

Finding a Balance between Income and Peatswamp Forest Degradation in two Pilot Communities in the vicinity of Berbak National Park

Final report of the social economic research component of the Air Hitam Laut case study project, Sumatra, Indonesia

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Final Report

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Water for Food and Ecosystems Programme

International Agricultural Centre (Wageningen UR)

In cooperation with:

- Alterra
- Arcadis Euroconsult
- Agricultural Economics Research Institute (LEI)
- WL / Delft Hydraulics
- Wetlands International
- University of Jambi
- Pinang Sebatang (PINSE)



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Abstract

The social economic research component of the Air Hitam Laut case study project was formulated and implemented to develop options for enhanced community involvement in the management of Air Hitam Laut river basin and Berbak National Park. A Rapid Rural Appraisal (RRA) and community based planning and action was carried out in two villages in the vicinity of Berbak National Park, Sumatra, Malaysia in 2003 and 2004. The aim of the RRA was to provide information on the socio-economic living conditions in the village communities, to assess their dependency on forest products and on key constraints and opportunities for community development. Community based action and planning aimed to develop alternative non-forest based income generating activities. This report presents an integrated overview of the results of the social economic study.

A consideration of the social economic research within the Air Hitam Laut case study project, the study area and research villages is followed by the methodology used. The socio-economic living conditions and economic activities carried out by the inhabitants of the villages under study are presented, including findings on the value of forests products for supporting their livelihood. A discussion of the settlement history of and land availability in the villages and a presentation of findings on land tenure and land transactions is followed by a discussion on the results of community based planning and action. General conclusions on options for enhanced community involvement in the management of Air Hitam Laut river basin and Berbak National Park are followed by specific conclusions on the local socio-economic living conditions, the socio-economic value of forest products and key constraints and possibilities for community development.

1. Introduction

This report presents an integrated overview of the results of the social economic research done in the context of the project *Promoting the river basin and ecosystem approach for sustainable management of Southeast Asian lowland peat swamp forests* (AHL project). The report comes with conclusions based on these results.

The AHL project focused on the Air Hitam Laut river basin located in Jambi province, Sumatra, Indonesia. A large part of the river bisects the Berbak National Park that was established in 1997 to protect the function of peat swamp forest habitat and its biodiversity.¹ This two years project operated from 2003 until 2004 and aims to analyse the hydrology of the Air Hitam Laut river and the human impacts on the hydrodynamics of the greater Berbak ecosystem, and the dependency of the coastal agriculture on the ecosystem health. The project is coordinated by the International Agricultural Centre (Wageningen UR) and financed by the Netherlands' Programme Water for Ecosystems.

An estimated two third of the total of Berbak National Park area consists of peat swamp (fresh water) forest. This type of forest is essential to the (economic) survival of local populations because they are a source of many forest products and have a function for flood and flow control regulation, prevention of salt water intrusion in coastal agricultural areas and fresh water supply both for domestic use and irrigation. Expansion of agricultural and settlement areas downstream of the Air Hitam Laut river and unsustainable exploitation of both wood and non wood forest resources in Berbak National Park on the other hand are among the existing threats to the remaining peat swamp forest. It needs to be noticed however that the main causes of peat swamp forest degradation are illegal commercial logging activities in Berbak National Park (carried out by people from outside the area) and oil palm development in the upper catchment area of the Air Hitam Laut river.

Past research has shown that there is a pressing need to develop non-forest based sources of income among local communities, especially for the most disadvantaged, to reduce exploitation pressure on forest resources found within the boundaries of Berbak National Park.² This concern focuses attention to use a community-based approach to peat swamp management that combine local development with forest conservation aims.

The social economic research component of the AHL project was formulated and implemented to develop options for enhanced community involvement in the management of Air Hitam Laut river basin and Berbak National Park. The planned activities focus on identification and implementation of alternative income generating activities in close collaboration with local communities and to raise their awareness on the importance of peat swamp forest conservation and to promote sustainable farming practices.

¹ The Berbak area already was designated a Game Reserve in 1935.

² For detailed information see Adisoemarto, S. (2000)

The specific objectives of the social economic study are:

- Analyse the socio-economic living conditions in communities in the coastal area and in the transmigration area in the upper catchment area of the Air Hitam Laut River, and assess their dependency on forest products that are found within the boundaries of Berbak National Park;
- Recommend options for enhanced involvement of local communities in peat swamp forest management and livelihood improvements at the community level.

