fertilizer recommendation is used in all farmer groups but this varies between Plasma 1-5.

10.4.5 Fertilizer procurement, distribution and application

Fertilizer is the single largest cost of production and the production input with the greatest impact on yield. At present, fertilizer costs are about USD 360 ha^{-1} $year^{-1}$, nearly 50% of the variable costs of production (Annex IV). Even on the high fertility status soils in the Ophir project, large amounts of fertilizer are required to achieve maximum economic yield. Much larger fertilizer inputs would be required on the less fertile but more common red-yellow podzolic soils in other parts of Sumatra and Kalimantan.

Farmers in Plasma 1 apply an average of 4.5 kg palm of compound fertilizer (13 – 3 – 27 + 4 MgO + 0.5 B) in four split applications. The farmers' organisation considers the additional cost of compound fertilizer is compensated by greater convenience of application (i.e., less fertilizer material to transport and spread). In reality, the amount of straight fertilizers required would be only slightly greater but the additional cost of compounds is significant (about USD 70 ha^{-1}).

Fertilizers are procured based on a tender process by the respective primary cooperative that is also responsible for temporary storage and transport to the farmers' fields. Whilst other tasks (harvesting, weed control) are usually carried out by contracted labour under the supervision of the *ketua kelompok*, farmers generally take more direct control over fertilizer application (see Annex XI). Each farmer group carries out stringent checks to prevent the possibility that fertilizers are sold by

individual farmers on the open market since this would reduce average yield and thus farmer income.

The spreadsheet model constructed by Giller *et al*. (2009) can be used to calculate the nutrient balance for oil palm in Plasma 1 after making some assumptions for leaf and trunk nutrient mass fractions in trunk and leaf parts (Table 7). Nutrient balance for all nutrients is negative because additions in mineral fertilizer are insufficient to compensate for removal in fruit bunches and farmers do not apply crop residues. It is standard practice to reduce or even stop all fertilizer application a few years prior to replanting and since the farmers plan to replant in 2011 the present negative nutrient balances are acceptable.

Table 7 Nutrient balances for oil palm in Plasma 1 in 2009 (kg/ha)

	Nutrient			
	N	P	K	Mg
Fertilizer inputs	79	8	136	15
Removed in crop products	130	14	117	18
Trunk incremental growth	9	1	29	2
Total removal	139	15	146	20
Balance	-60	-7	-10	-5

Use of empty bunches in farmers' fields was demonstrated in Plasma in 1991 but was not encouraged by PTP VI and has since only been taken up by a few farmer groups. Fertilizer use contributes a large proportion of total CO_2 emissions from oil palm production and thus substitution of fertilizers with crop residues contributes to improved assessment of system sustainability. Considering the present high cost of mineral fertilizers and the possibility to back-load trucks transporting fruit bunches with empty bunches this is a considerable missed opportunity for farmers to reduce fertilizer costs and improve system sustainability.

10.4.6 Road maintenance

The road layout in the smallholder plantation is no different from a standard estate design except that the total amount of roads required is greater because of the requirement for roads in farmer villages (Table 8).

Table 8 Infrastructure in the NESP/PIR-BUN Ophir project

Item	Amount	Units	Units/ha
Collector roads	43,700	m	9.1
Feeder roads	129,700	m	27.0
Village roads	24,100	m	5.0
Total	197,500	m	41.1
Bridges	579		

PTPN VI was responsible for infrastructure development but once completed maintenance became the smallholders' responsibility. Each primary cooperative collects a cess from farmers for road maintenance equivalent to USD 26 ha^{-1}, equivalent to about USD 0.6 m^{-1}. Costs compare favourably with standard estate costs. A programme is drawn up each year for road improvements, including repairs to culverts and bridges and reforming roads where the gravel surface has been eroded. During fieldwork it was observed that most of the roads were in fair condition (see photo 5, Annex XVI) except for the road between Plasma 3 and 4 which urgently requires grading.

KJUB were provided by GTZ with a stone crusher and this continues to supply crushed stone material for road maintenance and upgrading. The heavy equipment supplied by GTZ (light grader and compactor) is no longer operational but the stone crusher is still used to provide aggregate for upgrading roads in the smallholders fields and some gravel is sold to 3rd party purchasers by KJUB as a business activity.

10.4.7 Replanting

It is a significant achievement that farmers have continued to maintain excellent standards of harvesting and canopy management and yield in Plasma 1 and 2 in spite of palm height (Table 9). Whilst funds have been set aside for replanting by regular deductions over the past 25 years, farmers have not yet started to replant in Plasma 1 where palms are now very tall (about 16 m from ground level to the height of bunches; see photo 9, Annex XVI). Most commercial estates replant when palms reach a height of 12-13 m because of reduced yield due to loss of productive palms to pest and disease and increased difficulty of harvesting.

Table 9 Age plantation related to generation and replanting (Source: BMZ 1992; own fieldwork)

Plasma	Year of 1st plantings	Present maximum palm height (m)	Yield 2008 (t ha^{-1} fruit bunches)	2nd generation farmers (%)	Farmers that want to replant (%)
1	81/82	15.6	25.5	22	11
2	82/83	15.0	23.5	60	20
3	83/84	14.4	22.8	32	12
4	85/86	13.2	21.7	32	12
5	84/85	13.8	24.6	13	20

Farmers in Plasma 1 are presently planning to start replanting in a stepwise process in 2011. The plasma leadership presents a proposal for replanting schedules at the annual general meeting and this must be endorsed by the farmers' group representatives before implementation. The Plasma organizes replanting (seedlings, fertilizer, planning) but the farmers groups will be responsible for implementation. Each year, one half of each farmer group will be replanted so that palm income is better sustained through the replanting period than when each farmer group replants in one year (Table 10). Farmers plan to intercrop replanted palms with hybrid maize in the first year after planting to supplement their palm income.

Table 10 Yields and overall productivity over the replanting period when each farmer group is replanted over two years.

Year	Old stand		Replant 1		Replant 2		Total	
	Area	t ha^{-1}	Area	t ha^{-1}	Area	t ha^{-1}	Area	t ha^{-1}
1	50	26	0	0	0	0	50	26.0
2	25	26	25	0	0	0	50	13.0
3	0	0	25	0	25	0	50	-
4	0	0	25	10	25	0	50	5.0
5	0	0	25	15	25	10	50	12.5
6	0	0	25	20	25	15	50	17.5
7	0	0	25	25	25	20	50	22.5
8	0	0	25	30	25	25	50	27.5
9	0	0	25	30	25	30	50	30.0

The group income sharing approach means that it is possible to replant each 50 ha block rather than each individual farmers' plot in two phases resulting in considerably easier management. During the

workshop farmers decided that income from intercrops would also be shared amongst group members.

The KJUB is well placed to run the nursery for replanting since, once replanting starts, there will be a continuous requirement for seedlings until all plasma have been replanted. At present, however, farmers' confidence in KJUB has been eroded due to KJUB's poor management of business activities and lack of transparency on financial management. This explains the consensus in Plasma 1 to either contract a private sector estate to produce seedlings or make and manage their own nursery. The long-term future of the Ophir project hinges upon successful implementation of replanting (see Section 13.1) and Plasma 1 will likely set the standard for operations in the other four plasma units.

10.4.8 Plantation gross margin

A gross margin analysis was provided by BMZ in the project evaluation carried out in 1992 (BMZ 1992). We have updated the model with present prices to compare the effect of changes in prices on the gross margin (Annex IV). Overall, the price of variable costs (inputs) and net average farm income (outputs) have increased respectively by a factor of 1.95 and 1.56. The costs of labour and management charges have increased respectively by 4 and 4.1. Whilst the increase in management charges may be partly because initial deductions made for primary cooperative services were unrealistically low, there may be scope for improved efficiency in management services. More information on changing labour expenses is provided in section 10.5.

10.4.9 Input requirements

Each primary cooperative operates a cooperative store that supplies harvesting poles, high quality harvesting sickles, wheelbarrows and other hand tools required for oil palm cultivation. The cost of tools is in some cases recovered from farmers through the Amprah II system. In other cases contract harvesters purchase harvesting poles and high quality sickles, usually with a contribution from the smallholder.

10.5 Farmers use of plantation labour

There has been a shift in the division of labour within the plantation over the past 20 years as currently most work is performed by land labourers and the amount of work carried out by farmers appears to have decreased (Figure 10). It is significant that in the plasma regarded by 55% of all smallholders to be the best plasma (Figure 6), most labour still is contributed by the nucleus family, whilst in other plasmas the percentage of hired labour is considerably larger.

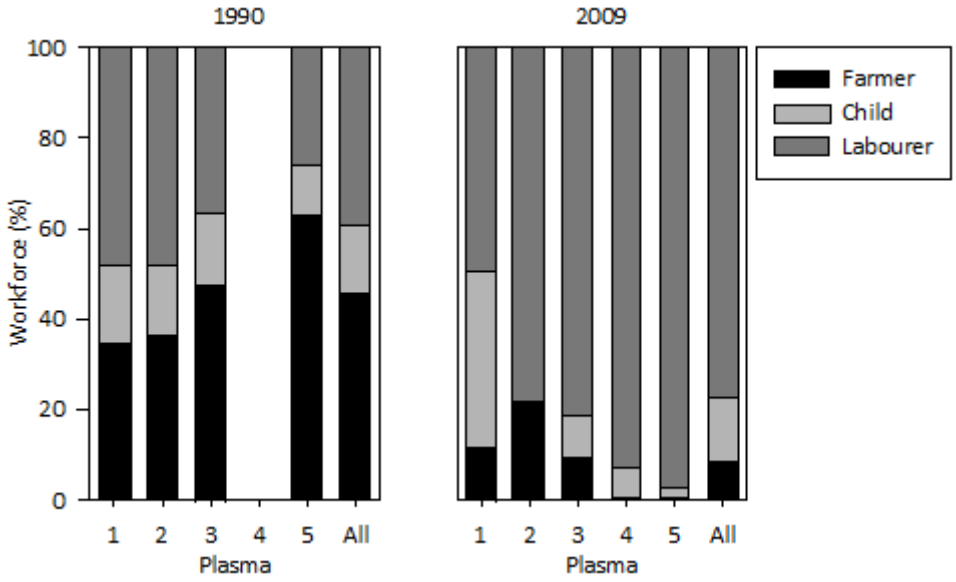

Figure 10 Division of labour in 1990 (Bergschneider 1990) and 2009 (own data). Plasma 4 was not in full production yet in 1990 and therefore there is no data for Plasma 4 in 1990.

Our survey revealed that Ophir smallholders tend to hire labour when they become too old to work, lack the particular skills required or are occupied by other activities. In Plasma 1 it is not surprising that the aging 1st generation farmers in Plasma 1 no longer harvest palms that have now reached a height of ~16 m (see Table 9). Farmers can readily afford to employ workers to carry out harvesting and field upkeep and many farmers see a better return on their labour from other business activities that are underpinned by the income they receive from palm. In the 1990s, use of contract labour was considered evidence of project failure (Bergschneider 1990) but it seems only logical that skilful labourers are hired when farmers can afford to diversify into other activities. The project purpose was to provide a platform for economic development! More information on division of labour is provided in Annex XI.

Children are responsible for a significant amount of work in Plasma 1 (Figure 10 and Annex XI). It has to be noted, however, that most smallholders are old and their children are already adults, and most people seen in the field were adults. During multiple field visits one school going child was seen assisting his father, a land labourer. The land labourer brought his son to school in the morning before starting activities in the field himself and his son joined him after school. It appeared the same as in Europe where it is not uncommon that children sometimes assist their parents in a family business like a farm. This was the only case reported of a child doing labour in the plantation and there appears no evidence that 'child labour' as such is an issue in the Ophir plantation.

There is great diversity amongst land labourers. Some come from northern Sumatra and work fulltime in the plantation (maintaining 7 to 9 *kaplings* or farmers' plots) whilst others come from nearby villages. Children of smallholders also sometimes work in the plots of other smallholders and some workers from the neighbouring villages maintain one or two farmer plots as a side activity. The problem of underpaid land labourers as described by BMZ (2004) and Bergscheider (1990), was not found during our surveys. On the contrary, full time land labourers earned between USD 150-400 per month, which is a respectable salary for unskilled work in Indonesia.

The fears expressed by KfW (BMZ 1992; KfW 2000) about land labourers taking over all work and not performing management tasks properly appears to have been unfounded. Whilst much of the plantation management work has been taken over by labourers, farmers themselves as well as the *ketua kelompok*, supervise and check the quality of work carried out in the plantation. When tasks such as harvesting or weeding are carried out below the required standard the respective farmer is fined. The landowner passes part of the fine on to the land labourer, who is thus motivated to carry out his work according to defined standards. Smallholders have established long term relationships with workers and we met many workers that have been working in the Ophir project for many years. Smallholders indicated on several occasions they do not want a rapidly changing labour force in their plantation and recognize the importance of investing in a stable workforce (as all commercial estates do!). It appeared labourers learned their trade the hard way, however, without direct training from the smallholder organisations. There were no indications of special health and safety measures taken by smallholders or labourers, or a system for reporting incidents related to safety.

The change in execution of labour activities means that smallholders assume a different role in the plantation. Smallholders change from being active farmers to managers and controllers of the work performed by labourers, thereby becoming small entrepreneurs. This does not appear to be a negative development *per se* as labourers earn a fair wage and oil palm management has been done efficiently over a long period of time. Further, this has changed labour pattern and provides even more people with an income from the plantation and it is a normal development that people want to move on from being smallholders. However, the change does have implications for the setup and content of trainings for smallholders and for the feeling of 'togetherness' in the project. The content of current training programmes, and the extent to which training has coevolved with the changed labour pattern was not investigated in our study. For more on the impacts of decreased togetherness see Section 13.3.

10.6 Farmer exit and entry strategy

By the 1990s it was thought that inheritance might become a problem as parcels of land might be divided amongst children (GTZ 1995a; KfW 2000) but so far there have been no such problems, most likely because the majority of farmer offspring do not work on their parent's plantation and only share the profits made under their parents'name. Some older farmers have transferred the management and share the proceeds of their plot with one of their children whilst the plot remains under the parents' name. Official regulations under the '*suami, isteri anak*' system of inheritance require that the ownership of a plot first passes between spouses and then to their children.

The plot owner may also decide to sell the plot and leave the project. The first option to purchase a plot is given to children of other group members and then to prospective buyers from outside the project, but the group must approve the incoming farmer as suitable because this person must join in the shared income and responsibility approach to plantation management. A smallholder can sell his house and home plot and palm oil plot separately but cannot divide and sell part of the palm oil plot.

The value of farmer plots comprising 2 ha plantation, 0.5 ha home garden and house ranges from USD 14-18,000[6]. A plot purchased in 2009 for USD 18,000 provides a net income of USD 4,827 year^{-1} and internal rate of return of 25% (calculated over ten years) and a pay-back period of five years assuming an interest rate of 15% on borrowed money.

The large proportion of second generation succession in Plasma 2 could be explained by the high percentage of veterans in this plasma that were already relatively old when they joined the project (Table 9). Also the high percentage of second generation smallholders might explain why the number of children who perform labour in the Plasma 2 is small and why there are relatively many smallholders are still active in plantation management. However, the succession of veterans would also be expected for Plasma 4, where a large proportion of the settlers were veterans as well but, according to our survey, this does not appear to be the case. Further research is required to be able to draw stronger conclusions.

Concern was expressed in the past that the second generation farmers were not trained properly in the basic philosophy of the project and the skills required for running an oil palm plantation (GTZ 1995a; KfW 2000). To what extent this holds true remains unclear and would need further investigation. Children of the farmers have been exposed to the principles of the system for years already and might therefore not need the extensive training their parents had. It might however also be that the children are now also involved in other activities and take the system for granted, thus forgetting the necessity of the group system and solidarity. Deterioration in group management would likely impact on the quality of field work but we found little evidence for this during our surveys. For more on second generation smallholders and understanding of project philosophy see Section 13.

10.7 Use of home garden plots

Home plots were allocated to farmers to provide the means for food security during the first few years and later to provide the means for farmers to diversify their agricultural income. Smallholders are free to use their home plot as they choose. Thus, initially farmers used the home plot to cultivate staple food crops and some annual cash crops. Once incomes from oil palm increased, most farmers either established tree crops (cocoa, coconuts), fruit trees or fish ponds to provide supplementary income. The KPSs produced cocoa and coffee seedlings from high quality seed in the early 1990s and many farmers have now established productive cocoa plantings in their 0.5 ha home plot.

Beside of the considerable income generated from the home plots, they also provide a means of risk reduction when the returns from the oil palms are poor. In times of crisis farmers can easily grow

[6] In 2009, commercial estate plantings (including milling facilities and other infrastructure) are valued at USD 5-8,000 ha^{-1} depending on the quality of the planted land and infrastructure.

crops as cassava or other basic food needs and the home plot can deliver a substantial part of a family's food requirements.

Our survey indicates that about 80% of smallholders that reside in the plantation use their home plots for commercial agriculture. The average income from home plots used for commercial production is about USD 50 per month. About 20% of participants indicated they mainly use their home plots to grow crops for home consumption.

According to a former GTZ team leader the home plots were also meant to create an environmental interruption of the oil palm monoculture and contributed to a more diversified environment for people living in the plantation (pers. comm., Peters 2009).

11. Project results based on literature review and field surveys

11.1 Farmer loan repayments

Each farmer in Ophir was provided with a loan to cover the cost of his oil palm plot, home garden and house (Table 11). Loan repayments commenced after an initial two-year 'grace period' when palm yields were still increasing and farmers had limited income from their oil palm plot, in Plasma 4 and 5. However, some smallholders were able to start repaying sooner and only took a one year grace period. Repayments were then deducted at a rate of 30% of gross proceeds (BMZ 1992; GTZ 1995b).

Table 11 Credit components for smallholders (Heering, unknown)

Item	Amount (USD)	%
Land Clearing and Land certificate	76	3
House	380	16
2 ha plot, ready to harvest	1,064	44
Cost of infrastructure	570	24
Interest	304	13
Total	2,394	100

Table 12 Overview loan repayment in Millions IDR (GTZ 1995b; KfW 2000), (Own data)

Plasma	1st plantings	1st harvest	Conversion (years)	Loan	Interest	Repayment completion		
						Planned	Actual	Years*
1	82	1985	3	3,295	928	2002	91/92	4-5
2	82/83	1986	3-4	2,133	690	2003	92	4
3	83/84	1987	3-4	3,147	1,095	2004	93/94	4-5
4	85/86	1991	6	6,543	2,480	2007	98	5-6
5	84	1989	5	3,194	519	2005	95	4-5

* Number of years to complete loan repayment excluding grace period.

Repayments in the Ophir project were completed in 4 to 6 years and exceeded expectations (Table 12). Farmers in oil palm NES-PIR schemes generally achieved good rates of payment compared with similarly designed schemes with coconut and rubber (Susila 2004) but the rapid rates of repayment in Ophir can be explained by sustained high yields, competitive costs of production and favourable palm oil prices during the late 1980s and early 1990s.

The quality of plantation development has a large effect on the duration of the immature period and the yield in the first year of production. Because of the time value of money large yields in the first few years of production have a much greater effect on the internal rate of return and pay-back time than differences in yield later on.

11.2 Plantation agronomy

The overall average yield across all plasma and years (1985-2009) is 24.4 t ha^{-1}, which compares favourably with the PTP VI (18.7 t ha^{-1}) and leading listed oil palm plantation companies (Figure 11, Table 13 (Tiah, Loo et al. 2006). The palm stand in the plasmas is slightly higher than in the nucleus estate but does not explain the differences in yield. It is also noteworthy that yield variability within

each plasma is comparatively small compared with differences between each plasma (Figure 11). Costs of production in the Ophir project compare favourably with commercial estates.