The approach employed in the study is rooted in a participatory learning and action (PLA) research approach. The approach is built on three cornerstones:

1. Community empowerment through group formation and community based action and planning;
2. Improved livelihoods at the community level through development of alternative income opportunities;
3. Local capacity and awareness building through implementation of participatory appraisals and organization of trainings and study tours.

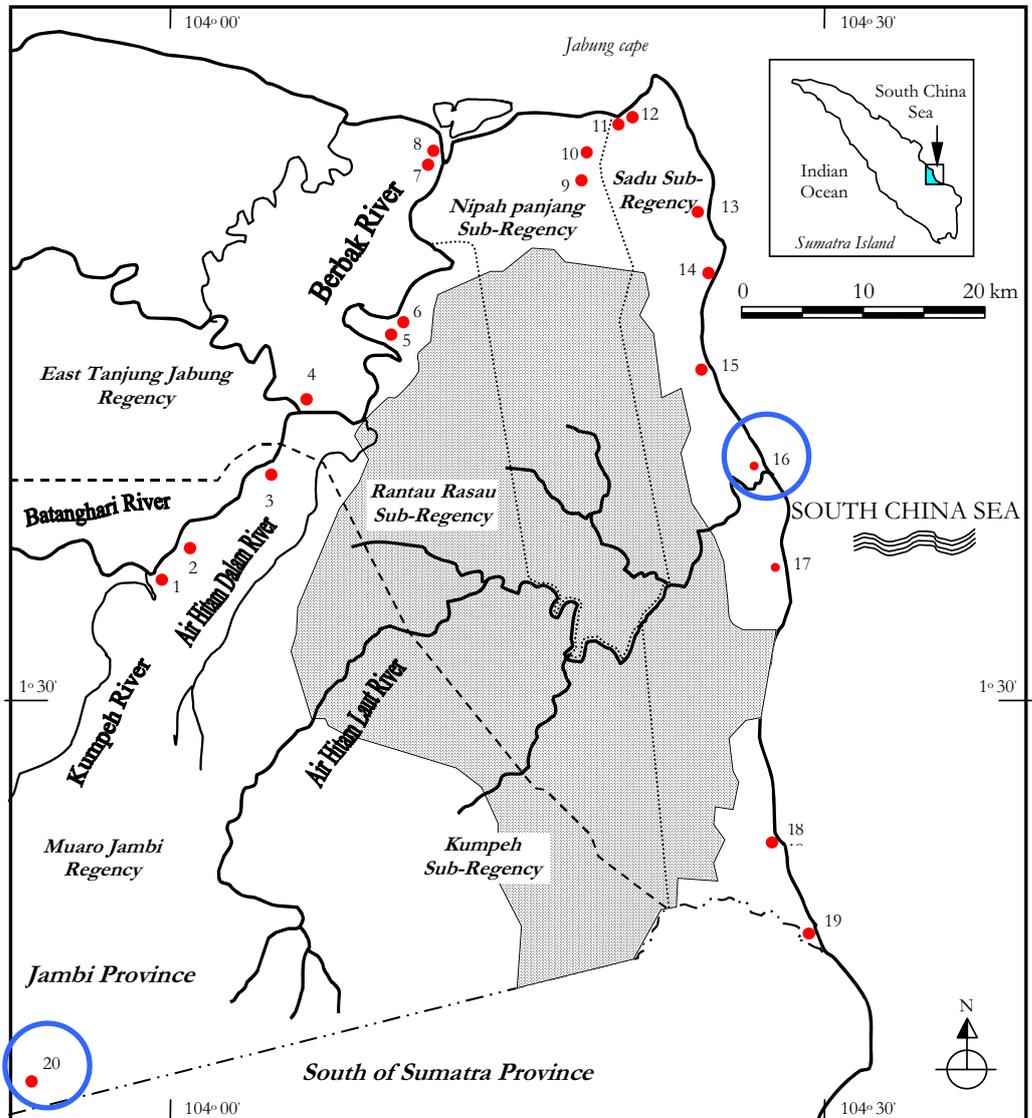
The Agricultural Economics Research Institute (LEI) implemented the study together with the University of Jambi and the local NGO Pinang Sebatang (PINSE), both based in Jambi, Sumatra.