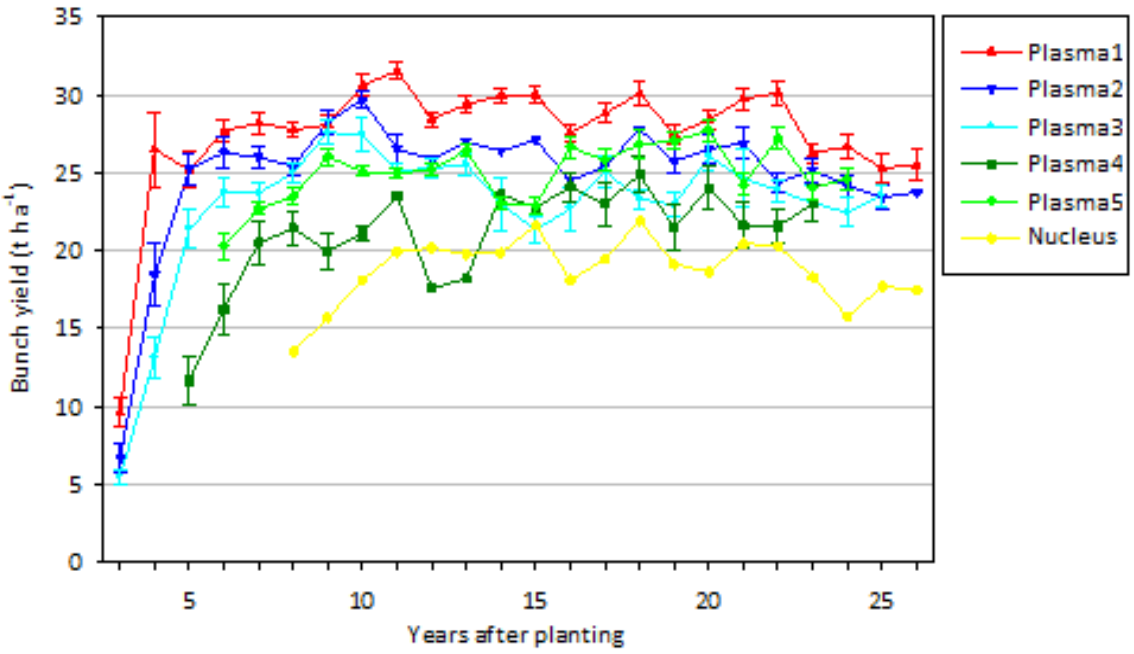

Figure 11 Yields in smallholder plasma 1-5 and the nucleus plantation PTPN VI Inti by year after planting (YAP)

Table 13 Fruit bunch yields in leading listed plantation companies in Malaysia and Indonesia (Tiah, Loo et al. 2006).

Company	2004	2005	2006 (estimate)
Astra Agro Lestari	16.6	19	21
London Sumatra Indonesia	24.1	23.3	22
IOI Corp	23.9	27.6	26.9
Kuala Lumpur Kepong	21.6	22.9	23
Golden Hope Plantations	20.8	22.7	22.1
PPB Oil Palms	20.5	22.7	23.3
Wilmar International	20	18.2	21
Weighted average			22.5

A number of factors explain the outstanding performance of the Ophir smallholders:

- Excellent soils and climate;
- High standards of crop management during the immature phase (except for Plasma 4);
- Complete cop recovery and implementation of standardized plantation techniques using profit sharing as an incentive for disciplined implementation of agreed procedures;
- Regular application of sufficient quantities of mineral fertilizer to produce maximum economic yield;
- Efficient transport system to ensure timely delivery of all crop to the PTP VI mill; and
- Adequate milling capacity at PTP VI to process all smallholder crop.

11.3 Environmental impact

The impacts of the Ophir project on the environment are manifold, some negative and others positive. Shifting cultivation was a common practice in West Pasaman in the 1980s and the Ophir project has likely contributed significantly to the conversion to permanent agriculture in the area. Whilst the amount of deforestation in West Pasaman was comparatively small considering the amount of economic development that has taken place over the past thirty years (KfW 2000), there has been considerable encroachment into forest reserves to the East of the plantation in the foothills of Gunung Talamau which was supposed to remain as protected forest. Local people (including some farmers from the Ophir project) have cleared forest and established cocoa and oil palm plots on steep land that is not suitable for tree crops. The Ophir project has clearly contributed, although indirectly, to these developments.

The Ophir project was planted before the advent of policies to improve agrochemical use and palms were planted up to the river edge and without buffer zones. As a result, there is greater risk of river contamination from fertilizers and pesticides applied in the field and buffer zones should be installed along rivers at replanting (see Section 12 on RSPO criteria and Annex XIV).

Farmers indicated that, in the past, they could sometimes hear tigers roar in the distance. This is no longer the case, and of course the people are glad this threat has disappeared. The concept of nature as a dangerous place is the general perception amongst local people.

The biggest environmental impact of the Ophir project was probably indirect. The success of the Ophir project prompted a palm oil boom in West Pasaman which eventually led to an increase in oil palm acreage from around 8,000 ha in 1988 to 314,884 ha in 2008 (Badan Pusat Statistik 2008). This increase occurred on cultivated (agricultural) and uncultivated (forest, swamp) land.

11.4 Changes to soil properties

We sampled soil at two depths (0-20 cm and 20-40 cm) from beneath palm circles, the frond stack and inter row paths in Kelompok 2, the site of previous similar investigations into soil fertility carried out in 1992 (Fairhurst 1996) and 1975 (Rosenquist and Anderson 1975) (Annex VI and VII). Soil analysis data must be interpreted with great care and caution since a different analytical laboratory and, in some cases, different analytical methods were used in the two studies. However, some important trends include:

- Evidence of soil acidification in palm circles due to the application of N fertilizer (Annex VI a);
- Increased concentration of soil organic carbon in soil beneath the frond stack (Annex VI b);
- Soil available P appears to be depleted in soil beneath the frond stack and inter-row paths and sustained in top soil beneath the palm circle where P fertilizer are applied (Annex VI d);
- The amount of soil exchangeable calcium and magnesium has increased in soil beneath the frond stack due to the application of pruned fronds.

It is difficult to explain the increase in soil exchangeable potassium in all zones. After a long period of cropping, depletion would be more likely.

11.5 Local socio-economic impacts

11.5.1 Food security and nutritional situation

In a nutritional study carried out in the post project support phase, the diet of Ophir farmers was found to be better than in another nearby village outside the project (Raimund 1994). Raimund concluded in her report that '*…the influence of the OPHIR project through providing people with sufficient income as well as homeplots or housegardens had positive impacts on peoples' quantitative and qualitative nutrient intake* '. In another study on poverty reduction in the Ophir area Droomers (1995) used the anthropometric indicators height and weight as indicators for poverty. She

measured stunting in children younger than five years (the age group most sensitive to poor nutrition), which is a major cause of retarded body growth (Droomers 1995).

Stunting is caused by deficiencies in nutritional intake and prevalence of infectious diseases. Droomers study showed that there was less stunting amongst children in the Ophir project area than in the area surrounding the project and considerably less than in a reference village 30 km from Ophir (Table 14). There is little reason to suspect that food security within the Ophir project has declined since this study was conducted and when a local school was visited, there was no sign of undernourished children.

Table 14 Stunting of children in West Pasaman in 1990 (GTZ 1995b)

Area	% stunting
Ophir area	21
ADP area (mainly Simpang Empat and Simpang Tiga)	27
Talu (reference area 30 km from Ophir)	46

11.5.2 Job creation

The NESP-Ophir project functioned as an engine for development of the region created jobs and income for nearly 4,000 families (BMZ 1992) (Table 15).

Although it could not be estimated how many indirect jobs were created it is obvious that the spending power of Ophir smallholders was large and created a high demand for food and trade goods. The towns of Simpang Emat, Simpag Tiga, Padang Tujuh on the perimeter of the Ophir project have now developed from small hamlets to thriving commercial centres well equipped with shops and services (banks, small hospitals) mainly because the large surplus income of Ophir farmers has created a market for goods and services. This is an important point favouring smallholder development rather than estates. An area of 4,800 ha smallholder oil palm provides employment for 2,400 farmer families but if the area was managed as an estate the number of people employed would be about 600 (about eight ha per worker). Properly established and managed oil palm smallholder schemes are rightly considered a powerful tool for regional rural development, as was anticipated in the initial goals set for the Ophir project. The purchasing power of 600 workers is, of course, small compared with comparatively wealthy smallholder oil palm farmers.

Table 15 Direct employment created by the Ophir project (BMZ 1992)

Employment	Number
Smallholders	2,400
Farmer organisation	220
PTPN VI	800
Land labourers	400
Total	3,820

11.6 Comparison with other oil palm smallholder schemes

11.6.1 Ophir system vs. KKPA system

In the 1990s GOI policy for smallholder oil palm development changed from the NES/PIR approach to the PIR-KKPA, PIR-Trans, PIR-BUN and PIR-Lokal models. The Indonesian private sector oil palm area boomed in the 1990s (Figure 1) and the smallholder component in this boom period mainly comprised KKPA schemes. Private sector development was regarded as a catalyst for efficient management, employment and contributing to regional development as the failure rate in public sector schemes was quite high (see Section 7.1). The KKPA schemes differed in two ways from the

NESP-Ophir scheme. First, the KKPA schemes lack the share responsibility approach developed in the Ophir project and second, the ratio of nucleus estate to smallholder plantation is much wider.

A major difference between the KKPA schemes and the Ophir project is the more individualistic approach in KKPA compared with the group system in Ophir. Although there are *kelompoks*, it is the KUD that solves technical production problems and farmers are passive actors as the KUD arranges for labourers to work the land, provide inputs and check the quality of production. The KUD consists of smallholders but the KUD is effectively supervised and controlled by the nucleus estate. KKPA organisational structure is thereby fundamentally different from the self-help groups in the Ophir project as there is little responsibility for smallholders. There is no peer pressure from smallholders in KKPA schemes to convince other smallholders to maintain high standards in their fields, as this is the responsibility of the KUD and the company supervisors. KKPA smallholder schemes therefore appear to be extensions of company activities with local populations receiving a share in the proceeds.

Ophir farmers in general still live next or near to their plantation, whilst in the KKPA system farmers all live outside the plantation and only visit the plantations once per month to collect their income. Also in Ophir, farmers and land labourers usually know each other and have personal contact, whilst in the KKPA project we visited these relationships appeared more tenuous. Smallholders in KKPA schemes appear to have little responsibility and commitment to the land or each other and there is no group binding system as group income or systems which enhance peer pressure. Comments by AMP management reconfirmed this by stating that smallholder production was usually equal to nucleus production, although sometimes less as smallholders or land labourers did not apply fertilizers. This does not receive the same sanctions and controls by smallholders as in the participatory Ophir system, where farmers are dependent on each other and there is more social pressure to keep up production.

Land sales within KKPA systems are easier to execute as there is no (social) obligation or discussion necessary with other smallholders. KKPA schemes thus resemble *gesellschafts* compared with the *gemeinschaft* orientated NESP-Ophir project. It is not really a project in which smallholders participate, decide and feel commitment to. Production and also production standards are thus based on anonymous mass production compared with highly efficient grassroots organized labour. This leads to equal situations as with large estates, which become production areas that are more or less fenced off and are not open for other activities or drivers of regional development. The KKPA scheme visited appears to be a rent seeking activity for smallholders and might contribute to development, but not in the plantation area itself.

The ratio of nucleus estate to plasma was different in the KKPA schemes. According to Sawit Watch and Forest People's Programme, most KKPA schemes have a land distribution ratio (estate to smallholder) of 60:40 up to 90:10. This implies that 60 to 90 percent of the land provided by local people is transformed into nucleus estate and 10 to 40 percent is transformed into smallholder plots (Colchester, Jiwan et al. 2007). This contrasts with the parastatal NES projects, in which ratios of 20 percent for nucleus and 80 for smallholders are aimed for (BMZ 1992).

In Ophir the distribution eventually became 60 percent of land for smallholders and 40 percent for nucleus estate, as PTPN VI expanded their land area beyond the original plans. The difference in the proportion of land is crucial for the mutual dependency of the actors. When the company has a large production area it is less dependent on smallholders to make use of installed mill capacity and therefore has less incentive to provide good services to the smallholders. In KKPA schemes there is little dependency of the nucleus on the smallholders and therefore smallholders are not regarded as serious partners for development. Smallholders are seen as a side activity for decreasing social unrest, fulfilling government requirements and to facilitate access to low cost credit. KKPA schemes thus appear fundamentally not to be aimed at making use of the benefits of smallholder production but driven by other motivations.

During an interview with a company concerning a KKPA scheme, the manager stressed how well the local community was involved in this project. The *ninik mamak* (local leader) was consulted all

through the process of land acquisition and he, representing the local community, distributed the smallholder plots to his clan members. The inclusion of local community therefore appeared to be provided for, but in practice relations between businesses, the authorities and local populations frequently lead to social conflict (Afrizal 2007; Colchester, Jiwan et al. 2007). For more on the impacts of increased palm oil activities in West Sumatra and relations between the state, palm oil businesses and local populations see Annex XIII.

11.6.2 Ophir smallholders vs. individual smallholders

At least 23% of Ophir farmers cultivate oil palms on additional land outside the project area (Own survey, 2009). During interviews it was repeatedly stated that these fields are less productive than Ophir mainly because there is no control system or group pressure that forces the owner to take care of their oil palm. As one woman put it '*...the yields are lower as we just take from these fields without spending too much effort and inputs on these fields. This is because there is no pressure from the group telling us that we have to maintain the kebun better*. *There is nobody that will fine us if we don't do a certain activity...*' (interview, 19-04-2009). Clearly, poorer standards of field upkeep lead to lower yields.

A man from Desa Sidumulyo who worked as a land labourer in Plasma 4 indicated that he also had a small plot with oil palm himself but that production is lower there. The reason he provided for this is that sometimes he does not have funds to apply fertilizer, but recognized that the consequence would be lower production in the future (interview, 06-05-2009). In addition, informal smallholders tend to plant seedlings grown from production palms which are not intended for breeding, resulting in lower yields. The impact of poor quality planting material is huge as palms usually have a lifespan of 25 years.

11.7 Transfer of Ophir concept to other projects

The Ophir post project phase (Phase V) promoted the Ophir participatory approach in other PIR projects in West Sumatra. Also a GTZ staff member who was involved in setting up the project was transferred to Jakarta to promote the Ophir model within the relevant ministries. Former GTZ staff indicated that implementing the participatory Ophir principle in other projects was difficult because, aside the lack of funds in PIR projects for smallholder development, government officials found it hard to accept the concept of self-reliant farmers. Without the knowledge on how to set up self reliant farmer organisations as provided by GTZ, as well as the political backing that GTZ provided, smallholders in other projects were in a weaker position to build self-reliant and independent smallholder organisations. Strong and efficient farmer groups similar to those in the Ophir project have not developed elsewhere. During the Suharto era the NES**P**-Ophir concept never had really good prospects of being implemented at a larger scale as some of its fundamental tenets were not in line with government policy concerning the position and capability of farmers.

After the government instigated PIR schedules the PIR-KKPA schemes surfaced in which there is more direct control by companies on smallholders. Also here developers of palm oil estates appeared hesitant about the capacities of smallholders as well and are led by arguments that favour efficient company management versus smallholder failures. Some companies became involved in smallholder development merely to gain access to land, cheap credit and fulfil government requirements on regional development. Smallholder developments with such intentions frequently lead to social problems as they did not aim to support self-reliant organized smallholders. Colchester *et al*. (2007) emphasizes that problems associated with oil palm development are often related not so much to companies developing oil palm plantations *per se* but to problems with land conversion and the amount of land provided to smallholders (in terms of both quality and quality), methods used to gain access to land, and other poorly executed environmental practices that cause conflict between local communities and companies and give oil palm developments a bad name.

Dr. Afrizal, a senior sociology lecturer at Andalas University indicates that in Ophir most of these negative issues do not appear to have been present and that if the Ophir model would have been applied as intended elsewhere, meaning without modifications by government or business interests,

sufficient funding and trainings, there probably would have been less social conflict regarding oil palm developments in the region. For more on palm oil developments and related social conflicts in West Sumatra see Annex XIII.

It appears that the NESP Ophir concept has not been implemented in other projects because of:

- The time taken to set up viable farmers organisations.
- Lack of knowledge at companies, governments and other parties necessary to implement organised smallholder schemes.
- Fear for increased power of smallholders at the expense of control by companies and governments.

Although the Ophir system contributes more to regional development then other approaches to plantation development, the GOI appears more tempted to support estate development. A possible explanation for this is that companies are easier to tax.

12. RSPO certification in Ophir

The NESP-Ophir project was set up in the 1980's whilst the RSPO was founded in 2004, and it is therefore not surprising that not all current practices in Ophir fulfil RSPO criteria. The NESP Ophir project however appears to qualify for many of the principles and guidelines set up by the RSPO and an overview of the most important criteria is given in this section.

Ophir smallholders are currently not certified and it was not clear why they were not making efforts to become members. A possible explanation is that the PTPN VI factory and practices are not up to RSPO standards (e.g., burning empty fruit bunches) and therefore RSPO certification seems far away. Another reason might be lack of knowledge amongst smallholders about RSPO. It appears however that with few adjustments RSPO criteria could be met.

The Ophir projects strengths are its transparent and democratic structures in which the smallholders have strong control over their organisation and leaders. This can only function if there is a transparent system in place in which farmers can scrutinize activities. This transparency was also experienced by the researchers, indicated by apparently little concern for secrecy, which is often a sign of honest management. Organisational structures at different levels were helpful in providing information and appear to have clear knowledge on their members and physical conditions of the area. Also it is clear what the legal status of the land was, and that it is owned by smallholders themselves now as loans have been repaid. Therefore principle one of the RSPO criteria appears to create no obstruction for certification.

The legal structures in Ophir appear to be in compliance with the law and have full legal status. Criterion 2.3, on the diminished land rights and informed consent by local populations, is frequently highlighted by NGOs as these issues often lead to social conflict. In the Ophir project it appears that there was respect for the wishes of the local people reflected by the fact that the oil palm plantation did not become as large as the original plan because local residents objected and did not want to become oil palm farmers. The current Ophir plantation appears not to have any *adat* claims. Afrizal (2009) indicates there was an issue about land rights between the nucleus estate and the Kinali local community but this problem was resolved with financial compensation to the local community.

Some NGOs were concerned about the involvement of the military in this project and fear of local communities to protest against this. It is unclear to what extent this holds true. Afrizal (2009) indicates, however, that in West Sumatra local communities dared to stand up against military organisations after *Reformasi*. Therefore it appears that if the project involved military pressure, locals certainly would dare to stand up to relatively low ranking retired veterans in Ophir as well. The project created much employment and economic activity in the area and appears to have created many opportunities for locals, smallholders and labourers from outside the immediate project area (see box 6, Annex XVI).

Issues that could potentially hinder RSPO certification is the lack of clear plans for replanting (RSPO principle three on long term economic vision). Replanting is necessary soon for future production as trees are old but plans had not crystallized before our visit. During this research a workshop on replanting was provided and replanting plans do appear to materialize now. Related to this lack of replanting plans there are few continuous improvements in key areas of activities, (RSPO principle eight). This could hinder certification and these deficiencies are also indicated as threats for the project (Section 13).

During the setup of the project palms were directly planted next to the rivers and creeks. This is not in line with current best practices but can be rectified at replanting. Although Ophir farmers use relatively little pesticides compared with private sector estates, there is a need for training on the safe use of agro chemicals as this appears to be lacking. Empty fruit bunches are not used as a fertilizer substitute, which shows that there is space for improvement of best practices, as stipulated in Principle four of the RSPO principles and criteria.

Ophir smallholders appears to comply with most RSPO principles and criteria, and with adjustments, some which can be implemented during replanting, Ophir smallholders appear eligible for RSPO certification. There is clear information about the physical condition of the land, there appear to be no problems with land rights or local communities and no high conservation value areas were occupied at plantation establishment. Therefore it appears that there are no fundamental issues that hinder certification. Although there are clearly issues that need to be improved these issues do not seem unachievable, although maybe outside assistance might be needed and government agencies could assist in filling these gaps. A major problem, however, would be the practices in the PTPN VI factory, which appear to need fundamental changes. For a more detailed overview of all RSPO principles and the situation in Ophir see Annex XIV.

13. Weaknesses, threats and possible solutions

The NESP Ophir smallholders have been able to manage a smallholder palm oil plantation intensively for the past 25 years and the organisational structures still seem to function well. However, some threats to the sustainability of the project have been identified. The main threats in the project relate to replanting, implementation of innovations, maintaining social cohesion, and reduced emphasis on core activity (i.e., oil palm farming!). Although these weaknesses and threats should not be underestimated, they do appear resolvable, and some suggested solutions for these problems are provided.

13.1 Replanting and consumptive behaviour

A strategy for replanting was already in place in 1995, where 10% of gross income was set aside for replanting (GTZ 1995a). All smallholders have contributed to the replanting fund (IDR 100,000 per smallholder per month) but it was not clear at the time of the visit whether this fund is still functioning properly. In times when palm oil prices were low this saving scheme was temporarily halted. The replanting fund has, in some cases, also been used to provide credit to members and therefore, in the case of Plasma 4, contains only 20% of what members have contributed (Interview Plasma 4 leaders, 13-05-2009). Also at kelompok level it was noted that loans have been provided to members with money from the replanting fund. The replanting funds in one kelompok decreased in April 2009 from IDR 74 M to 72 M instead of increasing for upcoming replanting. The amount is by far insufficient to finance replanting for the 26 group members.

Replanting could be financed with loans secured with the collateral of the farmers' plots which are valued at between IDR 220 M to 140 M each and the leadership of Plasma 1 and KJUB have proposed to use the land certificates of all members as collateral for replanting loans. Although Plasma 1 leadership claimed this plan succeeded in their plasma, this plan was not supported by the farmers in other plasmas and from our survey in Plasma 1 we found that most land certificates are already lodged at banks, presumably to secure existing loans (Table 16).

Farmers in Ophir have been accustomed to high incomes for a long time and have accordingly adjusted their spending. Farmers also became attractive targets for bank loans as smallholders have a guaranteed income and secure collateral. Already in the early days of the project it was obvious that not everybody invested their new wealth in a sustainable manner. Some farmers spent their money wisely whilst others did not. Also *kelompoks* provide low cost credit to group members and members regard this as a good practice, without too much concern for the future.

Table 16 Location land certificates according to smallholders (source: Own survey, 2009)

	Location of land certificate (%)			
Plasma	Plasma leadership	Bank	House	KJUB
1	30	48	22	
2	12	33	53	
3		88	12	
4		52	44	4
5		67	33	
Total	9	58	26	1

In one kelompok surveyed the interest charged on loans to members was below the rate of inflation at 1% per year and probably encourages farmers to take out unnecessary loans. Such poor control over credit might put the Ophir project in jeopardy when incomes from palm oil decrease, e.g. due to low oil palm prices or the need for replanting. Some smallholders with large debts might default with parallels to the sub-prime mortgage crisis in the U.S (Annex X illustrates that some members

only receive 25,000 IDR and these members are very exposed should income from the *kebun* decrease suddenly).

Dr Afrizal and a West Pasaman agricultural department official (pers. comm., 21-04-2009) indicated that the high level of consumption is likely to explain the fear smallholders have for replanting. Smallholders indicate that replanting is not yet necessary (see Table 9) as they fear the immediate financial consequences of decreased income. This fear halts the necessary activity of replanting and thereby jeopardises the sustainability of the project.

In the survey several smallholders indicated they were looking for another *stepfather,* meaning a company that would provide funds for replanting. They would later pay these funds back, just as in the beginning of the project. This could be a solution, but will not solve the problems of some members' financial mismanagement.

13.2 Lack of innovation

With so much success over the past 20 years perhaps the Ophir farmers have become complacent. At present there appears to be a lack of innovation as farmers are comfortable with their income and organisation. There are, however, clear indicators for lack of innovation:

- Computers have not been updated (in the 1990s farmers were very well equipped with up-to-date equipment purchased with their own funds).
- No internet connection or possibility to email the Ophir organisations and only one or two fax machines within the whole Ophir organisation (in Plasma 1 and perhaps one in KJUB). This in spite of the obvious benefits that internet connection provides (e.g., cross checking CPO and fertilizer prices).
- There were no initiatives to obtain information or training on the latest developments in oil palm management.

The most worrying indication was the limited knowledge within the plasmas concerning approaches to replanting and what materials to use. Some farmers favoured replanting techniques that are not suitable. During our second visit to the Ophir project, we were invited to address a workshop on replanting which was attended by about 80 smallholders, including leaders from the other plasmas. Smallholders actively participated in the workshop and appeared concerned and interested in the information and advice provided. Since the workshop, farmers have started to prepare for replanting (to be completed in each farmer group starting in 2011 over two years using seed from Lonsum). All plasmas are actively looking for land to develop new oil palm plantings for farmers' family members but the investment required is large and it appears that replanting funds may be used for this purpose.

13.3 Maintaining social cohesion

The 'togetherness', or sense of '*gemeinschaft*', was repeatedly mentioned by smallholders, plasma leaders and former GTZ staff, as a core feature of success in the Ophir plantation. Although the importance of the social cohesion was frequently expressed, so were worries about maintaining it. Different actors indicated that maintaining unity is a serious challenge in the project and social cohesion appears to be under threat by several developments:

- Increasing wealth leads to less interdependence. Smallholders invest less time in social activities in Ophir and participate less in the farmers' organisation as other activities are prioritized.
- Since plantation work is mainly carried out by labourers, smallholders now have less common activities meet less frequently. Plantation activities become more a matter of book-keeping and the focus on farming has decreased.
- Less social cohesiveness when farmers no longer reside in the plantation. At a micro scale this especially refers to people leaving Plasma 3 and 4 and moving to Simpang Empat or Simpang

Tiga, at meso scale moving to regional centres such as Padang, Bukitinggi and a macro scale moving out of the province. Absenteeism was particularly common in Plasmas 3, 4 and 5 where up to 60% of farmers were absent (interview Plasma 3, 11-05-2009). Plasma leaders indicated that only 5% of the smallholders really live outside the area, and that most people still live in the area.

- Decreased awareness of importance of group dynamics. Although our survey indicates there is still training in group dynamics, it might be that the core of the project, solidarity, is forgotten by a second generation smallholders. They were not involved in the intensive training on group dynamics and the importance of solidarity, and therefore might be less aware of the need of social cohesiveness.
- Newcomers to the project might also have a different approach to the project and see it as just as a rent-seeking opportunity. On several occasions it was noted that outsiders take less responsibility in group activities (interview Plasma I, 08-05-2009; pers. comm. Ophir villagers, 13-05-2009). Participation in plantation management, social activities and face-to-face contact between members decreases with these newcomers who appear unaware of the core values of the project which led to its success. This is also relevant for children who inherit plots and maintain it under one name whilst all live outside the area. There might be less commitment by second generation landowners towards the group system.

The threats to social cohesiveness may influence the trust smallholders have in the farmer organisations. Although during fieldwork trust still appears to exist, there are also indications that trust in the project is diminishing. The management teams of several plasmas indicated that some Ophir smallholders want to manage their plots individually, without the shared incomes and Ophir structure. A former GTZ leader indicated this would not have happened 20 years ago, as the biggest fear then was being expelled from the group system (Klaus Dieter Peters, pers. comm., 18-06-2009).

Plasma 4 management indicated that the percentage of people that want to leave the structures might be as high as 25% (interview, 13-05-2009). The chairman of Plasma 5 indicated that he paid a visit to two members who wanted to leave the system the day before and had to convince them of the advantages to stay within the system (interview, 13-05-2009). This expressed desire of wanting to leave the organisation appears an indication that a substantial proportion of farmers no longer trusts its leadership or understands the strength of the principles of the project. The *ketua kelompok* and plasma leaders have a role here in demonstrating the necessity and benefits of the group system. This is certainly important with replanting which requires a joint effort that plot owners cannot manage effectively as individuals.

13.4 Conclusions on threats and possible solutions

There are several threats to the long-term sustainability of the project and these threats become more explicit as replanting is due. The major strengths of the project are its grassroots control and the functioning of democratic structures, which maintain tight control over activities and maintains the commitment of smallholders. The organisation is lead by smallholders who approve ideas which they believe to be in their best interest. This avoided a common problem in previous schemes; disinterested smallholders as a consequence of non-compliance to their needs. However, this also has a downside as decision making always needs to be understood by members as their support is needed to carry out plans. Not all members have the same educational background or interests and therefore the democratic processes might take longer and is more complicated than technocratic management.

The participatory system requires strong leadership with up-to-date knowledge and access to knowledge on plantation management that can provide clear strategies to their members for short and long term planning. Strong and capable leadership also includes convincing members of the need for measures which on the short time might be unpleasant but are necessary for long-term sustainability. It appears that leadership in Ophir might have slipped behind in innovations and long-

term planning due to pressure for short-term demands of smallholders and prolonged periods of prosperity in which unpopular decisions appeared unnecessary.

The principles of the project, e.g. need for 'togetherness' and group rationale, might have eroded as new people joined, children took over from the first generation settlers and the role of smallholders changed due to economic progress of many smallholders. Therefore it might be necessary to have new kinds of training on project philosophy, rights and obligations, and group dynamics. These trainings should be a continuous process that keeps adapting to changed circumstances.

Smallholder leadership has an important role in maintaining members' consciousness of the advantages of the group system and its rationale. Replanting provides an opportunity to revitalize the group system and demonstrate its value. It will be much more difficult for individual farmers to replant their plots than to replant a farmer groups' plots by managing the block as a single management unit.

It also appears plasma leadership and in particular the KJUB, by own initiative and pushed by smallholders, has engaged too much in side activities such as credit schemes, new plantations and shops, such that less attention is paid to the core business activity that supports all members. Side activities also increase the possibility that trust between farmers and organisations is eroded when side business activities run in to problems.

Although there are clear threats, and underlying reasons for them can be identified, these problems can be mitigated. Measures that could to be taken include:

- Refocus on core activities and not engage in too many (sometimes risky) activities which dilute the original intentions of the smallholder setup, which is to manage an oil palm plantation. With this focused view on oil palm management more attention can be given to innovations and sustainability of the plantation.
- Maintaining an innovative approach to plantation management might be stimulated by yearly audits by outside experts to establish to what extent the organisations are functioning optimally and what needs to be improved. The results of these independent audits could be made available to all smallholders.
- Stronger communication to members and training for plasma leaders on how to convince members of necessary but unpopular measures. Members and leaders have to take tough decisions on members who jeopardise the viability of the plantation. Tough choices might relate to high indebtedness of some members and not providing extra credit and in worst cases sale of land. This can be best arranged when all land certificates are kept in the plasma or the Ophir Bank, which at the same time will reduce possibilities for illegal plot sales.
- Organize social activities that support group cohesiveness, and highlight the necessity and functioning of their group system (if members do not want to participate then fines can be applied). Perhaps also compulsory *kelompok* meetings should be held once a year in which all members must be present or incur fines.
- Update of fine systems so that fines stimulate people to take action (current penalties are probably too small at IDR 50,000 - less than the cost of fuel from Padang to Ophir). This also taxes rent-seekers who still do not participate in group activities and have little commitment to the project.
- Better procedures to ensure that funds deducted for a particular purpose are not used for other purposes.

The present replanting phase presents a major challenge for the Ophir project but also an opportunity to show the value of the organisational set up. This new situation can also serve to readjust and strengthen the system as smallholders realize there is a need for adjustment, which is a driver for innovation. Leadership has an important role in maintaining the trust of smallholders in the project and the plasmas will have to work hard on this. Although there are clear threats to the project it appears that these can be overcome.

14. Conclusions

The NESP Ophir project is characterized by two major success factors: good natural conditions and well designed organisational structures. The excellent natural conditions include fertile soils, suitable rainfall and sunshine hours for oil palm (Section 6). The organisational structures were set up 27 years ago with the assistance of GTZ, and still appear to function well. GTZ activities ceased in 1996 and smallholders proved able over the subsequent 13 years to sustain an independent and self-reliant farmer organisation which maintains high average yield over a prolonged time period.

Section 11.2 on plantation agronomy demonstrates that the overall average yield by Ophir smallholders over the period 1985-2009 is 24.4 t ha^{-1} during which time the Ophir smallholders outperformed the nucleus estate, which had an average yield of 18.7 t ha^{-1} (see figure 11). Smallholder yields were greater than many leading oil palm plantation companies. As smallholders had no experience in growing oil palm and the political climate was hostile to self-reliant farmers at that time, this is a remarkable achievement.

The smallholder organisational structure is based on the solidarity and subsidiarity principle, in which there are three layers of management (figure 7, Section 10.2). At the lowest (grassroots) level the 2,400 smallholders are organized in 102 farmer groups each of about 50 ha. Income from oil palm in each group is shared between members such that there is a high degree of mutual self reliance. Each farmer group has set up a system of fines to help enforce high standards of plantation management.

Smallholders received extensive training on technical issues, managerial issues, group dynamics and understanding of project principles, (Section 9.2). Training aimed to create *gemeinschafts* (or communities) in which social and managerial activities go hand in hand. Even today farmers often refer to this *togetherness* as a core tenet of the project. Smallholders correct each other through a combination of peer pressure and fines and do not tolerate members who neglect their plots. Although individual members have to arrange that the work in their *kapling* gets done and are fined if it is not, it is the group that carries the responsibility for the maintenance of the complete *kelompok*. Group leaders, who are democratically elected from the members, organize activities such as plantation management, fertilizer application, and labour if work is not done by individual members to the required standard.

For activities which grassroots organisations cannot manage, five primary cooperatives were set up to facilitate the farmer groups and a secondary cooperative to manage necessities for the whole plantation and represent smallholders to third parties. The smallholder organisational structures are set up in such a way that the management is accountable for their actions to the smallholders, which demands justification from their leaders.

This system functions best at the lower levels (farmer group and plasma), where farmers can check management directly. At the secondary cooperative level there is indirect control by smallholders through the primary cooperative and therefore this organisation is more distant from the membership. It appears recommendable to keep responsibilities at the lowest level possible, so that there is critical and direct control over activities.

There is a range of diversity within the project, in natural as well as organisational conditions. The natural conditions in the western, lower, parts of the plantation (Plasma 1 and 2) are more favourable compared with the eastern parts (Plasma 3, 4 and 5), which are located towards Mount Talamau. These favourable conditions include longer periods of sunshine, flat areas with better soil texture, and thus yield potential is higher in Plasmas 1 and 2.

Beside natural conditions another compound of reasons for differentiation within the project is the setup of the smallholder organisations. Plasma 1 and 2 were developed first and served as examples for the success of the plantation. At later stages it appears the project became associated with some of the usual problems in PIR schemas, such as reduce commitment of implementing agencies, reflected in longer conversion periods, poorer planting material, and poor infrastructural development and housing facilities.

Also there is a difference in background and attitudes of settlers (Section 8.8), larger distance between house and field, and more isolated position from local centres and main road (see Annex I). These factors are likely to have contributed to increased absenteeism and poorer functioning of the group system, hence decreased faith in the organisational setup. It is difficult, however, to determine to what extent natural conditions or managerial issues are responsible for yield variation within the project. Although there is internal variation with more handicaps in Plasma 3, 4 and 5, even the least productive plasma had an average yield above 22 t ha^{-1}, the group system still functions in all plasmas and the majority of the people seem to be content with the system. It appears that profitability and commitment to smallholder organisations go hand in hand.

The Ophir system has substantial advantages compared with the KKPA system and individual smallholders (Section 11.6). The Ophir structures provides smallholders with the advantages of structured planning and execution of tasks, a mechanism to maintain high standards and organized provision of knowledge and high quality inputs. These advantages were clearly lacking in the individual smallholder fields and resulted in low yields. Although the KKPA system provides organisation and inputs, it is unlikely to obtain the efficiency of the participatory Ophir system. In KKPA schemes labour is organized anonymously, as in any private estates, and there is not the commitment and tight (social) control in place which is needed for maximum production. Ophir farmers have consistently out-performed the PTPN VI by a large margin over the past 25 years (Figure 11).

Smallholders in KKPA schemes are not dependent on each other as the company supervises activities to reach a certain standard and thereby take away responsibility from smallholders. Therefore, KKPA smallholder schemes are really extensions of company activities and are not aimed at utilizing the advantages of participatory organized smallholders. As the benefits of smallholder collaboration and control are not applicable anyway it does not matter who is the owner of a plot. KKPA systems therefore become susceptible to rent-seeking activities in which regional development is not stimulated at all as the profits flow out of the region, just as in private sector estates. This is less likely in participatory smallholder structures as smallholders want to maintain high production and do not accept rent seekers to undermine this by not contributing to group responsibilities.

The impacts of the Ophir project on the local situation in West Pasaman appear huge. The Ophir project increased livelihood opportunities for many people who, directly and indirectly, profited from the large proceeds made by smallholders. Although it is obvious that the Ophir project functioned as an engine of development in West Pasaman, it is impossible to indicate precisely how much is due to the project and how much to other developments.

The nutritional intake in the Ophir project area improved due to increased economic activities and no increase in nutritional intake was apparent in the reference area outside the direct vicinity of the project (section 11.5). The strongest impact the project has had appears to be the leading role it played in later oil palm developments in West Sumatra, which exploded in West Sumatra in the 1990s. Ophir is often used as an example of the potential wealth that oil palms can deliver.

There is currently little awareness or interest by smallholders to apply for RSPO certification. The Ophir structures include transparent and democratic management and there appear no problematic issues between smallholders and local populations. At some point compensation was paid by the nucleus estate to local communities for a piece of land the nucleus had taken without consent of local populations that was reclaimed by the local populations. No primary forest or other High Conservation Value land was cleared for the project and most criteria would not cause problems for certification.

The principles most likely to create obstacles for certification are principle three, on long term economic vision, and principle eight, on continuous improvement of practices. The lack of adherence to these principles appears to be related to threats to the project and might also explain the lack of awareness of RSPO with Ophir smallholders.

Although the project has been successful over a prolonged period, the project has reached the critical phase of replanting as palms reach the end of their productive lives. There are several threats

to the long-term sustainability of the project and these threats become more explicit with the critical event of replanting, which will have a large influence on the incomes of farmers.

The major strengths of the project are its grassroots control and functioning of democratic structures. This also means, however, that leadership should convince its members of necessities and it appears that leadership slipped behind in creating clear long-term strategies and convincing its members of the implementation of these strategies. Instead of focusing on innovations and strategies for long-term viability of the plantation, smallholders appear to have focused on side activities such as credit schemes and other (risky) business activities, and projects with short-term benefits.

Although there are emerging problems, these do not disqualify participatory smallholder management. Replanting may well be an opportunity to readjust current practices, and update regulations and practices which need to be adjusted to the new realities within the project. Some measures which could be taken to strengthen the project are noted in Section 13.4. The coming years will be a very interesting period to see whether the Ophir structures set up more then quarter of a century ago will be able to survive this critical event and whether the self-reliance of farmers has truly been developed in such a way that smallholders can overcome this phase and thereby fully complete a whole lifecycle of an oil palm plantation. The replanting might not only be a threat but also an opportunity to strengthen social cohesion again, bolster the self-reliant farmer structures and prove that even this problem can be solved by smallholders. The Ophir project certainly provides valuable information on setting up smallholder activities, the strengths of smallholder participatory systems, the weaknesses of the system and also provides indications on how to improve this system.

15. Recommendations/ guidelines

In this section we provide some guidelines for successful smallholder development based on lessons learned during this study and RSPO criteria. Some of these issues are already highlighted in Annex II.

15.1 Land

- Identify land that meets RSPO criteria:
    - Focus on degraded land evidenced by satellite imagery shots taken at 5-10 year intervals and above ground biomass assessments.
    - Ensure that land was acquired with the free, prior and informed consent of local people. Landownership is a highly complex issue in Indonesia as there is much debate traditional landrights vs. formal landrights and even between various governmental offices there are competing claims on land.
    - Avoid plantation development at peat soils.

- Calculate carbon payback time based on yield assumptions and biomass displaced at planting and develop sites where carbon payback time is less than one planting cycle (i.e., <25 years). Sites carrying a small amount of standing biomass provide opportunities to develop oil palm plantings with short ecosystem carbon pay back times.
- Farmers should be provided with a land title once they have completed loan repayments but the certificate should be deposited in trust with the bank at the start of the loan.
- Plot size should be adapted to (potential) income so that reasonable incomes for families (and farmer groups) are feasible. This mean that plots (or land of a group) with poor conditions might have to be larger than plots with optimal conditions. However, very productive oil palm plantings can be established on low fertility status soils in Indonesia provided proper techniques are used to establish the crop.
- Home plot areas are important for farmers for food security during the first few years after occupying their plots and are recommendable. As oil palm income increases with repayment of loans, home plot can be used to diversify farm income (e.g., tree crop production or fish ponds in Ophir). Home plots are a basic insurance for times of low palm oil prices, the size of a home plot in Ophir is 0.5 ha and this appeared sufficient.