1.1 Site description and selection of research villages

Berbak National Park is located in the coastal zone of Jambi Province (Sumatra) and extends from the coast 45 kilometres inland (see Figure 1). The park covers an area of approximately 185,000 hectares. Administratively, the area comprises parts of East Tanjung Jabung and Muaro Jambi districts and is divided over Sadu, Nipah Panjang, Tantau Rasau and Kumpe Hulu sub-districts. The region is characterised by a tropical rain climate with a dry season ranging from May till October and a rainy season from November till April. Average annual rainfall is 2266 mm. The peat soils that largely underlie the area can be made suitable for agricultural purposes by drainage and irrigation. The original vegetation of the area has been seriously affected by (illegal) logging and land conversion for agriculture. In the coastal area, the total area of agricultural lands has gradually expanded since the 1950s. The upper catchment of the Air Hitam Laut River is recently opened up for oil palm plantations under an official transmigration scheme.

Population figures from 1997 show that the population living in the vicinity of Berbak National Park consists of approximately 35,757 people, largely of Buginese origin (Adisoemarto, 2000). There are twenty-three villages located around the park. Survey results of 1991 indicate that the standard of living of 69% of the total population can be considered low to very low (*ibid.*). The average yearly income is Rp. 3,831,488.00. For an estimated 73.95% and 10.62% of the total population the mean means of subsistence is agriculture and coastal and inland fisheries (*ibid.*). The other people work in various types of occupations like labourer (4.25%), trader (3.25%), public servants (2.62%) and others.

In the area irrigated farming is predominant, which depends on the Air Hitam Laut catchment for fresh water supply. Common foodcrops are rice and a great variety of vegetables. Coconut, banana and coffee are commonly cultivated cash crops. Forest products are a major source of food, construction materials, household utensils, medicines and cash for the local population.



LEGEND

- | | | | |
|---|---------------------|--------------------|----------------------------|
|  Berbak National Park | <i>Villages</i> | | |
|  Boundary of Province | 1. Gedung Karya | 8. Nipah Panjang I | 15. Remau Bakutuo |
|  Boundary of Regency | 2. Jebus | 9. Simpang Datuk | 16. Air Hitam Laut |
|  Boundary of sub-regency | 3. Sungai Aur | 10. Simpang Jelita | 17. Sungai Cemara |
| | 4. Simpang | 11. Sungai Lokan | 18. Labuhan Pering |
| | 5. Sungai Rambut | 12. Sungai Itik | 19. Sungai Benuh |
| | 6. Rantau Rasau | 13. Sungai Jambat | 20. Sungai Gelam II |
| | 7. Nipah Panjang II | 14. Sungai Seyang | |

Figure 1 Research site and villages

Selection of research villages

The study was carried out in two villages that were selected in close cooperation with project partners (see for their location Figure 1). Criteria for selection were: current land use, expected impact of local activities on the status and hydrology of Berbak National Park, accessibility and already on-going community development activities supported by other local development and conservation projects in the area.

Desa Sungai Gelam II located in the upper-catchment of the Air Hitam Laut river (Muaro Jambi district/ Kumpe Hulu sub-district) is created in the year 2000/01 and takes part of the official transmigration scheme in the area. The total number of inhabitants is approximately 1,098 people of which the great majority belongs to the Javanese ethnic group. Their main occupation is oil palm cultivation and plantation labourer. The sale of timber provides for an important part of their income. The village is accessible by (dirt) road but transport is a problem, especially in the rainy season.

Desa Air Hitam Laut is located in Sadu sub-district that administratively belongs the Tanjung Jabung Timur district and is situated downstream Air Hitam Laut River in the coastal area of Berbak region. The village was created in the early 1960s when many Buginese people settled in the area. The village community participates in the Climate Change, Forest and Peatlands in Indonesia (CCFPI) project that runs from August 2001 to March 2005 and supports community based activities related to the protection and rehabilitation of peat swamp forests. The total number of inhabitants is approximately 2,098 people of which 75% belongs to the Buginese ethnic group. The other people belong to the Melayu (10%), Javanese (10%) and other (5%) ethnic groups. Agriculture is by far the most important subsistence and income generating activity in the village. Survey results of 1997 show that 85.6% of the total population is farmer (Adisoemarto, 2000). Coastal fisheries provides for the means of subsistence for 14.4% of the total population (*ibid.*). The village is only accessible over sea (section 3.1.2 gives detailed information on the local infrastructure).

Table 1 Characteristics of the two research villages

| Characteristic | Desa Air Hitam Laut | Desa Sungai Gelam II |
|--------------------------------------|---|--|
| Estimated population size | 2,098 | 1,098 |
| Ethnic composition of the population | Buginese (75%); Melayu (10%); Javanese (10%); others (5%) | Javanese (great majority); Malayu ³ |
| No. of <i>dasun</i> (sub-villages) | 4 | - |
| Number of neighbourhoods | 13 | 12 |
| No. households | 402 | 300 (of which 150 resides in the village) |
| Land use | Agriculture | Oil palm plantations; Timber exploitation |
| Accessibility | Dirt roads (in rainy season hardly drivable) | Over the sea (isolated) |

³ No figures available.

2. Methodology

In the study two major phases are distinguished: (i) diagnosis; and (ii) community based planning and action. The first phase is considered critical for building relationships with community members. The diagnostic phase was conducted in the period September - December 2003 and aimed at analysing the socio-economic conditions at the community level and assessing dependency of local communities on forest products that are found within the boundaries of Berbak National Park. To this end, a rapid rural appraisal (RRA) was implemented in the two research villages by a multidisciplinary team of researchers working for Jambi University, field staff of Berbak National Park office and the local partner NGO (PINSE). The appraisal used a range of RRA/PRA tools (see Table 2), with team members divided into subgroups that worked at the same time on different topics or with a different gender group. These groups were formed according to the interests and expertise of individual team members. To initiate the process of diagnostic research, a planning and training workshop was organized in September 2003 by LEI to train the research team in RRA/PRA tools, to identify data collection needs and problems and to define the work plan for the appraisal. Table 2 gives an overview of the RRA topics and tools.

Table 2 RRA topics and tools

| Topics | Tools |
|-----------------------------------|---|
| Socio-economic conditions | - Semi-structured interviews with small groups and key informants - Venn diagrams |
| Land use and land use changes | - Semi-structured interviews with small groups and key informants - Mapping |
| Economic activities | - Semi-structured interviews with small groups - Matrix ranking |
| Land availability and land tenure | - Semi-structured interviews with key informants - Mapping |
| Agricultural production | - Seasonal calendar - Matrix ranking - Semi-structured interviews with small groups |
| Forest products | - Semi-structured interviews with small groups - Matrix ranking |
| Options for community development | - Focused group discussion |

Community based planning and action was then initiated to address the community members' concerns. This second research phase was implemented in the period January - December 2004 and included the following steps:

1. *Sensitisation of community members and group formation*

Community organizers working for the implementing NGO organized village meetings to explain the aims, activities and process of the social economic research part of the AHL project and to talk about the major local development problems and needs that were identified in the diagnostic phase. Community groups were established bringing together community members who are ready to contribute to planning and implementation of project activities. These groups prepare community development action plans, oversee the implementation of activities and negotiate sharing agreements, including participating members, responsibilities and tasks.

2. *Training of field staff*

Skills of community organizers and staff members of the implementing NGO were developed through an on-the-job training in which classroom sessions were organized to explain the basic concepts of participatory approaches and to explain the projects' method for participatory development planning at the community level. Meetings in the pilot communities to actually practice the projects' method in the pilot communities followed these sessions.

3. *Identification and selection of priority income generating activities*

In village planning workshops, attended by participating community members, community leaders, researchers, community organizers working for the implementing NGO and community workers of other NGOs, priority income generating activities were identified and concrete and realistic plans for their implementation were developed. Priority activities were derived from joint problem analysis that was carried out in separate focus groups according to gender and socio-economic status. In a plenary discussion income generating opportunities that address the major problems were discussed and prioritised through consensus.

4. *Implementation of priority income generating activities*

The project provided upfront technical and financial support (i.e. training, expert advice and working capital) to participating community groups to implement priority income generating activities. In return the community groups need to rehabilitate abandoned agricultural ('sleeping') lands through planting agro forestry tree species that are selected by their members. Written reciprocal agreements were signed between the community groups and the implementing NGO to ensure commitment to implementation of all project activities.