15.2 Plantation establishment

- Follow RSPO guidelines on plantation establishment (requirement for buffer zones along rivers, HCV identification, demarcation and preservation).
- Use data base and GIS system to monitor all agronomic and environmental issues for each farmer group. This provides a basis for benchmarking performance.
- On degraded land Ultisols (red-yellow podzolic soils), invest in soil fertility recapitalization with reactive rock phosphate and legume cover plants to restore soil fertility and ensure short time to maturity and large early yield.
- Use of high quality identified planting material is important. Recommendable providers of high quality indentified planting material in Indonesia are Lonsum and SOCFINDO, otherwise we recommend imported seed from Dami (PNG) or ASD (Costa Rica).

15.3 Plantation Company

Full commitment to a partnership relationship with the smallholders is a prerequisite for genuine smallholder development. The nucleus estate company is responsible for plantation establishment and farmers should then take over plots when a farmer group area is ready for harvest. Key indicators for genuine smallholder developments include:

- Ability to bring new plantings into production in 24-30 months.
- Yield in 3-7 years after planting (because early yield is key driver of IRR).
- Transparency on cost of development (USD ha-1 from land clearing to maturity).
- Transparency on cost of production (USD t-1 palm product).

15.4 Smallholder selection

- A set of criteria to guide the selection of smallholders is required. In this selection it is advisable to keep out participants who merely see a smallholder plot as an investment and to include people who are likely going to be active members in smallholder organisation and invest time and effort in their plantation. For more on selection criteria in Ophir see section 8.8.
- A feature of the Ophir project is the diversity of backgrounds amongst farmers, which included people with different ethnic and occupational (economic) backgrounds. This meant the project could draw on a wide range of experience to fill key positions in the farmers' organization and no single ethic background dominated the development of the farmers' organization. This diversity appears to have strengthened the organisation and therefore we recommend including diversity in smallholder selection. Consideration has to be given however that people are not mixed bluntly and culturally sensitive issues are taken into consideration.

15.5 Extension services

- Extension services are responsible for training farmers on best management practices in oil palm cultivation (suitable handbooks, training, monitoring and evaluation).
- Extension services may be supplied initially by the government , a qualified NGO working under contract to the government and/or the private sector plantation development company (the investor). When it is the private sector who provides extension services there needs to be considerable knowledge, and preferable experience, in setting up proper extension services. Many oilpalm companies however have set up their own extension services, although not all of these extension services might have been capable to properly support smallholder development.
  In the Ophir project GTZ was the qualified NGO providing extension services to smallholders under contract with the Indonesian and German governments (who in this case might be regarded as the investors). However, GTZ also worked together with government extension services who were trained by GTZ and who aided in transfer of GTZ knowledge to smallholders. This was agreed at the outset of the project and should be clear before starting a project. GTZ also hired outside experts from institutes as the Bogor Agricultural University (IPB) for special tasks. It was clear however that GTZ was responsible for the organisation of proper extension services. It is likely that organisations as GTZ still possess the knowledge and capability to organise proper extension services.
- Initially extension services should initially be supplied by government, NGO and/or company (investor). These extension services should however also focus on the development of smallholder capacity to manage their own extension service, as in the Ophir project.
- Smallholders should be involved in setting up the farmers' organisation from the outset.
- In order to establish viable self-reliant smallholder organisations there need to be trainings on technical, administrative as well as social aspects. This certainly includes trainings on

rights and obligations, and making farmers understand the rationality for the establishment of rights and obligations and why to follow the agreed procedures.

- Farmers need to have a high degree of trust and confidence in the farmer organisation and the partner milling company in order to make a smallholder project function. This does not happen without intensive training over a period of at least five years.

15.6 Government services

- From the outset it is important to plan with full local government involvement the requirement for infrastructure (roads, police, medical services, schools, markets) so that there are opportunities for a community to develop, and a means for local farmers and service providers to trade with smallholders for goods and services.
- Banking services are required to process payments made by the milling company and accredit repayments made by farmers.

15.7 Plantation management

- Irrespective of the type of farmers' organisation model, farmers require services including crop transport, provision of inputs (fertilizers, tools, and agrochemicals), and pest and disease control.
- Clear rights and responsibilities for stakeholders. These should be agreed upon by smallholders in democratic processes in which the smallholders themselves understand and value agreements. This is necessary for having committed smallholders.
- The RSPO criteria for plantation management should be followed, these include:
    - Use of appropriate best practices by growers and millers which includes issues as recycling of crop residues (smallholders should recycle proportional amounts of empty bunches and decanter cake) and soil erosion control measures.
    - Demonstrate commitment to long term economic and financial viability. This includes timing of replanting (i.e., 25 years after plantation development or when the distance from ground level to bunches is >12 m, whichever occurs first) and possibly having yearly outsiders assess ongoing practices and provide advice on possible improvement points and latest techniques.
    - Implement clear procedures in which complaints from smallholders and local communities can be dealt with.
    - Stimulate best practices as correct procedures, up to standards storage and disposal depots for (legal) agrochemicals, save working conditions and monitor this (maybe irregular checks). The implementation of these best practices might be facilitated by providing smallholders with a financial incentive.
- Third party labour is likely to be included in a plantation when smallholders have increased their wealth. In Ophir this happened already soon after the start of the project and there was little regulation in place concerning organisation of labourers and these labourers did not receive formal training. In future projects it might be advisable to have procedures in place for labourers which include proper trainings by primary or secondary cooperative. Also it needs to be arranged that smallholder (organisations) provide correct working tools and conditions for labourers. This can also be arranged with providing a financial incentive.
  In areas which are more remote and there is a shortage of labour it might be more important to set up proper procedures for attracting and housing a skilled workforce which works under safe conditions for a fair wage.

15.8 Financial management

- A transparent payment system similar to the Ophir Amprah (Annex IX and X) is required. This systems shows how price is calculated, gross proceeds, lump sum deductions made to meet approved budgeted costs of fertilizers, road maintenance, pest and disease control, replanting, etc.. Pro rata deductions (USD/kg) for transport costs appear to function well.
- Stabilization schemes have been tried in smallholder schemes but found to be inefficient or difficult to implement. In most schemes, farmers are paid based on a pricing formula that takes account of world crude palm oil and kernel prices, milling efficiency and proximity to markets.
- When smallholders have just entered a project usually their financial position is fairly weak. Therefore a grace period should be implemented, meaning that smallholders do not start repaying their loan immediately but start repaying after a certain period. Grace period between handover of plot to farmer and start of loan repayment is desirable in order for smallholders to establish financial security and thereby create commitment to the project. In Ophir a two year grace period was in place, but this period should not be predetermined to dogmatically as price fluctuations influence the possibilities of farmers to repay.
- Rate of loan repayment in Ophir was 30% of gross proceeds and appears to have worked well. However, also here we recommend adjusting loan repayments to repayment capacity of smallholders, which is influenced by palm oil prices.
- With a huge increase in the number of processing mills in Indonesia, farmers have much more opportunity to sell crop to the highest bidder, as is happing in Thailand. This leads to poor quality palm fruits as farmers can sell to many plants. Therefore consideration should be given to include smallholder participation in mill, possibly as shareholders. This might increase smallholder commitment to keep selling to mill and stimulate the smallholders to harvest ripe crops with high oil extraction rates. More research on implementation and effects is needed however.
- Group structures in smallholder organisations are recommendable to avoid individual smallholder sales to other mills.

15.9 Smallholder organization

- All smallholder schemes should meet basic criteria for successful oil palm cultivation defined by Goldthorpe (1994; 1995) (Section 5).
- Several different organisational models are possible, each with advantages and disadvantages:
    - Low level of farmer participation and responsibility (e.g., KKPA) where company manages the plantations and the farmer is paid a dividend and has limited influence on how the plantation is managed (e.g., level of input use). Simpler to manage but less impact on regional development.
    - High level of farmer participation (e.g., Ophir project) with farmer organisation taking responsibility for roles otherwise carried out by company (crop transport, supply of inputs, administration of payments). More difficult to set up but greater impact on regional development. For an overview of the organisational structure of the Ophir project see figure 7.

- Farmers achieve more efficient plantation management when working in groups. Group size of 15-20 farmers where each farmer owns 2 ha results in management units of 30-40 ha, similar to management unit size in estates.
- The Ophir model, where revenue is shared amongst members of each group, has distinct advantages in terms of facilitating solidarity and peer pressure amongst group members, and thereby uniform standards of plantation management.
- Farmers live in a village spatially separate from their plantation to promote community development and reduce cost of developing housing, road and related reticulation.
- Financial management at primary cooperative level should be set up to achieve maximum transparency with easy auditing and paper trails.
- Lessons from Ophir indicate that smallholder control on management is most direct at the lower levels of management and that the highest level of management has least direct control by smallholders. Therefore it appears recommendable that payments of mill to smallholders take place via the primary cooperatives, leaving the secondary cooperative out of financial issues as much as possible, and thereby decreasing possibilities for mismanagement.
- Secondary cooperative function should be restricted to representing smallholders to outside organisations (the milling company) and setting policy that applies to secondary cooperatives. Secondary cooperative should probably not operate business activities and process farmer payments but should provide services where this can be done more efficiently than primary cooperatives.
- Setup of a transparent system for exit and entry to the scheme is important. The system in Ophir appears to work quite well where farmers can sell their plot and house and prospective buyers must be approved by the farmer group before a sale is made. In the Ophir project a sensible rule prohibits an individual farmer from owning more than one plot.
- Inheritance rules should be in place as part of entry strategies. In Ophir this happens according to the (Suami, Istri, Anak) SIA principle which implies plot is inherited from man to wife and finally a child inherits the land from the wife. Plots cannot be split amongst children and can only be registered to one owner in order to avoid fragmentation and unclear landownership. In the project administration there is always only one owner of a plot of land and this is the person that has responsibilities towards group management. In practice however families might divide profits and responsibilities differently. Plots can of course also be sold.

16. References

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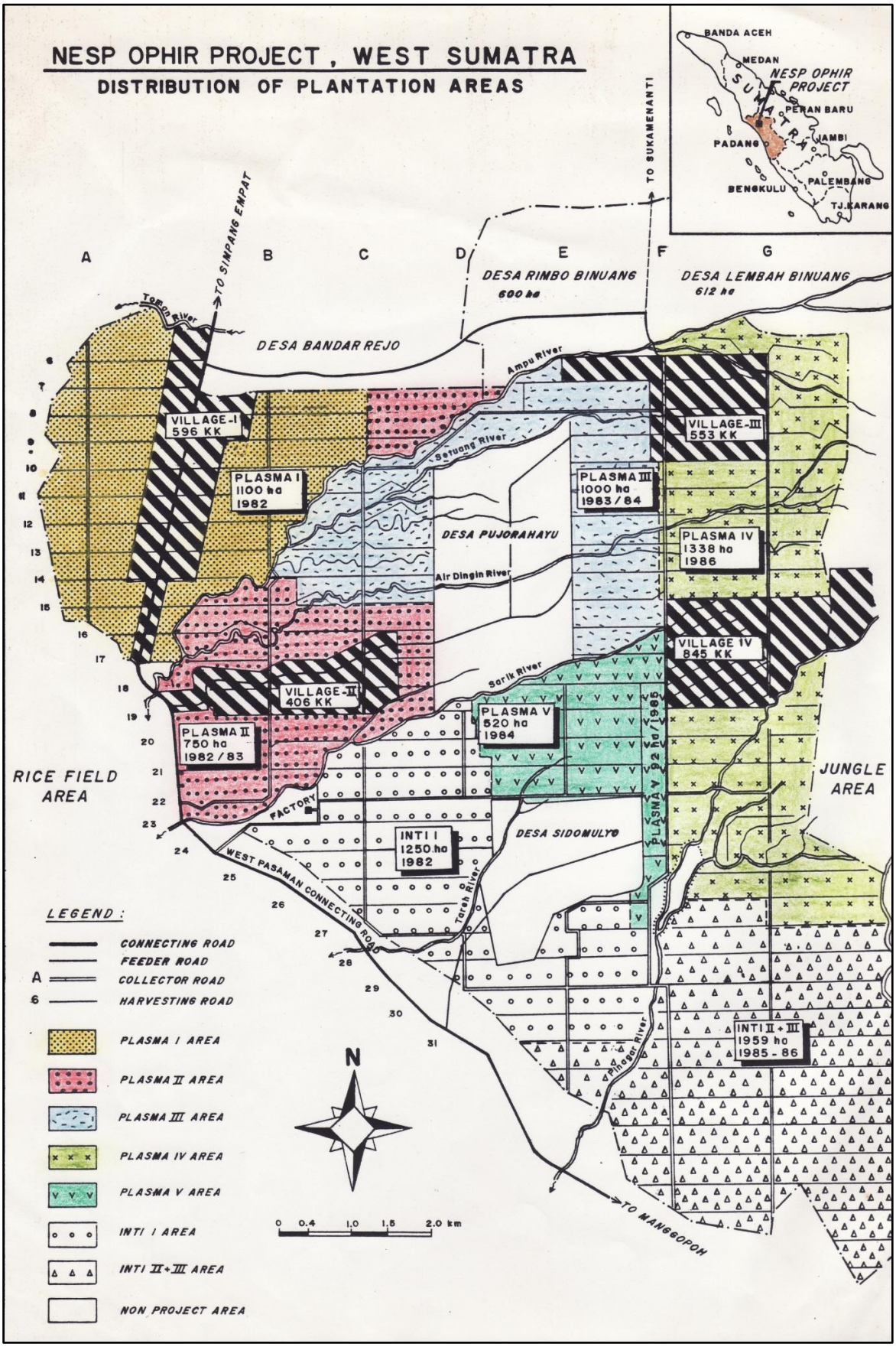
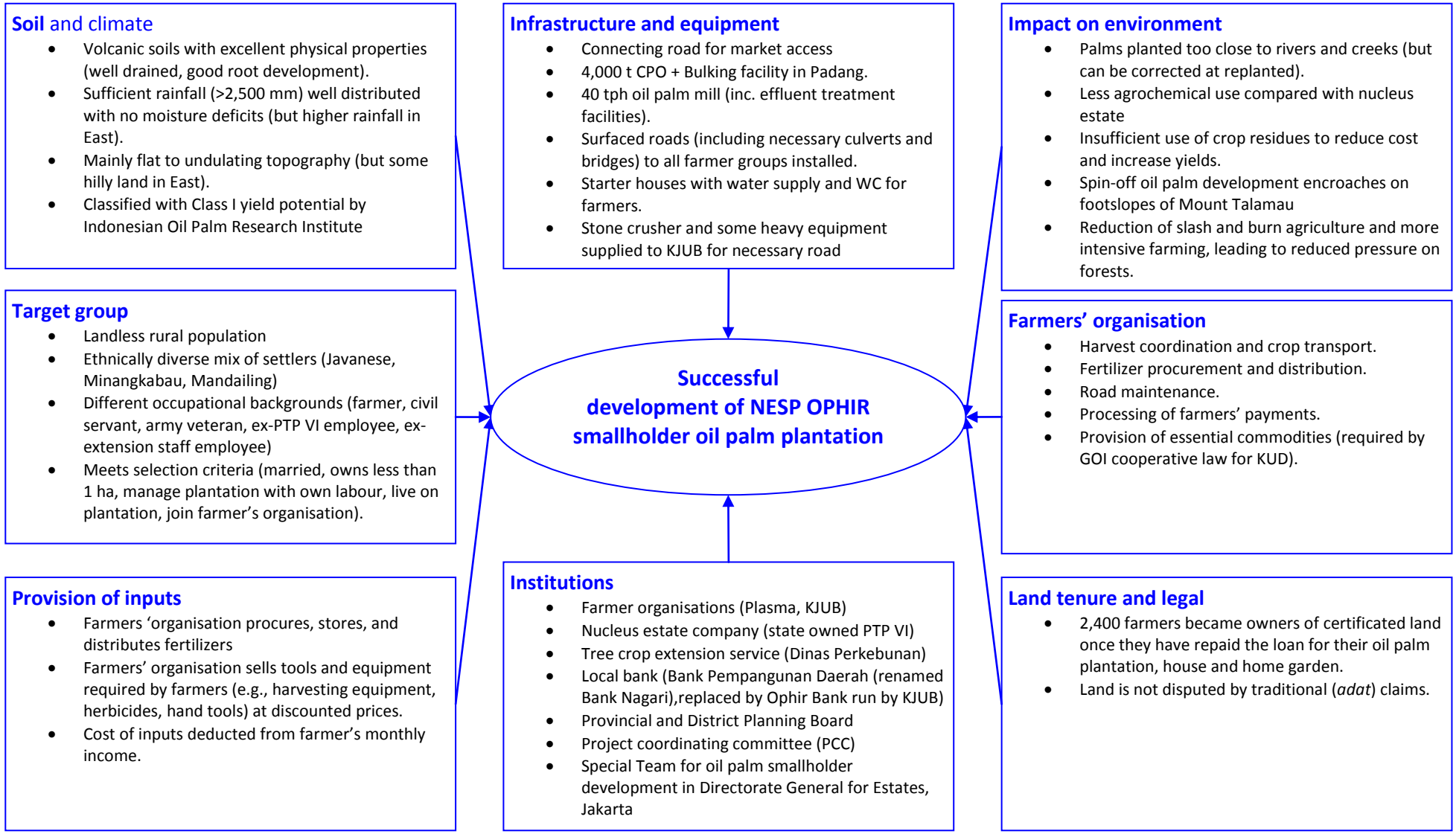
Annex I. Map of NESP Ophir showing location of plasma and nucleus



Annex II. Key factors contributing to the success and sustainability of NESP OPHIR



Annex III. Two models of smallholder oil palm development in Malaysia and Papua New Guinea

1. **FELDA (Federal Land Development Authority), Malaysia**

FELDA was established with the purpose to help the government carry out rural land development schemes and to uplift the economic status as well as living standard of the rural community. The first scheme at Lurah Bilut was planted with rubber in 1958, and Taib Andak, planted in 1961, was the first FELDA scheme planted with oil palm. The scheme now comprises 721,875 ha of which 80% is planted to oil palm.

Settlers were drawn from rural Malay poor aged between 21 and 50 years, married, and physically fit. Priority was given to those who did not own any farm land. New settlers were assigned to a particular settlement, and allocated 4.1-5.7 ha land to cultivate with either rubber or oil palm. Settlers were required to reside at the settlement itself, and were allotted 0.1 ha in a planned village where a house, built by FELDA, was provided. Piped water, electricity, schools, medical centres, and places of worship were also provided under the scheme. **Originally, FELDA schemes were designed as cooperatives where, instead of each settler owning a defined piece of land, settlers held an equal share in the ownership of the particular scheme. However, the settlers objected to this arrangement since negligent farmers benefitted and were not penalized.** The government then set up a 3-phase plan where, in the first phase, the co-operative provided a mechanism for the settlers to learn how to farm. In the second phase, each settler was given a specific plot of land to work, and in the third phase, he was given the land title to that plot but the settler was forbidden from selling the land without permission from FELDA or the federal government. The costs of acquiring, developing and allocating land were transferred to FELDA settlers in the form of bank loans. These loans were repaid in monthly instalments deducted from the settlers' income over a 15-year period. About 20% famers carry out all the field work themselves but >50% employ foreign workers to carry out upkeep and harvesting work. FELDA is now promoting mechanization (fertilizer application, in-field crop transport) and improved methods of Ganoderma control and replanting. Settlers are required to join the FELDA Investment Cooperative which provides loans for various purposes.

2. Land Settlement Schemes (LSS), Papua New Guinea (PNG)

The goals of the LSS, established in PNG in 1967, were to diversify the economy, increase agricultural export earnings, improve rural incomes by involving Papua New Guineans in cash crop production with individualized land tenure, relieve population pressure by voluntary resettlement and develop under exploited land.