5. *Participatory monitoring*

During implementation of income generating activities, participatory monitoring workshops were organized at the community level, attended by participating community members, community leaders, community organizers, researchers and staff members of the implementing NGO. In sub-groups that were formed according to gender lines, participants discussed the cost and benefits associated with the activities, the problems encountered their causes and opportunities to solve these problems. In a plenary meeting all workshop participants jointly decided upon the concrete lines of action to be taken to address the identified problems.

6. *Awareness building and strengthening the exchange of information and experience*

Study tours were organized for representatives of different community groups to raise their awareness on threats to peat swamp forests and to show good practices of peat land management. Hands-on-trainings at the community level were implemented (e.g. water level management) to promote sustainable farming practices and to enhance information exchange and experience between community members, researchers and community organizers.

3. Result

3.1 Diagnostics

3.1.1 Demographic characteristics

Desa Air Hitam Laut comprises a total of 402 households and 2,098 inhabitants (52% male, 48% female). The total population comprises of approximately 56% of people less than 15 years old. No labour constraints were recorded.

Seasonal migration is common among fishermen that live in the village, and occurs out the fishing season (November-February). In the fishing season, an estimated total number of 200 fishermen from Lampung (e.g. Sungai Burung, Masuji) and South Sumatra (e.g. Sungai Sembilang, Pesujian) arrive in the village to fish.

In Desa Sungai Gelam II, a total of 1,324 people (52% male, 48% female) are officially registered as inhabitants of the village. There are a total number of 300 households. The total population comprises of approximately 82% of people between the age of 15 and 54 years old (considered as the productive working age by the RRA team).

In reality only approximately 50% of the total number of households actually lives in Desa Sungai Gelam II. An estimated total of 40 households have permanently left the village since its creation in 2001 and mainly due to poor economic circumstances, especially the general lack of land suitable for agriculture and employment opportunities. All households that have left the village sold their land to people from outside the village who wanted to install in the village.

3.1.2 Social and economic infrastructure

Local infrastructure and communication

The Desa Air Hitam Laut community is more isolated than that of Desa Sungai Gelam II.

Desa Sungai Gelam II is located in a network of dirt roads connecting the transmigration area to Jambi and other nearby cities. These roads are in poor condition and in the wet season hardly passable for cars. Under good weather conditions, Jambi and other nearby cities can be reached by daily public transportation at Rp. 7,000 - 12,000 one way (price depends on distance). There is no public phone or *wartel* in the village, but residents can pay for the use of private-owned hand phones in cases of necessity.

In contrast, no direct road links Desa Air Hitam Laut to the outside world. This village can only be reached over the sea. Tough people however occasionally cut across the forest by motorcycle to travel to the outside. Nipah Panjang that is located alongside the road to Jambi can be reached by a twice-weekly boat service (*pompong*) at Rp. 15,000 one way. One also can charter a speedboat to travel to Nipah Panjang at Rp. 400,000 - 700,000 (price depends on engine capacity). The trip takes 2-8 hours depending on the means of transport. There are two public phones (satellite hand phones) in the village

where residents can easily communicate with the outside, but in their perspective at very high costs.

Markets

Desa Air Hitam Laut does not have a market, but there are many shops and some stands (*warung*) in the village where people can buy daily necessities. The nearest market is located in Nipah Panjang.

In Desa Sungai Gelam II a weekly market is held and there are a small number of shops and stands in the village. People told that the offer of vegetables and other food crops at the weekly market does not meet their needs. Other markets that are visited are located in Petaling and Jambi. In August 2002 a village cooperative unit (*Kud Mukafat*) was established in the village to facilitate the marketing of community oil palm produce. Many of the village residents do not have access to land for oil palm plantation and therefore the cooperative is not yet operational (section 3.1.4 gives detailed information on land availability).

Educational achievement

The level of educational achievement is low in both research villages.

According to official village statistical data, 21% of the total population of Desa Air Hitam Laut attended primary school, 3% attended junior secondary school and 2% senior secondary school.⁴ Only 0.7% of the total population have a university degree or other type of higher education. The low level of education achieved implies a high illiteracy level. An estimated 26% of the total population cannot read or write.