The World bank recommended that oil palm be developed in a nucleus estate smallholder model with smallholder settlements located around and supported by a central nucleus estate jointly owned by the government and a private company (Koczberski, Curry et al. 2001). The company was responsible for managing the estate plantings, establishing and operating a processing mill, marketing, and providing smallholders with planting material, technical advice and processing facilities. In the Hoskins Scheme on West New Britain, each farmer was allocated 6-6.ha land under a 99 year lease with 4 ha planted to oil palm, and the remaining area reserved for food gardens. Between 130 and 320 blocks were grouped in administrative subdivisions, each with a central community centre containing a primary school, health centre, agricultural extension office, designated market area, stores and recreational facilities. Loans for house building, oil palm seedlings, tools, land rent and to cover living expenses while waiting for the first harvest were provided by the Papua New Guinea Development Bank (PNGDB) with loans from the Asian Development Bank.

Indigenous landowners in the Hoskins area also encouraged local villagers to plant 2-4 ha of oil palm on their own customary land as Village Oil Palm (VOP), but most have planted only 2 hectares with loans from the PNGDB. In the early years, LSS farmers achieved much higher levels of productivity but over the past ten years, productivity in VOP farmers has improved.

Annex IV. Comparison of margin over cost (BMZ 1992 and this study)

Parameter (IDR in '000)	Nucleus	Plasma	Corrected plasma 1991 price levels	Plasma	Plasma change	Share of revenue	
	1991	1991*	1991+	2008	1991+/2008	1991	2008
Yield (t ha^{-1} fruit bunches)	20	25.6	25.6	23.4	0.92		
Yield (t ha^{-1} crude palm oil)	4.5	5.8	5.8	4.9	0.84		
Price (IDR/t fruit bunches)	120	120	767	1710	1.79		
Revenue (IDR/ha)	**2,400**	**3,072**	**19,630**	**32,253**	**1.64**	**100%**	**100%**
Revenue (USD/ha)	**1,200**	**1,536**	**1,969**	**3,235**	**1.64**		
Compound fertilizer	-	-	-	3,781			
Urea	82	82	-	-			
TSP	57	57	-	-			
KCl	101	101	-	-			
Kieserite	80	80	-	-			
Borate	13	13	-	-			
Total Fertilizer (IDR/ha)	333	333	2,128	3,781	1.78	11%	12%
Pest and disease control	15	15	96	160	1.67	0%	0%
Supervisory costs/management fee	10	26	166	680	4.09	1%	2%
Road maintenance	50	65	415	260	0.63	2%	1%
Crop transport	80	104	665	910	1.37	3%	3%
Other physical costs	24	27	173	250	1.44	1%	1%
Labour costs (incl. harvesting)	214	80	511	2,048	4.01	3%	6%
Total variable costs (IDR/ha)	**727**	**650**	**4,154**	**8,089**	**1.95**	**21%**	**25%**
Total variable costs (USD/ha)	**363**	**325**	**417**	**811**	**1.95**		
Gross margin excluding family labour	1,673	2,422	15,476	24,165	1,56	79%	75%
Family labour input (IDR/ha)×	-	120	767	578	0.75	4%	2%
Gross margin including family labour	1,673	2,302	14,709	23,587	1,6	75%	73%
Land tax (IDR)		13	80	100	1.25	0%	0%
Net farm income per ha (IDR)		2,409	15,396	24,065	1.56	78%	75%
Net farm income per 2 ha smallholder farm (IDR)		**4,819**	**30,792**	**48,129**	**1.56**		
Net farm income per 2 ha smallholder farm (USD)		**2,409**	**3,088**	**4,827**	**1.56**		
Variable costs as % gross revenue	30%	21%	21%	25%	1,19		
Cost of CPO production (IDR/t)	161	135	865	1,800	2.08		
Cost of CPO production (USD/t)	80	68	87	181	2.08		

Notes:
*Plasma IV was excluded in 1991 as it was not in full production yet. This plasma however appears to lower the average for 2008 as its average is below total plasma average.
× Family labour input in 1991 is based on average rural wage in 1991 (IDR 2000), in 2008 it is based on the wage a fulltime labourer in Ophir makes.
+ For this correction the Consumer Price Index in Indonesia was applied, which indicated a 6.39 fold price increase between 1991 and 2008.
-2008 was a year with extremely high CPO and PK prices-Exchange rates: 1991, USD 1: IDR 2000; 2008, USD 1: IDR 9970
-Oil extraction rates used: 1991; 22.58; 2008; 20.78 (source: PTPN VI)
-Nucleus has 118 palms/ha whilst plasma has mostly between 121 to 124 palms/ha, with exceptions in plasma IV with only 115 palms per ha.

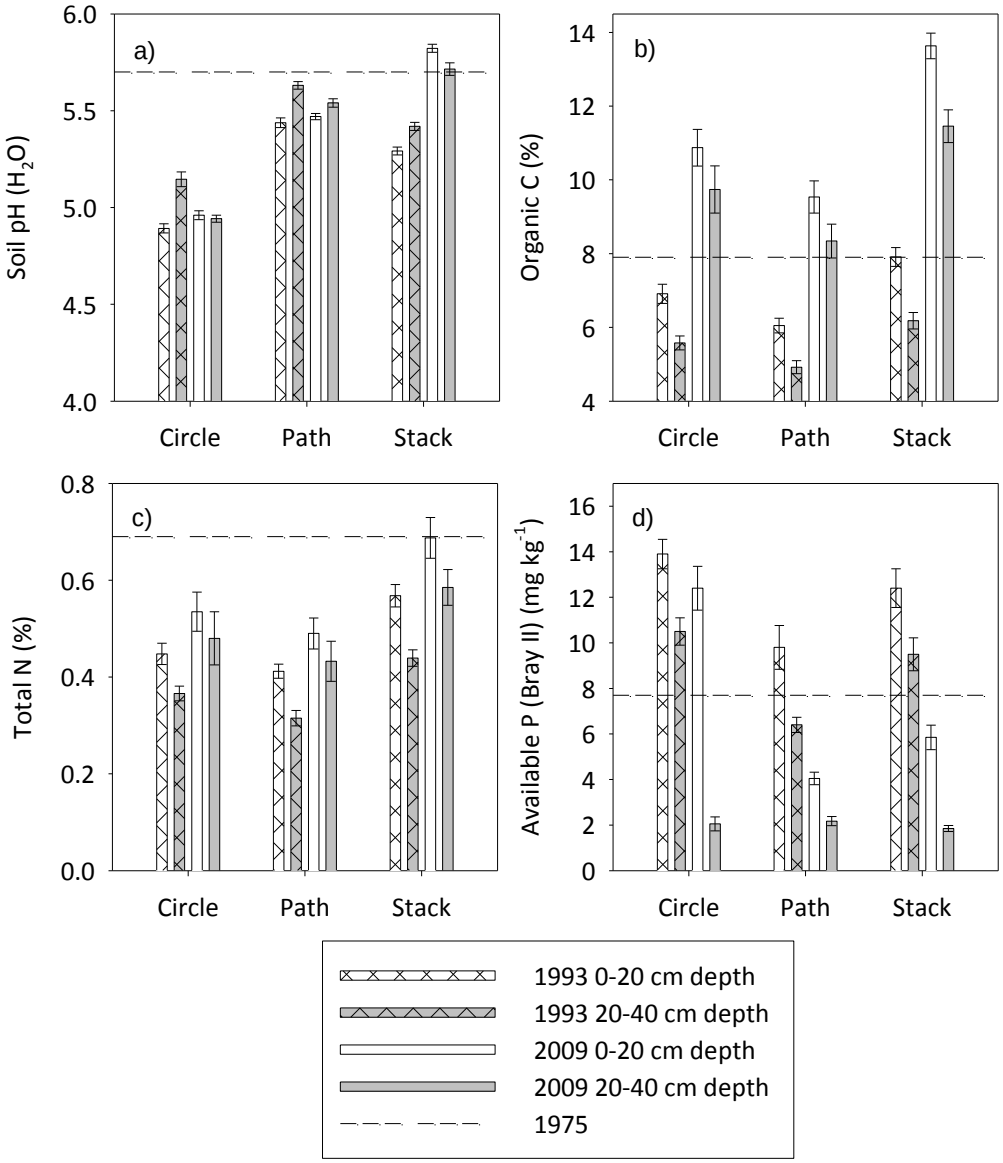
Assumptions:
-The man days required to perform all activities on 1 ha was 100 days (source BMZ 1992), our assumption is this has not changed over time.
-Hired labour accounted for 40% of labour in 1990 (Bergschneider, 1990) and this number was also assumed for 1991.
-The percentage of hired labour increased to 78% in 2009. However this might be underestimated due to the sampling frame which only took place under participants within the project area.
-In 2009 fulltime labourers made around IDR 3.5 M per month, maintaining eight 2ha plots and 78% of labour activities are performed by labourers. Therefore average labour wage per ha is calculated as ((3.5 M/16)*12)*0.78.

Annex V. Project costs till 1992 (millions currency units) (BMZ 1992)

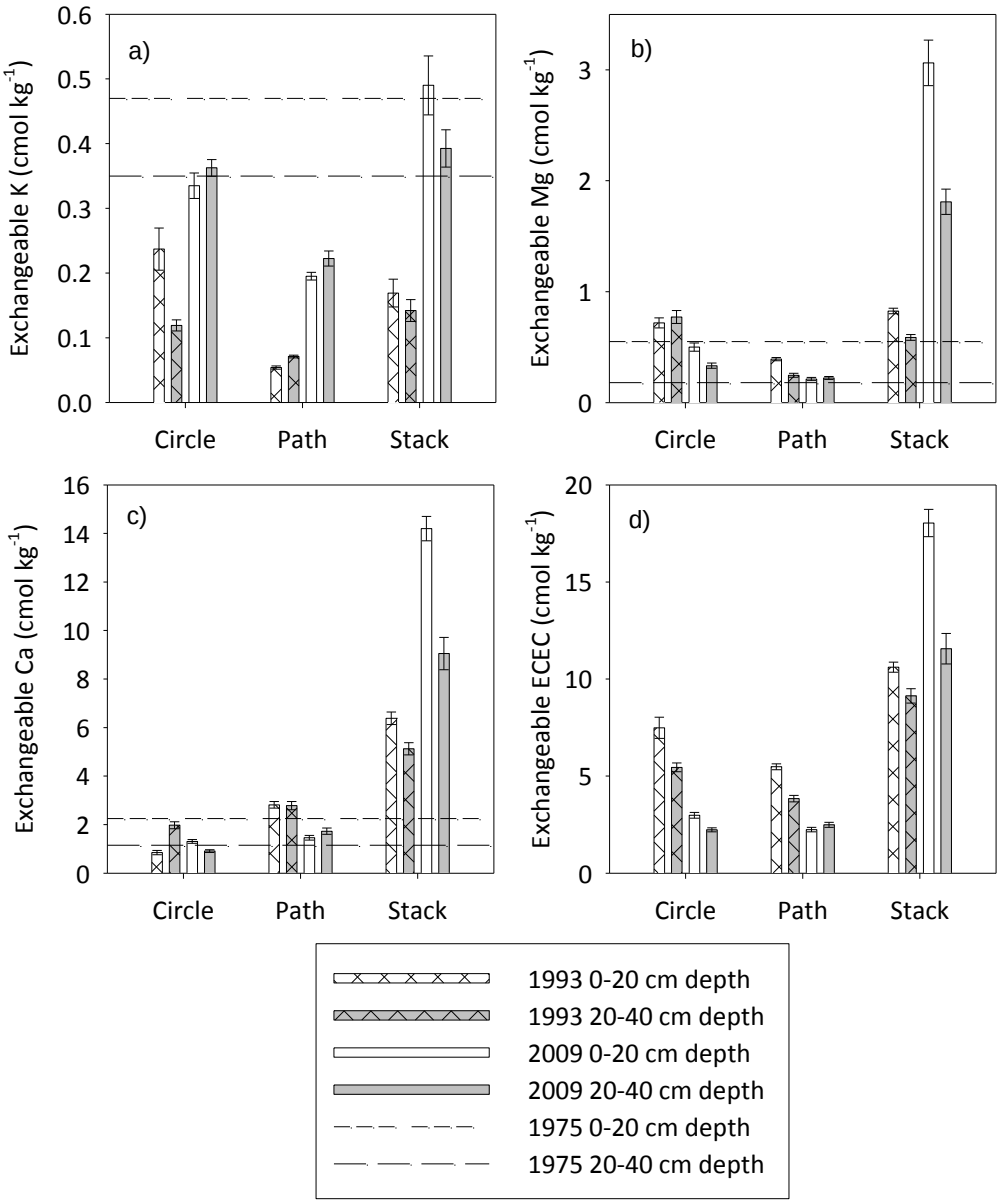
	Indonesia	German cooperation				Total		
		Financial		Technical				
	IDR	IDR	DM	IDR	DM	IDR	%	USD *
Plantation development								
Inti I						3,026	5	2.1
Plasma I-V						8,633	15	6.0
Sub total	**8,434**	**3,225**	**6**			**11,659**	**20**	**8.1**
Roads and houses								
Veteran houses						571	1	0.4
Inti I, mill roads						489	1	0.3
Plasma I-V						6,208	11	4.3
Sub total	**5,451**	**1,817**	**2**			**7,268**	**13**	**5.0**
Infrastructure and services								
Mill	3,221	9,344	12			12,566	22	8.7
Harbour	881	500	1			1,381	2	1.0
Mill housing	2,181					2,181	4	1.5
Mill offices	273					273	1	0.2
Mill machinery	417					417	1	0.3
Mill vehicles	474					474	1	0.3
Equipment	144					144	0	0.1
Consultants		4,160	6			4,160	7	2.9
DIWI consultants (BMB)		2,145	3			2,145	4	1.5
GTZ costs				9,525	13	9,525	17	6.6
Disbun	579					579	1	0.4
Sub total	**8,170**	**16,149**	**23**	**9,525**	**13**	**33,845**	**60**	**23.4**
Total	**22,055**	**21,192**	**31**	**9,525**	**13**	**52,772**	**93**	
Development cost Inti II / III	3,957					3,957	7	2.7
Total cost	**26,012**	**21,192**	**31**	**9,525**	**13**	**56,729**	**100**	**39.2**
Total cost %	46	37		17		100	100	

*Cost estimated in USD using 1 USD =IDR 1,446

Annex VI. Soil pH (a), organic carbon (b), total nitrogen (c), and available phosphorus (d) in soil beneath the weeded circle, access path and frond stack (Fairhurst 1996 and this study).



Annex VII. Soil exchangeable K (a), Mg (b), Ca (c), and effective cation exchange capacity (d) in soil beneath the weeded circle, access path and frond stack (Fairhurst 1996 and this study).



Annex VIII. Content of GTZ Institutional Training Program for NESP Ophir project

From 1982 to 1996 GTZ implemented the following five subsequent phases, through their consultants for the planned structure and the entire training to realize self management by farmers in Ophir. The project development objectives of the five stages are as follows:

Phase I, 1982 - 1984

- The creation of social and economic framework for participation of settlers in the shaping and development of the project approach.
- Analysis of social structures and taking these into account when settling the farmers in the project area.
- Familiarization with the farmers of the project concept NESP-OHIR.
- Training of the target in the plantation-technical field.
- Develop training programs for basic trainings.
- Formation of structures to build a self-organisation and a smallholder plantation management system.
- Strengthening of group consciousness, encouraging initiative and responsibility in taking smallholder plantations management.
- Develop an overall concept for the establishment of a settler community NESP-Ophir.
- Consulting and training for the intensification of the group formation process.
- Training and retraining of program managers involved.
- Setting up a counselling service system in cooperation with the government advisory bodies.

Phase II (1984 – 1986)

- Advice on the summary of individual groups to larger organisational units.
- Preparation of recommendations on the legal protection of the settlers BKAK organisation.
- Assistance in the formation of an institutional organisation of farmers' BKAK "and its formal recognition by the provincial government.
- Training of leading personnel in the administrative management field.
- Technical training of all governing bodies to support the comprehensive management of smallholder organisation.
- Assistance in the preparation of a plantation-clearing system.
- Assistance in the preparation of a credit agreement for the farmers.
- Preparation of a settler contract.

Phase III (1987 - 1990)

- Assistance with the reunification of the section as an organized group structure economically oriented umbrella organisation of all project participants on the basis of a separate legal status as part of project design.
- Assistance in the formation of cooperative structures between BKAK and the Nucleus Estate PTP VI.
- Develop training programs for the promotion of individual groups in regard to partnership behaviour, communication with other groups, led by groups or group partnerships.

- Assistance in conducting the various training programs.
- Preparing a road maintenance and repair program.
- Develop a program to provide financial takeover of input services for the management of the plantation included the production network.
- Assistance in preparing a coordinated settlement system between the various units BKAK concerning the uniform plantations to manage production.

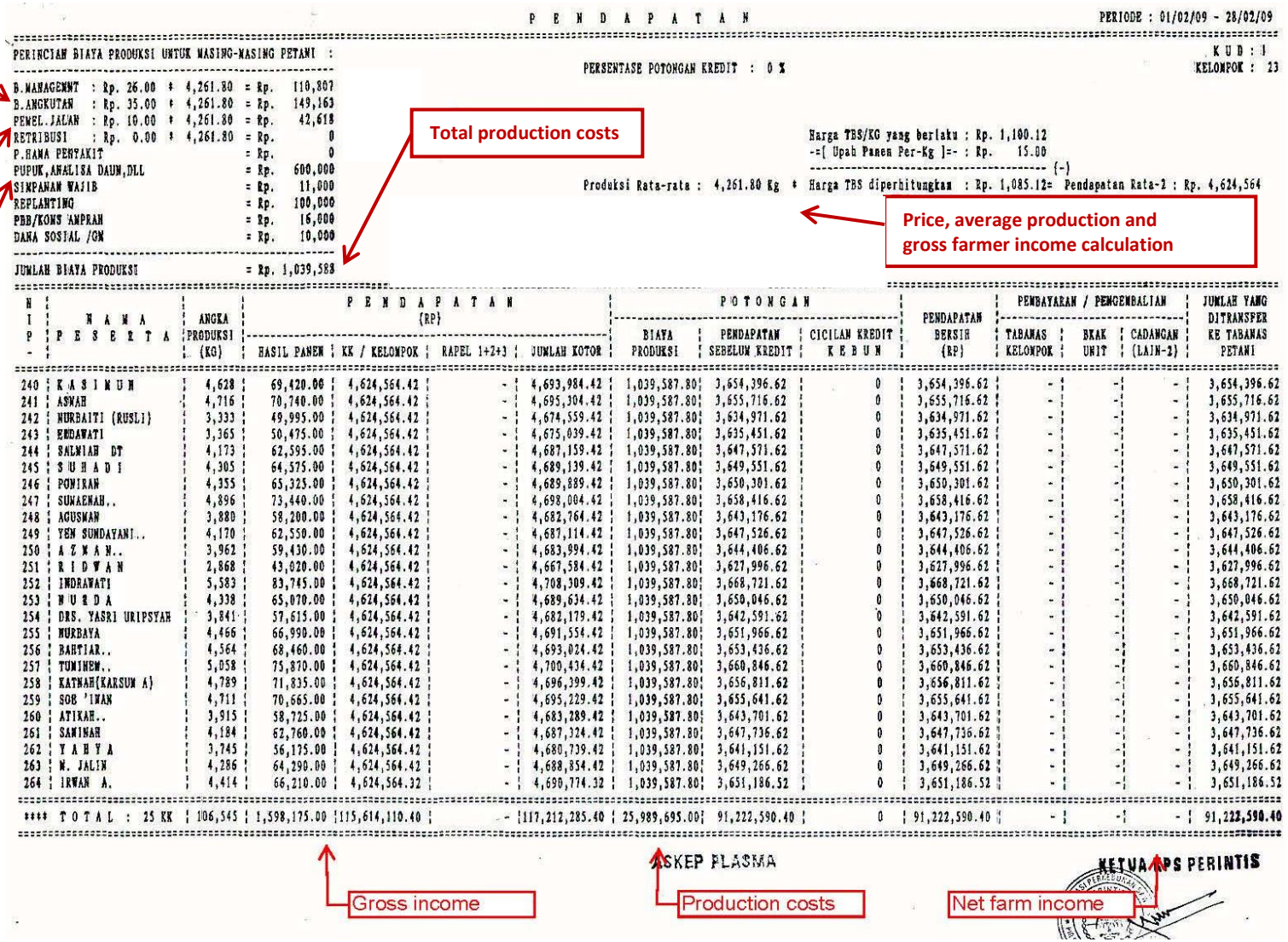
Phase IV (1990 - 1992)

- Preparation of the umbrella organisation BKAK PIR Ophir for conversion into a state-provided form of NESP-organisational system.
- Drafting of statutes, rules of procedure and voting for the governing body or for NESP cooperatives.
- Preparation of a cooperation agreement between the parent organisation NESP-Ophir, the Nucleus estate PTP VI and the bank involved, BPD.
- Assisting with the transformation of NESP cooperative in an integrated system of cooperation between the four co-primary and a secondary Ophir cooperative (KJUB) as an umbrella NESP-Ophir.
- Preparation of a cooperation agreement between the individual cooperatives Ophir and KJUB Ophir.
- Training of qualified executives for the planning and implementation of indoor training measures. Workshops and small seminars.

Phase V (1993-1996)

- Workshops on Ophir experiences.
- Implementation of Ophir knowledge into other PIR-Trans projects in West Sumatra.
- Ministry of Transmigration joined in 1993, as these new projects were PIR-Trans projects.
- GTZ assistance in setting up other PIR-Trans programmes, including conversion of land.

Annex IX. Example of a farmer accounting sheet (Amprah I)



P E N D A P A T A N — PERIODE : 01/02/09 - 28/02/09

K U D : 1
KELOMPOK : 23

PERINCIAN BIAYA PRODUKSI UNTUK MASING-MASING PETANI :

PERSENTASE POTONGAN KREDIT : 0 %

B.MANAGEMNT	: Rp. 26.00	* 4,261.80	= Rp.	110,807
B.ANGKUTAN	: Rp. 35.00	* 4,261.80	= Rp.	149,163
PEMEL.JALAN	: Rp. 10.00	* 4,261.80	= Rp.	42,618
RETRIBUSI	: Rp. 0.00	* 4,261.80	= Rp.	0
P.HAMA PENYAKIT			= Rp.	0
PUPUK,ANALISA DAUN,DLL			= Rp.	600,000
SIMPANAN WAJIB			= Rp.	11,000
REPLANTING			= Rp.	100,000
PBB/KONS AMPRAH			= Rp.	16,000
DANA SOSIAL /GN			= Rp.	10,000
JUMLAH BIAYA PRODUKSI			= Rp.	1,039,588

Harga TBS/KG yang berlaku : Rp. 1,100.12
-=[Upah Panen Per-Kg]=- : Rp. 15.00
(-)
Produksi Rata-rata : 4,261.80 Kg * Harga TBS diperhitungkan : Rp. 1,085.12= Pendapatan Rata-2 : Rp. 4,624,564

NIP -	NAMA PESERTA	ANGKA PRODUKSI (KG)	PENDAPATAN (RP) HASIL PANEN	KK / KELOMPOK	RAPEL 1+2+3	JUMLAH KOTOR	POTONGAN BIAYA PRODUKSI	PENDAPATAN SEBELUM KREDIT	CICILAN KREDIT KEBUN	PENDAPATAN BERSIH (RP)	PEMBAYARAN / PENGEMBALIAN TABUNGAN KELOMPOK	BKAK UNIT	CADANGAN (LAIN-2)	JUMLAH YANG DITRANSFER KE TABUNGAN PETANI
240	KASIMUN	4,628	69,420.00	4,624,564.42	-	4,693,984.42	1,039,587.80	3,654,396.62	0	3,654,396.62	-	-	-	3,654,396.62
241	ASNAH	4,716	70,740.00	4,624,564.42	-	4,695,304.42	1,039,587.80	3,655,716.62	0	3,655,716.62	-	-	-	3,655,716.62
242	NURBAITI (RUSLI)	3,333	49,995.00	4,624,564.42	-	4,674,559.42	1,039,587.80	3,634,971.62	0	3,634,971.62	-	-	-	3,634,971.62
243	ENDAWATI	3,365	50,475.00	4,624,564.42	-	4,675,039.42	1,039,587.80	3,635,451.62	0	3,635,451.62	-	-	-	3,635,451.62
244	SALMIAH DT	4,173	62,595.00	4,624,564.42	-	4,687,159.42	1,039,587.80	3,647,571.62	0	3,647,571.62	-	-	-	3,647,571.62
245	SUHADI	4,305	64,575.00	4,624,564.42	-	4,689,139.42	1,039,587.80	3,649,551.62	0	3,649,551.62	-	-	-	3,649,551.62
246	PONIRAN	4,355	65,325.00	4,624,564.42	-	4,689,889.42	1,039,587.80	3,650,301.62	0	3,650,301.62	-	-	-	3,650,301.62
247	SUNAENAH..	4,896	73,440.00	4,624,564.42	-	4,698,004.42	1,039,587.80	3,658,416.62	0	3,658,416.62	-	-	-	3,658,416.62
248	AGUSWAN	3,880	58,200.00	4,624,564.42	-	4,682,764.42	1,039,587.80	3,643,176.62	0	3,643,176.62	-	-	-	3,643,176.62
249	YEN SUNDAYANI..	4,170	62,550.00	4,624,564.42	-	4,687,114.42	1,039,587.80	3,647,526.62	0	3,647,526.62	-	-	-	3,647,526.62
250	AZWAN..	3,962	59,430.00	4,624,564.42	-	4,683,994.42	1,039,587.80	3,644,406.62	0	3,644,406.62	-	-	-	3,644,406.62
251	RIDWAN	2,868	43,020.00	4,624,564.42	-	4,667,584.42	1,039,587.80	3,627,996.62	0	3,627,996.62	-	-	-	3,627,996.62
252	INDRAWATI	5,583	83,745.00	4,624,564.42	-	4,708,309.42	1,039,587.80	3,668,721.62	0	3,668,721.62	-	-	-	3,668,721.62
253	NURDA	4,338	65,070.00	4,624,564.42	-	4,689,634.42	1,039,587.80	3,650,046.62	0	3,650,046.62	-	-	-	3,650,046.62
254	DRS. YASRI URIPSYAH	3,841	57,615.00	4,624,564.42	-	4,682,179.42	1,039,587.80	3,642,591.62	0	3,642,591.62	-	-	-	3,642,591.62
255	NURDAYA	4,466	66,990.00	4,624,564.42	-	4,691,554.42	1,039,587.80	3,651,966.62	0	3,651,966.62	-	-	-	3,651,966.62
256	BAHTIAR..	4,564	68,460.00	4,624,564.42	-	4,693,024.42	1,039,587.80	3,653,436.62	0	3,653,436.62	-	-	-	3,653,436.62
257	TUMINEM..	5,058	75,870.00	4,624,564.42	-	4,700,434.42	1,039,587.80	3,660,846.62	0	3,660,846.62	-	-	-	3,660,846.62
258	KATNAH(KARSUM A)	4,789	71,835.00	4,624,564.42	-	4,696,399.42	1,039,587.80	3,656,811.62	0	3,656,811.62	-	-	-	3,656,811.62
259	SOB 'IWAN	4,711	70,665.00	4,624,564.42	-	4,695,229.42	1,039,587.80	3,655,641.62	0	3,655,641.62	-	-	-	3,655,641.62
260	ATIKAH..	3,915	58,725.00	4,624,564.42	-	4,683,289.42	1,039,587.80	3,643,701.62	0	3,643,701.62	-	-	-	3,643,701.62
261	SANIMAH	4,184	62,760.00	4,624,564.42	-	4,687,324.42	1,039,587.80	3,647,736.62	0	3,647,736.62	-	-	-	3,647,736.62
262	YAHYA	3,745	56,175.00	4,624,564.42	-	4,680,739.42	1,039,587.80	3,641,151.62	0	3,641,151.62	-	-	-	3,641,151.62
263	M. JALIN	4,286	64,290.00	4,624,564.42	-	4,688,854.42	1,039,587.80	3,649,266.62	0	3,649,266.62	-	-	-	3,649,266.62
264	IRWAN A.	4,414	66,210.00	4,624,564.32	-	4,690,774.32	1,039,587.80	3,651,186.52	0	3,651,186.52	-	-	-	3,651,186.52
****	TOTAL : 25 KK	106,545	1,598,175.00	115,614,110.40	-	117,212,285.40	25,989,695.00	91,222,590.40	0	91,222,590.40	-	-	-	91,222,590.40

ASKEP PLASMA

KETUA APS PERINTIS

Total production costs

Transportation of FFB

Road maintenance

Fertilizer

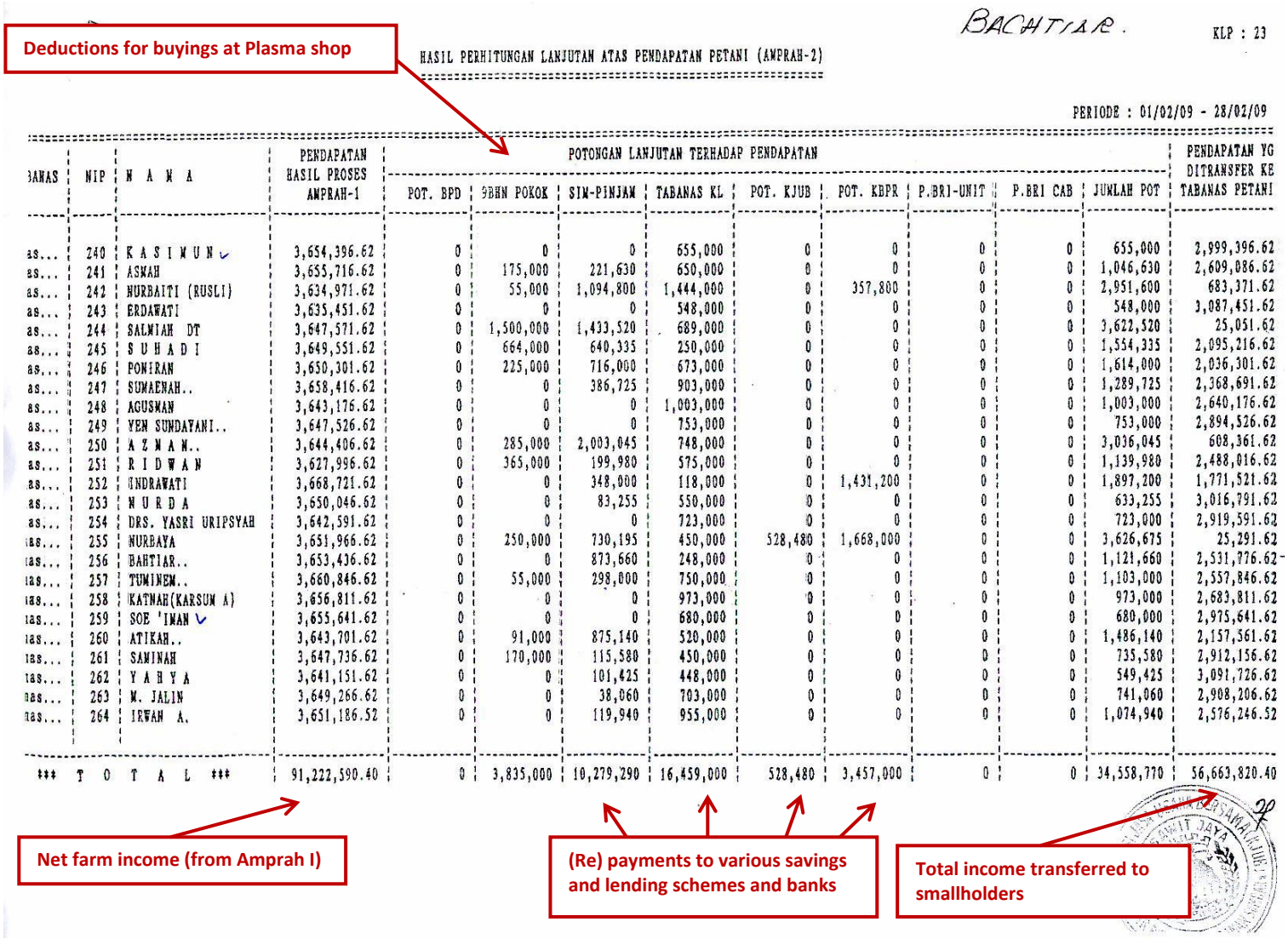
Price, average production and gross farmer income calculation

Gross income

Production costs

Net farm income

Annex X. Example of a farmer accounting sheet (Amprah II)



BACHTIAR.

KLP : 23

HASIL PERHITUNGAN LANJUTAN ATAS PENDAPATAN PETANI (AMPRAH-2)

PERIODE : 01/02/09 - 28/02/09

BANAS	NIP	N A M A	PENDAPATAN HASIL PROSES AMPRAH-1	POTONGAN LANJUTAN TERHADAP PENDAPATAN								PENDAPATAN YG DITRANSFER KE TABANAS PETANI
				POT. BPD	BBHN POKOK	SIM-PINJAM	TABANAS KL	POT. KJUB	POT. KBPR	P.BRI-UNIT	P.BRI CAB	JUMLAH POT	
as...	240	K A S I M U N	3,654,396.62	0	0	0	655,000	0	0	0	0	655,000	2,999,396.62
as...	241	ASWAH	3,655,716.62	0	175,000	221,630	650,000	0	0	0	0	1,046,630	2,609,086.62
as...	242	NURBAITI (RUSLI)	3,634,971.62	0	55,000	1,094,800	1,444,000	0	357,800	0	0	2,951,600	683,371.62
as...	243	ERDAWATI	3,635,451.62	0	0	0	548,000	0	0	0	0	548,000	3,087,451.62
as...	244	SALMIAH DT	3,647,571.62	0	1,500,000	1,433,520	689,000	0	0	0	0	3,622,520	25,051.62
as...	245	S U H A D I	3,649,551.62	0	664,000	640,335	250,000	0	0	0	0	1,554,335	2,095,216.62
as...	246	PONIRAN	3,650,301.62	0	225,000	716,000	673,000	0	0	0	0	1,614,000	2,036,301.62
as...	247	SUMAENAH..	3,658,416.62	0	0	386,725	903,000	0	0	0	0	1,289,725	2,368,691.62
as...	248	AGUSWAN	3,643,176.62	0	0	0	1,003,000	0	0	0	0	1,003,000	2,640,176.62
as...	249	YEN SUNDAYANI..	3,647,526.62	0	0	0	753,000	0	0	0	0	753,000	2,894,526.62
as...	250	A Z M A N..	3,644,406.62	0	285,000	2,003,045	748,000	0	0	0	0	3,036,045	608,361.62
as...	251	R I D W A N	3,627,996.62	0	365,000	199,980	575,000	0	0	0	0	1,139,980	2,488,016.62
as...	252	INDRAWATI	3,668,721.62	0	0	348,000	118,000	0	1,431,200	0	0	1,897,200	1,771,521.62
as...	253	N U R D A	3,650,046.62	0	0	83,255	550,000	0	0	0	0	633,255	3,016,791.62
as...	254	DRS. YASRI URIPSYAH	3,642,591.62	0	0	0	723,000	0	0	0	0	723,000	2,919,591.62
as...	255	NURBAYA	3,651,966.62	0	250,000	730,195	450,000	528,480	1,668,000	0	0	3,626,675	25,291.62
as...	256	BAHTIAR..	3,653,436.62	0	0	873,660	248,000	0	0	0	0	1,121,660	2,531,776.62
as...	257	TUMINEM..	3,660,846.62	0	55,000	298,000	750,000	0	0	0	0	1,103,000	2,557,846.62
as...	258	KATMAH(KARSUM A)	3,656,811.62	0	0	0	973,000	0	0	0	0	973,000	2,683,811.62
as...	259	SOE 'INAN	3,655,641.62	0	0	0	680,000	0	0	0	0	680,000	2,975,641.62
as...	260	ATIKAH..	3,643,701.62	0	91,000	875,140	520,000	0	0	0	0	1,486,140	2,157,561.62
as...	261	SAMINAH	3,647,736.62	0	170,000	115,580	450,000	0	0	0	0	735,580	2,912,156.62
as...	262	Y A H Y A	3,641,151.62	0	0	101,425	448,000	0	0	0	0	549,425	3,091,726.62
as...	263	M. JALIN	3,649,266.62	0	0	38,060	703,000	0	0	0	0	741,060	2,908,206.62
as...	264	IRWAN A.	3,651,186.52	0	0	119,940	955,000	0	0	0	0	1,074,940	2,576,246.52
***	T O T A L	***	91,222,590.40	0	3,835,000	10,279,290	16,459,000	528,480	3,457,000	0	0	34,558,770	56,663,820.40

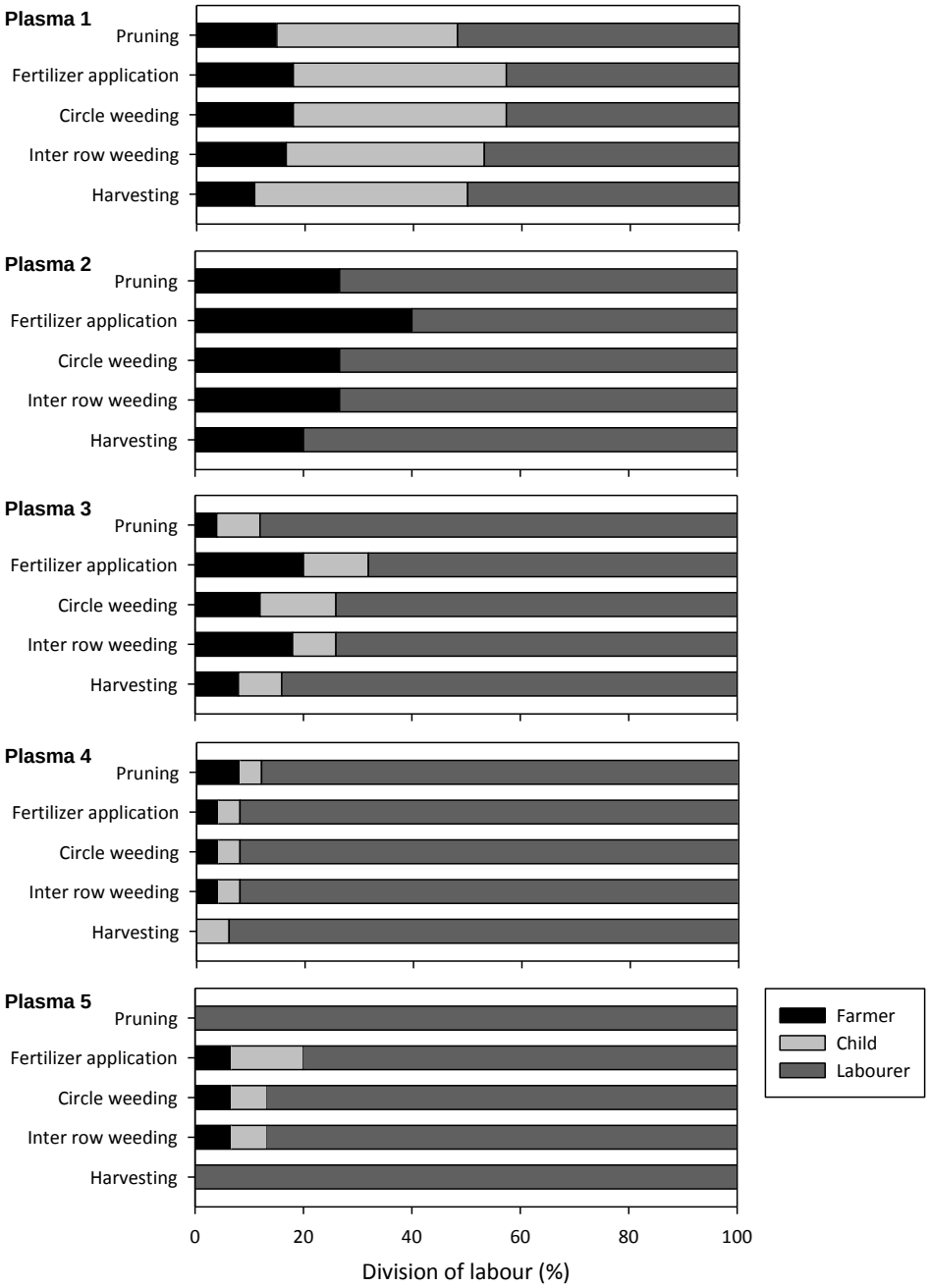
Deductions for buyings at Plasma shop

Net farm income (from Amprah I)

(Re) payments to various savings and lending schemes and banks

Total income transferred to smallholders

Annex XI. Differentiation in plantation labour between plasmas



Annex XII. Setup and content of training programme (Heering 1993)

Trainings:	Objectives and activities	Content of trainings:
Motivation course*	Goals: Participation in NESP-Ophir project Selection and registration of settlers: allocation of house, home plot and oil palm plot; explanation on content of basic trainings in preparation for creation of smallholder organisation.	- (Only introduction)
Basic training I *	Goals: Building a self-reliant organisation Make clear rights and obligations; creation of community spirit; educating about project concepts; structures in self-reliant organisation; Preparations of farmers for the group trainings:	- Goals of project - Tasks of smallholders - Rights of smallholders - Obligations of smallholders - Leadership - Cooperation - Communication
Basic training II * (incl. study trip)	Goals: Creation of technical management at micro scale Make clear how communal management of the plantation functions; increase technical knowhow, smallholder management skills, taking responsibility, cooperation between groups.	- Plantation management - Plantation maintenance - Fertilizers - Planting material - Harvesting - Quality control - Registration - Transport - Delivery - Weighting
Main training (for group members and group leaders)	Goals: Establishment of a jointly founded organisational structure within a legal framework Trainings for overall management of the plantation by plasma-group representatives, creation of joint-management strategy, legal basis, formation of the umbrella organisations for all members.	- Cooperation within groups - Group dynamics - Group management - Organisational structures - Communication - Partnerships - Coordination - Behavior - Social ethical aspects - NESP philosophy

Main training II (for senior leaders in the farmers' organisation (e.g. leader of the Cooperative))	Goals: successful collaboration between organisational structures. The management of the farmers' organisation in all aspects trainings of the senior staff in administrative management.	- Leadership and management in the plantation sector - Leading meetings - Organisation of work processes - Problem Solving - Budget planning - Decision making - Finance - Delegation of tasks	- Setting up of database - Negotiating Technology - Human Resources (Planning) - Presentation techniques - Design of training measures - Control mechanisms (sanctions) - Business Philosophy - Management of staff - Profit versus-benefit thinking
Main training II (for senior leaders in the farmers' organisation)	Goals: successfully functioning Ophir structure, in which the different organisational units cooperate in order to support effective work processes. Technical skills and professionalism of the leading staff of all executive bodies: over the overall responsibility, execution of all tasks in plantation management and technology in cooperation with the Nucleus Estate of PTP VI.	- Plantation management - Tree census - Early warning system - Leaf analysis - Erosion Control - Plant Protection - Soil analysis - Fertilizer management - Plant selection	- Road maintenance - Drainage - Use and maintenance of equipment for street repairs - Use of a stone crushing plant - provide training on use of home plot - Home economics

*= Compulsory for all Ophir participants

Annex XIII. Local Minangkabau land rights, role of the authorities and businesses concerning oil palm development in West Sumatra.

West Sumatra is the homeland of the matrilineal *Minangkabau* people. *Minangkabau* society was made up of three kingdoms: *Luhak Agam* (*Bukittinggi* area), *Lima Puluh Kota* (*Payakumbuh* area) and *Tanah Datar* (*Batusangkar* area). These areas had fairly centralized governance structures, certainly compared with *rantau*, or areas 'outside' the *Minangkabau* kingdom heartland. *Dituaks* safeguarded security in these *rantau* areas where governance structures were fairly independent and based upon matrilineal clan orientation, which is still a pillar of current *nagari* governance structures. Local clan leaders were in charge of *adat* land. West Pasaman, classified as part of *rantau,* was sparsely populated at the turn of the century. The area was first colonized by *Minangkabau* people but there were also influxes of people from *Mandailing* in North Sumatra whilst Javanese workers were brought in to the area as plantation workers soon after the turn of the last Century (interview LBH Padang, 15-04-2009) (BMZ 2004; von Benda-Beckmann and von Benda-Beckmann 2004).

The *Minangkabau* were regarded as a highly civilized society by the Dutch colonizers who incorporated *Minagkabau adat* or traditional property rights in their indirect rule system. In this complex property system *pusako* land was used by clan members for agriculture, and *ulayat* land was reserved for future generations. Both *pusako* and *ulayat* land are considered communally owned but they do have different rights and constraints attached to them. In principle all lands in West Sumatra have communal right claims and are divided between the matrilineal clans. Although the *pusako* system was acknowledged by the Dutch, the *ulayat* system proved more problematic. There was much misunderstanding between the Dutch and Minangkabau because the Dutch interpreted *ulaya*t lands as 'unused', and without ownership. Since the *ulayat* land was not 'owned' it was deemed to belong to the State (von Benda-Beckmann and von Benda-Beckmann 2004).

According to the traditional *Minangkabau* system, land cannot be bought or sold and land which belongs to a clan, may be pawned or rented out, but belongs to the clan in perpetuity. Land that has been rented out or pawned may be redistributed to other clan members when the 'tenancy' expires. The organisation responsible for *pusako* and *ulayat* land is the *Kerapatan Adat Nagari* (KAN). Although inheritance goes through the matrilineal line, each clan is led by male elders called *Ninik Mamak*.

During the Suharto era there was little respect given to regional cultural and governance structures and instead the focus was on implementing standard national structures across all regions and to develop the country based on capitalism where military and government interests were strongly interwoven. Local government structures that had been respected by the Dutch were suppressed by the Suharto régime and local people were often intimidated by the military, who supported projects executed by the strongly centralized government in Jakarta.

In 1997 with the downfall of the Suharto government, Indonesia embarked on *reformasi*, a period with more open political and social debate that led to the process of decentralization and greater regional autonomy. This also had a strong impact in West Sumatra, where the *Minangkabau* people reasserted their distinctive culture and reverted to the *nagari* local government unit, which had been replaced by the Indonesian *desa* structure during the Suharto régime. National legislation, based on laws from 1945, the 1960s and 70s was challenged by the provincial and district authorities. Under this system of *legal pluralism* (von Benda-Beckmann and von Benda-Beckmann 2004) West Sumatra actors 'shop' for legislation that is in their best interest by referring to whichever law (national or provincial) that best served their interests. The provincial government introduced far reaching legislation in 2008 that gave responsibility for land administration to the KAN. Non-government organisations are also lobbying the provincial government to increase the rights of local communities to manage their communal assets and resources. Due to the present struggle between national and provincial legislation there is much uncertainty with regard to land rights and land tenure.

Local leaders were easily manipulated by businessmen and the District administration to agree to provide land for development during the oil palm boom in West Pasaman in the 1990s (Colchester, Jiwan et al. 2007) (Interview Andiko, 24-03-2009). In order to provide companies with secure land

tenure, *ulayat* land must first be converted into State land and a land right certificate (Hak Guna Usaha, HGU) issued to the investor. Thus local leaders agreed to provide land to the State in return for private gain provided by investors, often without the consent or even against the wishes of their constituents (Afrizal 2007). As a result, during a period when *Minangkabau adat* structures were being reasserted and redefined, the authority of clan leaders was undermined because they signed away land assets for oil palm developments.

According to Afrizal (2007) the Ophir project was often used as an example to tempt indigenous people to grant companies access to their communal lands. Afrizal (2007) and Colchester et al. (2007) provide examples of promises and agreements between local communities, governments and businesses that were not kept by plantation companies. The acquisition of land often succeeded but as promises and expectations were frequently not lived up to, tension increased between businesses, the State and indigenous populations. It appears that the RSPO criteria on free, prior and informed consent have often not been implemented in a satisfactory way (Afrizal 2007; Colchester, Jiwan et al. 2007).

In Afrizal's work it appears that the social problems that arise from oil palm developments can be divided in two those resulting from endogenous and exogenous social conflicts. The endogenous problems arise when there is lack of clarity and discontent concerning the distribution of benefits of oil palm developments within the community and the actions of local community leaders are challenged. Although these internal conflicts are not new and already existed long before current palm oil developments (von Benda-Beckmann and von Benda-Beckmann 2006) these problems were fuelled by the search for land for oil palm. Companies, however, may be affected by these internal disputes as the legitimacy of agreements with companies are challenged and may lead to protests. This problem is especially relevant to the those community leaders that prioritized private gain over communal benefit.

Exogenous problems arise when a united local community has a conflict with the State or businesses or both, usually about ill kept promises by companies. Both kinds of conflicts appeared in West Pasaman.

In 2007 the total are of oil palm plantations in West Sumatra was 314,884 ha, of which 140,384 ha was smallholders, 5,897 ha government plantations and 168,603 ha private sector plantations. There are now about 41 large scale oil palm plantation companies in West Sumatra and most of these companies have experienced conflicts with the local population. Local populations have lobbied companies and state officials, blocked roads so that companies could not perform activities, harvested fruits in disputed areas, destroyed company plantations, cultivated disputed land, carried out public demonstrations, asked for help from NGOs and filed court cases (Afrizal 2007).

The main objectives of local communities in West Sumatra were:

- Gaining smallholder plantations: smallholders were often promised smallholder plots but did not receive them, or received only small areas or very poor quality plantings.
- Obtaining communal land improvements (*siliah jariah*): Local populations demanded compensation for the improvements that they had made to land acquired for oilpalm palm plantation development. Companies considered the claims for compensation for land improvements were not valid since *adat* payments had already been made.
- Return of land taken by force: In some cases land was just taken from the local community without their consent. After *Reformasi* local people reclaimed these lands.

PTPN VI was one of the companies which got into conflict with the local community over 197 ha of land which had been taken by force from the local community (Afrizal 2007; interview Zulkifli, 08-0-2009). This land is most likely part of the nucleus estate and was an expansion by PTPN VI outside the original plan. PTPN VI resolved this conflict by making a USD 12,000 payment per year to the local community. Von Benda Beckman and von Benda Beckman (interview, 12-04-2009) indicated that conflicts now tend to be solved by payments to local communities by either the local government or businesses. However, Afrizal (2009) notes many conflicts still continue.

Afrizal (2007; 2009) stresses that although the authorities should play a mediating role between companies and local populations, in reality thet play a role as pusher of business interests. During the Suharto era, business interest often went along with the interests of Suharto. In the post Suharto era, however, local governments received less support from central authorities and had to find their own sources of income. In the case of West Pasaman this meant the promotion of palm oil industry as companies can be fairly easily taxed. Afrizal (2007) indicates that the palm oil companies are responsible for the majority of the Regional Own Income of the West Pasaman district.

Annex XIV. Gap analysis for implementation of RSPO for smallholders in the Ophir Project

#	Principle	Compliance	Gaps
1	Commitment to transparency	• Administration at kelompok and higher levels are available to smallholders. Smallholders shared Amprahs and complete kelompok administration with researchers. • Plasma and KJUB maintain clear administration and provided requested information on fertilizer use, finances, etc.. • Ketua kelompoks have contact details of all members, Plasma and KJUB have contact details of all ketua kelompoks (also many informal contacts between members). • Smallholders are all owners of landcertificates as they repaid their original loans and decided themselves how the landcertificates are stored/ used.	
2	Compliance with applicable laws and regulations	• Smallholder structures are officially recognized by government institutes. • Land certificates are issued to all smallholders and there were clear procedures for credit repayments. • Land status is not disputed as it is former military terrain without *adat* claims or apparent conflict with local community.	
3	Commitment to long-term economic and financial viability	• Annual meetings are held in plasmas in which activities for the coming year are agreed upon. • Plans are being developed for replanting • Replanting fund is in place.	• Replanting plan is late and has not been implemented yet, have to wait and see to see whether smallholders independently manage to arrange this. • Unclear whether farmers saved enough for replanting
4	Use of appropriate best practices by growers and millers	• Soil erosion control procedures documented in the Ophir farmers manual and highlighted farmer trainings, and implemented. • Fertilizer programmes designed and implemented each year and records maintained. • Farmers were trained in IPM and pest and disease monitoring and control is on-going. • Documentation on land productivity maintained by plasmas. Some plasmas from the beginning, other from 2002 onwards • Manual with best practices was provided to farmers.	• Farmers need training on agrochemical use and appropriate health and safety techniques. • Unclear to what extend land labourers received official trainings (does not mean that labourers are unskilled, unknowledgeable or incapable!!!). • Plasma needs proper chemical stores. • Plasma needs landfill site for degradable and non-degradable waste. • Only few kelompoks use EFB's as fertilizer,

			therefore not optimal use of EFB as organic fertilizer.
5	Environmental responsibility and conservation of natural resources and biodiversity	• Lower use of pesticides in plantations then private sector estates. • Plantation was not established on High Conservation Values land.	• Palms planted to river and creek edges. This can be corrected at replanting. • Implement zero burn land preparation at replant.
6	Responsible consideration of employees and of individuals and communities affected by growers and mills	• Smallholders are able to voice complaints through their democratic structures. First complaints are dealt with at kelompok level, then, if necessary, to the higher levels of organisation. • At the setup of the project not all local populations wanted to participate and the wishes of these populations were respected. The project therefore became smaller as originally planned and remnants of non participation are still visible as there still are considerable rice paddies and other agricultural practices within the project area (e.g. Desa Sidomulyo surroundings). • No apparent complaints by local community on smallholder activities. There was a complaint by local community on PTPN VI activities; these have been resolved with financial compensation to local community. • Provided considerable income for rural populations, direct and indirect, and contributed to local economic development. • Local populations that did not want to participated did not have to and their land was not used for the project • Payments to labourers seem good and far above average wages earned in private sector estates. • Smallholders form social funds and decide themselves how these are allocated. Group-system takes care of the weaker members. • There are transparent negotiations and documented contracts between plasmas, which represent smallholders, and the nucleus estate. Smallholders are involved in price determination. • Discussion platforms are in place for conflict resolution between smallholders and nucleus. • Abuse of child labour was not encountered during fieldwork and there were no indications to suspect this.	• As the project is set up nearly 30 years ago there might have been some neglect of role of women in project. There were efforts however in the 1990's to strengthen their position. Also it was observed that woman do join meetings, whilst in the past they did not. • No clear organisations which protects rights of labourers (however, relatively much personal contact between smallholders and labourers.) • Unclarity about to what extend position of veterans influenced non-voicing of complaints by local populations. (One NGO and a palm oil activist raised this issue but it was not possible during the research to investigate this further amongst the local community). *To what extend a clear system for complaints from the local community is currently in place, or relevant, is unclear. There appears no need for this but this might be as no thorough interviews with local community members could be conducted during this research.

7	Responsible development of new plantings	• There are plans made by plasmas for expansion, but these have not materialized yet. There were negotiations with local populations, but these plans were cancelled as no agreement could be reached between plasma and local community on land use.	
8	Commitment to continuous improvement in key areas of activity	• There are continues trainings provided by KJUB and plasma.	• Plasma needs to set up a plan for plantation improvements as it appears there is a lack of innovation. • It is unclear to what extend trainings are effective for maintaining up to date, efficient plantation.

Annex XV. English version of questionnaire used in Ophir

Date survey:
Name Surveyor:

1. Background of the research

The surveyor will explain:

- Objectives of the research
- How and why the respondent is chosen
- How the information will be used
- That the information will be analyzed without the name of the respondent and will not be used outside the survey
- The survey will take one hour

2. Background of the Farmer

2.1 Of which KPS you are a member (please choose one)

Sejahtera	Perintis	Indah	Maju	Makmur

2.2 Kelompok (Group)

Number

2.3 Sex

Male	Female

2.4 Year of birth

year

3. History of the Farmer

3.1 What is your ethnicity? (Please choose one)

Husband	Minang	Batak/Mandailing	Jawa	Other
Wife	Minang	Batak/Mandailing	Jawa	Other

3.2 Are you first, second or third generation Ophir kapling holder?

First	Second	Third

3.3 When did you arrive in Ophir?

year

3.4 What was your employment before you join in Ophir project? (Please choose one of the institutions below and mention your position)

Institution	Position
ABRI (former military)	
PTPN VI Employee	
Civil servant	
Farmer	
Trader	
Other_____	

3.5 Do you receive a pension from former employment?

Yes	No

3.6 If farmer, what kind of farmer were you before join in Ophir? (choose one)

Farmer without land ownership	Farmer with land ownership

3.7 If farmer, what kind of plantation was it? (You can choose more than one)

Shifting land	Rice field farming	Dry land farming	Plantation farming

3.8 Where are you originally from? (please choose one)

West Pasaman	West Sumatera	Sumatera	Other island

3.9 If from other island, what island?

Name of island

3.10 If from West Pasaman, which Nagari?

Kinali	Kapar	other

3.11 Did you grow up in the country side area or in the city? (choose one)

Country side	City

4. The current condition of the farmer family

4.1 Do you permanently reside in the Ophir estate?

Yes	No, if not continue with 4.2 dan 4.3

4.2 How many months you live in Ophir?

month

4.3 How many times you visit Ophir in one year?

times

4.4 Do you have another land beside kebun and home plot in Ophir?

Yes, please continue with question 3.5	No, please continue with question 3.6

4.5 Please mention the location, size of the plot and the crop

Province	Nagari (if SumBar)	size *(ha)*	crop	since

4.6 Information about the farmer's children (if not enough space continue on back of paper)

No.	Year of birth	sex (m/f)	Latest education (SD, SLTP, SLTA, PT)	Employment (if available)	The employment you expect towards the children	Are they still dependent to family? (Yes/No)
1						
2						
3						

4.7 When did you repay the credit for your *kapling*?

Year……	Don't rememeber

4.8 Where is the land certificate held at this moment?

In the landowners house	At the bank	At the KUD	Other …….

5. Current labour management

5.1 How many days are required for the following activities and who is responsible for those activities?

activity	Units	Total	husband	wife	children	laborer	If you hire laborer(s), since when?
Harvesting	days/…….						
Inter Row Weeding	days/……..						
Weeding							
Fertilizer application							
Pest and desease control							
Pruning							
Other							

5.2 What is your reason to hire labour? (Please choose one)

Too old	Have another activity	Far from kebun	Other…….

5.3 Is the productivity of a *kebun* managed by labourer less efficient than a *kebun* is managed by its owner?

Yes	No

5.4 If yes, do you know why? (you can choose more than one from the following options)

The laborer is not disciplined	Work is not done in line with the standard guideline	Doesn't follow the rules/regulations	Other……

5.5 From whom do the labourers acquire their training?

By KUD	By *ketua kelompok*	By landowner	Already trained somewhere else	No training needed for activities

5.6 Do you consider the home plot to be important?

Yes, from my commercial farming I earn about (indicate ……IDR/ ……	Yes, I grow a considerable amount of food for home consumption.	No, I don't use the home plot	No, only small scale hobby farming

6. The services provided by institutions

6.1 What are the roles and responsibilities of actors concerning the following activities: Please indicate if you think these are done in a good manner (+), or whether it needs improvement (-).

	farmer	Kelompok	KUD	KJUB	PTPN VI	Other ……
Replanting						
Fertilizer application						
Kebun maintenance						
Harvesting standard						
Financial issues						
Road maintenance						
Pest and desease control						
Training						
K = policy, B = supervision, M = control/monitoring, +/-						

6.2 Did you receive any training(s) concerning plantation activities (including administration etc.) in the last year?

Yes	No (continue with question 6.4)

6.3 If yes, could you mention what training you received in the last one year?

Subject Training	Duration training (hours or days)	Who provided the training

6.4 What position have you ever held in kelompok or KJUB/KUD?

Position	Year	Institution

6.5 Are there regular meetings amongst the members of kelompok?

Yes, (indicate timeframe) 1/ ……	Yes, irregular	No

6.6 If yes, how many times in percentage do you attend the meeting?

0	25%	50%	75%	100%

6.7 If no, give your reason (choose one)

Live far from *kebun*	Have no time	Not important	No important decisions taken in the meetings

6.8 In your opinion, what services should KUD provide in the future?

6.9 In your opinion, which KUD provides the best service in Ophir?

Perintis	Sejahtera	Indah	Maju	Makmur

6.10 Could you explain briefly the reason why this KUD is the best one? If too little space, write on back of paper.

6.11 Do you use herbicide for weeding?

Yes	No

6.12 If yes, what kind of herbicide do you use? (Mention)

1	2	3	4

6.13 Do you use pesticide for pest and disease control?

Yes	No

6.14 If yes, what kind of pesticide do you use? (Mention)

1	2	3	4

6.15 Do you use any fertilizer?

Yes	No

6.16 If yes, what kind of fertilizer and how much is the concentrate?

	Urea	RP	SP36	Kcl	Kieserite	Dolomite	Borate
Quantity (sacks/year)							

6.17 Do you get any training about how to apply herbicide, pesticide and fertilizer?

Yes	No

6.18 Do you know the current price of Fresh Fruit Bunches?

Yes, IDR_____/kg	No

6.19 Do you still remember how many kilos of Fresh Fruit Bunches can you get from the last month harvesting in Ophir?

Yes _____/kg	No

6.20 If no, do you know where to get the information about it?

6.21 Do you get any technical guideline about *kebun* maintenance?

Yes	No

6.22 If yes, which institution provides the information? (you can choose more than one)

Kelompok	KUD	KJUB	Disbun	PTPN VI	Other sources_____

7. Inheritance and replanting

7.1 When you decide to hand over your *kebun* in Ophir, who will become the next holder of the land certificate?

wife	children	relatives	other

7.2 Can you explain to me the regulations concerning sale of plot? (Let farmer speak and check in the end if mentioned. Surveyors: DO NOT PROPOSE THESE IDEAS!!!!)

Regulations	Y	N
One farmer can have one *kapling* only		
The first priority of *kapling* selling is given to the members of kelompok.		
If there is any outsider who wants to buy the land, thus he/she must get approval from majority of kelompok member.		
Kebun and home plot can be sold at the same time or separately		

7.3 If the member of kelompok lives outside Ophir, who will be responsible to manage the *kebun*? (let farmer speak and check in the end if mentioned. Surveyors: DO NOT PROPOSE THESE IDEAS!!!!)

Regulations	y	n
Kelompok leader manages harvesting and *kebun* maintenance		
The cost of the above activities is the responsibility of the farmer		
The operational cost is taken from the farmer's profit		

7.4 Do you think it is time to replant your *kapling*? (indicate why)

Yes, since…….	No, since……

7.5 If so have you been given any clear idea of options to carry out replanting?

Yes, by (list answers by farmers) ……..	No

8. Income

8.1 How many members of your kelompok reside outside Ophir and their lands are managed by the leader of kelompok?

……members

8.2 What are your family's four major sources of income?

Sources	Ophir oil plantation	Ophir home plot	Other farm	Non-farm
percentage				
IDR/ month				

8.3 What are your family's main sources of non farm income? Include remittances from family members

8.4 Do you have multiple plots of oil palm plantation within Ophir or at another location?

No	Yes, multiple plots in Ophir	Yes, plots outside Ophir

9. Strengths, Weaknesses, Opportunities and Threats

9.1 In your opinion, what are the strengths of the Ophir project?

Strengths

9.2 In your opinion, what are the weaknesses of the Ophir project??

Weaknesses

9.3 In your opinion, what are the opportunities of the Ophir project?

Opportunities

9.4 In your opinion, what are the threats to the Ophir project?

Threats

Thank the participants for their time and cooperation.

Indicate that without their support this study would not be possible.

Annex XVI. Photo report and interviews illustrating NESP-Ophir activities.

This annex provides illustrative material to support and complement the main report and provide impression of the activities in the Ophir project. The main document contains references to boxes and photos, but this document can also be read separately and provides an illustrative overview of the project.

Photo 1. Palm trees are very well managed in Plasma 1 where yields are > 27 t ha^{-1} 27 years after planting. Many smallholders now use herbicides to control weeds in the palm circle. According to the leader of Plasma 1 there are multiple reasons for higher production in Plasma 1 compared to other plasmas, including leadership and attitudes of settlers (Box 7 and 8 in this annex)

Photo 2. Natural conditions are not as good in Plasma 3. The topography is more hilly the soil is more susceptible to erosion. Although the maintenance of palms is good but inferior to the standards in Plasma 1. There are multiple reasons for this (Box 1, this annex). The yields in Plasma 3 are lower than in Plasma 1 but the average of 24.2 tons ha^{-1} $year^{-1}$ over past 20 years is above the average of many leading private sector estates (Table 12).

Box 1: Reasons for differentiation within the plasmas.

The leaders in Plasma 3 highlighted strong geographical differences between the different plasmas, contributing to variation in yield. *'Harvests in Plasma 1 are higher than in Plasma 3 on average, however the kelompoks in Plasma 3 that are flat and next to Plasma I have yields of 26 tons per ha, nearly equal to yields in Plasma I. It is especially the kelompoks next to the mountain which have the poor yields. Also Plasma 1 and 2 were the pilot projects for which the best planting materials were used. For the later plasmas PTPN VI provided poorer planting material. With the replanting we need to obtain good planting material. Since the yield potential in this plasma is lower people are also less motivated to spend time and effort to increase productivity. Also our fields are more distant from our houses. Therefore it takes more effort to go up there and do work or check what the labourers have done, and people don't always make this effort. There is less control on kebun activities and therefore fields are less well maintained'.* (Leaders of Plasma 3; interview 11-05-2009)

Photo 3. The '*List of shame*' in Plasma 3 explicitly stating rules of behaviour to avoid 'shame'. The participatory Ophir smallholder system is based on a combination of social pressure and a fine system to stimulate smallholders to take good care of their plots. As farmers have group incomes they do not accept individuals to neglect their plot and hence the income of the whole group. These grassroots groups form small communities with intertwined social and work relations. Social pressure and shame culture play a role in stimulating and maintaining optimal production.

Photo 4. The secondary cooperatives provide services to smallholders, such as pest and disease control, that cannot be organised efficiently by the farmer groups. Palms infected by Ganoderma are felled and cut into sections to increase the rate of decomposition and reduce the amount of disease inoculum. The procedure could be further improved by digging out the palm bole and cutting the infected material into small pieces <15 cm.

Photo 5. All roads are maintained by the farmers' organisations. Most roads were in reasonable condition but some of the roads in Plasma 3 and the east-west road connecting Plasma 3 and 4 and the mill require attention. During the setup of the project the KJUB was supplied with a stone crusher by GTZ to maintain the roads. This stone crusher is still in operation and also used for commercial side activities.

Box 2: PTPN VI's perception on Ophir organisational structures

'The strength of the Ophir farmers is their highly disciplined organisational structures. It is not the individual farmers that arrange production but the kelompoks and plasma. The plasma is very efficient in distributing fertilizers and road maintenance whilst kelompok management arranges the work that needs to be done collectively in order to maintain effective production. Core of the system is the shared profits. This stimulates farmers to apply strict controls and fine each other when activities are not up to standard. For PTPN VI the role of the KJUB is also important, as this is the organisation we make agreements with and saves us the bureaucratic procedures of making agreements with all plasma's individually. It is good to have one central point to communicate with'.

'Although the system is successful in Ophir it has not been implemented as successfully in other PTPN VI plantations. An important aspect of the successful farmer organisations is that from the beginning the rights and obligations of farmers have to be very clear. The PTPN VI plantations however were already established and it is difficult to implement these rights and obligations. Also we did not have the technical and financial support provided by GTZ in setting up these organisational structures'.

(Technical Manager PTPN VI; interview 12-05-2009)

Photo 6. Plots are harvested once per week and each plasma organises crop collection and transport to the mill using their own trucks and trucks hired from local entrepreneurs. The man on the left scrapes the loose fruits onto a used fertilizer bag which the other two subsequently throw onto the truck. Fines are used to reinforce proper standards and minimized crop loss. Payment of fines is often shared between the smallholder and his workers. The collection of high oil content loose fruits can make a difference of more than 5% in yield.

Photo 7. As none of the smallholders had any experience in palm oil farming proper training was very important. Training aimed at enhancing group dynamjics, general and technical management. A huge step in technical information provision to farmers was a guidebook in which information on best practices was provided in clear and understandable language and with much photos to illustrate correct and incorrect practices. The training programs proved efficient as 27 years after the set up of the project and 13 years after the development organisation left, the system still functions well.

Photo 8. Most plasmas have shops where all kinds of consumer goods and production materials are available for smallholders. The production materials for sale include high quality sickles and aluminum poles imported from Malaysia and used for harvesting.

Photo 9. In some cases the smallholder himself still does the labour himself but in most cases work is carried out by labourers or the children of smallholders. Reasons for this are further described in the main report and Box 5 and include the increasing age of the smallholders. Palms in Plasma 1 are 27 years old and up to 17 m high and require considerable skills to harvest. Labourers are highly skilled in harvesting even these very tall palms and have often have worked for many years in the plantation (see Box 3, this annex).

Box 3: Working conditions for land labourers

'I work fulltime in the Ophir plantation and manage eight 'kaplings' (plots) in four different kelompoks, in Plasma 1 and 2. I visit each kapling once per week and for two days each week I don't work. Per month I cut about 28 tons of FFB, or 3.5 tonnes per plot, and make about IDR 3,000,000 rupiah per month (normal wages for plantation workers in a company estate is around IDR 35,000 per day*). The standard work is harvesting but activities vary and sometimes my bosses want me to do pruning, fertilizer application or other activities. I have worked in Ophir now for 15 years and just approached smallholders to ask whether I could work for them. I learned how to do the work the hard way and I did not get any training from the plasma or kelompok. When the work is not done according to standards there are fines. For not harvesting ripe fruit bunches the fine is IDR 5,000 and for not picking up loose fruits it is IDR 2,500* (this means half for the owner and half for the labourer). *The ketua kelompok can forbid a worker to come to the kelompok. This will only happen when the farmer is warned several times by the ketua kelompok. The harvesting pole is mine, it is imported from Malaysia and rather expensive but good quality, therefore I asked the smallholders for a contribution. In the morning I bring my children to school and then go to the kebun. When school is over my children come to the kebun as well and help me. There was a functioning labour union for the land labourers in 2005, but it does not function properly anymore. The purpose of this union was to provide social services to each other and not to contest the kapling holders'.*

(Land labourer in plasma I; interview 10-05-2009)

Photo 10. The original settler house (30 m^2) was constructed of wood with a concrete floor, WC and well. Most farmers invested in house improvements soon after occupying their plots. Only a few of the original houses remain but there are still a considerable number of original settlers houses in Plasma 3 and 4. Smallholders moved to locations closer to centers of activity and many original houses are occupied by smallholders children or land labourers.

Photo 11. It is ommon practice to include the original house into new modified houses. The house shown in this picture belongs to the Bustami Hasyim family. Currently this house is occupied by the daughter of the owner, and an overview of this family's Ophir experience is provided in Box 4 (this annex).

Photo 12. This farmer in Plasma 2 is producing seedlings from a small backyard nursery. Seedling quality is poor when farmers use loose fruit instead of certified seed and handwatering instead of irrigation to raise plants. If the Plasma decides to produce seedlings for replanting a proper nursery should be established on a permanent site so that seedlings can be produced continuously until replanting is completed in Ophir.

Box 4: Description of family in Ophir plantation, Plasma 5.

Ibu Nora arrived with her father, mother and five siblings from Simpang Empat in 1989. Her family originally came from Talu where her father, Mr Bustami Hasyim, worked as a civil servant. Ibu Nora describes her father as a good man who might not have had been a rich man as he was not corrupt, but he was able to provide his children with a good education. For his good work the Bupati (governor of regency) invited him to join the project in 1989. As her father was skilled and had experience as a civil servant he was elected leader of Plasma 5. Ibu Nora was 17 when they moved to Ophir. When she finished high school she went to Padang to study English and therefore did not reside all her life in Ophir.

When her father died in 1997 her mother inherited the plot. Mrs Hasyim does not reside fulltime in Ophir and went back to her home town after her husband died, and regularly stays with her children who live scattered across West Sumatra. She does not work herself anymore and the work in her plot is done by labourers. These labourers have worked in the plantation for up to 20 years and are very skilful. People in the plantation therefore don't like to see new labourers coming in. Although Mrs Hasyim does not reside fulltime in the project area, she still attends the monthly kelompok meetings.

Ibu Nora, her husband and their three year old son reside permanently in the house of Mrs Hasyim and check whether activities within the plantation are done according to standard. Besides checking the plantation, Ibu Nora is the *bendahara* (treasurer) of the kelompok. For her, as an educated woman, it is not a difficult task and it provides some extra income. Beside the position of *bendahara* she is an English teacher at the high school in Plasma 3 whilst her husband is responsible for their home garden and fishponds. They also collect old paper, keep 15 layers and sell eggs in the village. They are planning to buy more land east of the plantation to grow cocoa.

Ibu Nora is uncertain about the inheritance of the plot, as the family members don't speak about it. Maybe all children will inherit it and receive part of the income or maybe it will go to the one that needs it most. It is unlikely, however, that all the children will go back to Ophir and share the work there. Ibu Nora believes that the project has been a blessing for nearly all smallholders. She recalls an uncle of hers who joined the project. His wife is from Bogor and they lived there, working as noodle sellers. However, he could never make enough money to support his whole family. He got into the project on the recommendation of the bupati and Mr Hasyim. Thanks to this project he was able to feed his family and give them a future perspective. She doesn't want to imagine what would have happened to them if they hadn't joined the project. Although she enjoys the simple life in Ophir compared to big city life, she does not want to stay in Ophir permanently.

Box 5: Mr Kadiran; successful smallholder in Ophir

Originally I am from Bukitingi in Pasaman District and went to technical school where I learned a trade. After I finished my education I got a job at PTPN VI and in 1989 my boss gave me the opportunity to retire and join the Ophir project. As I heard and saw how well the Ophir farmers performed I retired and got a plot. However, my future was not in farming and I hired labourers to do the farming and continue myself with other activities. With the plot as collateral and a loan at the bank and kelompok I bought my first bus and started a bus company and now own two buses. The buses are next to my house which I have been able to expand several times already. I am able to provide my children with good education and next year my daughter will study abroad'

(Smallholder in kelompok 9; interview 13-05-2009)

Photo 13. Many villagers in Desa Sidomulyo (see map in Annex I) decided not to participate in the NESP-Ophir project and their choices were respected, indicating respect for wishes of local populations. As they did not participate and kept on growing other crops there are considerable hybrid maize and rice fields within the plantation area. In the far distance the slopes of Mount Talamau, which used to be forested is now more and more converted into (illegal) farms.

Photo 14. Local traders pick oil palm fruit in Desa Sidomulyo (Photo 16). Many locals choose to grow oil palms as a side activity. These farmers indicated that their yields are small compared to Ophir farmers as they are not well organized and do not enjoy the benefits of the Ophir smallholder structures. Also individual farmers do not feel the pressure of others to obtain optimal yields as Ophir farmers do.

Box 6: Dr. Afrizal on effects of Ophir on local populations

'In the beginning of the project, when the local populations could not see anything, they did not want to join the project. There was plenty of unused land and they preferred to farm instead of becoming labourers. At the start of the project the implementers therefore mainly recruited Javanese transmigrants, who had come to the area in the 1970's. By the project implementer these people were regarded as local populations, but to the local indigenous populations they were clearly not. Later, when they saw that the oil palms were a success, local indigenous populations wanted to join as well but there were no longer opportunities. According to the authorities the land had already been given away to others but they saw that new people were still getting plots, people with connections who did not need these plots anyway as they already were fairly rich. This created a sense of injustice amongst the local population. The local populations did, however, benefit from the project as they could sell their agricultural products to the Ophir farmers. Also they saw how oil palm trees could be grown and that they were quite profitable. This led to many

independent oil palm smallholders, gaining extra income'.

(Dr. Afrizal is a senior sociology lecturer at Andalas University, West Sumatra; interviews 31-03-2009 and 03-04-2009)

Photo 15. Although still highly productive palms in Plasma 1 require replanting. A meeting called during our visit to discuss replanting was well attended. Most farmers favour replanting in a step-wise process where ½ of each farmer group is replanted each year and farmers continue to share proceeds. This would not be possible if each farmer worked individually. For more on monthly kelompok meetings see Box 9.

Photo 16. During the setup of the project palms were planted up to the edge of rivers and creeks. To meet RSPO criteria, a buffer strip should be established along creeks and river banks at replanting to reduce water contamination with agrochemicals.

Photo 17. The machinery at the PTPN VI is old and worn and not up to RSPO standards. Ophir smallholders complain about being cheated on oil content and about frequent breakdowns in the factory halting the intake of crop. The three chimney pipes in the Photo 17 are fitted to incinerators used for burning empty fruit bunches. This highlights a missed opportunity as empty fruit bunches can be used as a substitute for costly mineral fertilizers. Also effluent ponds in produce large quantities of the greenhouse gas CH_4 And it is now feasible and cost effective to capture gas from the ponds and use it to generate electricity for local consumption or for grid supply. In future projects it might be good to include smallholders as shareholders in the mill, thereby binding them to their own mill. Also smallholders can then push improvements in the production process and maintain the high standards, just as in their fields

Box 7: Starting phase of the plantation

'It was a difficult time when we joined the project. Nobody knew exactly what was going to happen and we were told that there would be many difficulties to overcome. In the beginning we only got 13,000 rupiah per month for wages when the palms were not yet producing fruits. But the farmers that choose to participate were tough and had an 'everything is possible' attitude. The difficult period was a lesson for us and we learned that we could achieve a lot if we work together. This working spirit is especially good in our plasma since we were the pioneers. In later plasmas people had different ideas when they joined and saw our success and did not see all the labour we put in. These people bought their way into the project and did not have as much commitment to make it a success'.

(Leader of Plasma 1, interview; 08-05-2009)

Box 8: Need for strong leadership within farmer organisation

The leader of Plasma 1 notes that the management within some plasmas is stronger than in others and the management in Plasma 3, 4 and 5 is not as strong as in Plasma 1. '*Even though the highest authority on decision making is with the farmers, the plasma should also provide supervision and ideas. With the provision of ideas and supervision it is very important to take the farmers step by step and make them realize why certain developments should or should not be done. If there is poor communication and plans are not supported by the farmers they will never work. In some plasmas this does not happen as they have no bravery. The organizers put their emotional feelings in finding the solution for every problem. They find it's a pity if they cannot give something requested by their members. It is frequent that the policy is decided without any deep consideration. An example is credit provision. Farmers in the other plasmas can take loans as much as they want. The plasma should be selective in providing loans to farmers and consider the repayment power of the farmers. If they do not have a promising property as guarantee, the loan shouldn't be given. But, the plasma staff is afraid to reject a farmer's proposal for a loan. Besides, in general, the staffs at the KUD feel that if they refuse a suggestion from the members the members will go ahead without the permission of the plasma. Other plasmas do not do allocate sufficient funds for fertilizer. They might use the funds for other purposes; meanwhile the oil palms need fertilizer. As consequence, the production of oil palm for the next month will be less'.*

(Leader of Plasma 1; interview; 08-05-2009)

Box 9: Description of a kelompok meeting

The *kelompok* meeting is held every second Saturday of the month. Before the meeting starts joint praying takes place in the mosque on the road where most kelompok members live. There were about 24 people present at the meeting and most smallholders sent a representative to the meeting. Although some representatives did not actively participate in the meetings, they did prevent one smallholder from getting a IDR 50,000 rupiah fine. The group consisted of 12 women, mostly >50 years old, and one around 16, and 12 men, mostly >50 years old as well. The only two smallholders not represented were two rich smallholders from outside the area, for whom it is more costly to join the meeting than pay the absentee fine. First there was a discussion about financial aspects of the kelompok, including remarks on debt repayments which did not happen enough. One man indicated that he wanted his land certificate back, although he had a IDR 13,000,000 debt. It was agreed he could get it back and also there was agreement that some

debts would go from one account into another. Measures to curb lending however were not agreed upon and measures were not taken. A comment given by one of the participants was that the kelompok should act like a social unit and not as a bank.

After the financial issues the production technical aspects were dealt with. The *kerani buah* (group's plantation coordinator) presented his report about the amount of FFB harvested, the amounts of unripe fruits and the consequent fines for the smallholders, and when remedial harvesting would take place. This was followed by some discussion on the labourer who performed the activities and whether he needs some extra training by the kelompok or whether the landowner has to instruct the land labourer himself. The *ketua* asked the members whether they had technical problems in the *kebun* and some indicated they had spotted Ganoderma. The technical unit would look into it.

The *ketua* also informed the members about the results of the last plasma meeting and job opportunities at the plasma and KJUB. Volunteers were requested to join the next plasma meeting but there was little interest. After the 3.5 hour meeting, in which there was heated discussion and lots of small talk, the meeting ended with the *arisan* (lottery).

(Observations at Kelompok 93 meeting, 09-05-2009)