No official statistical data on educational achievements are available for Desa Sungai Gelam II. The RDA results show however that the majority of the total population has attended several years of primary school and can be considered as literate. None of the inhabitants has entered secondary education.

Religion

The great majority of the residents of Desa Air Hitam Laut and Desa Sungai Gelam II is Moslem. In Air Hitam Laut, 74 persons are Buddhist (mostly Chinese residents). In Sungai Gelam II, 14 persons are Catholic.

Health

In Desa Air Hitam Laut a Public Health Centre (*Puskesmas*) is located and a 'general practitioner', a midwife and two nurses work there. According to village residents the services of the centre meets their needs.

The nearest operational health centre for Sungai Gelam II residents is located in its neighbouring village Sungai Gelam I and one 'paramedic' and one midwife work there. There is a Sub Public Health Centre (*Sub Puskesmas*) in the village but neither supplied or staffed. It is very common for residents to treat themselves with traditional medicines derived from plants that grow in the surroundings of the village.

Water and electricity supply

⁴ Source: Village Head office of Air Hitam Laut, 2003.

For both the residents of Desa Air Hitam Laut and Sungai Gelam II potable water supply is a problem.

Air Hitam Laut residents depend on rainwater harvesting. In the dry season water supplies usually run down and for those people who can afford to do so the option is to buy potable water from the Chinese owner of the only (borehole) well located in the village.

In Desa Sungai Gelam II, the government has developed a well and water tower at considerable walking distance of the village centre. The network of pipes that connect the water tower with individual houses in the village is not operational yet. Village residents therefore depend on rainwater harvesting and small wells for their water supply.

Generators provide electricity in both Desa Air Hitam Laut and Desa Sungai Gelam II. In Desa Air Hitam Laut, there are 30 private-owned generators that operate from 18.00 until 23.00 hour. Electricity tariffs vary between Rp. 20,000 - 30,000 per month, depending on the type of use. In Desa Sungai Gelam II there are 6 private-owned generators of which one belongs to the transmigration *UPT* office. Here, tariffs vary between Rp. 15,000 – 30,000 per month. Most residents though use small oil lamps for lightening their houses.

Schools

Children in Desa Air Hitam Laut attend one of the two state primary schools or the Islamic school (*Pondok Pesantren*) that provides education at the *Tsanawiyah* level (equivalent to junior secondary school) and *Aliyah* level (equivalent to senior secondary school). The state primary schools have a shortage of teachers (teacher-pupil ratio of 1:36).

In Desa Sungai Gelam II, 14 teachers work but there is no school building. In the mornings, education at primary level is given in the village hall and village store room. In the afternoons, education at the junior secondary level is given in the village store room. A school building for junior secondary education is under construction at the community own expense.

Local organisations

In Desa Air Hitam Laut and Desa Sungai Gelam II, the following locally highly valued local groups (in terms of mobilisation of community activities) were observed:

- Family Welfare Group (*PKK*);
- Farmers' Group (*Kelompok Tani*);
- Youth Association (*Karang Taruna*);
- Qoran recital group (*Majelis Ta'lim*).

Next to the above-mentioned groups, in Desa Air Hitam Laut a community empowerment organisation called *Lembaga Pemberdayaan Masyarakat* (*LMP*) is active.

The power to mobilise community activities differs between groups within and between the two research villages (see Zulkifli, 2003 for detailed information).

Government assistance

Governmental assistance in Air Hitam Laut relates to improvement of local infrastructure (year 2000) and support for cattle breeding (year 2003).

Desa Sungai Gelam II as a transmigration settlement has been developed by the government (houses, community buildings, roads, water supply, etc.). In the first year of

their installation, village residents received food subsidies from the government and agricultural tools and inputs such as seeds, fertilizer, dolomite and seedlings of fruit trees. Village residents encounter serious problems with the production of food crops because acid sulphate soils of their gardens. Little or no action has been undertaken by governmental agricultural agencies to address that problem.

3.1.3 Economic activities

Matrix ranking exercises and group interviews were carried out to evaluate the relative importance of the economic activities carried out in the two research villages. These activities are discussed below, with particular attention to their contribution to money income.

Agriculture

Desa Air Hitam Laut residents value agriculture as the most important economic activity. Residents of Desa Air Hitam Laut apply a drainage system for their agricultural activities. Ditches (*parits*) are dug through which acid peat water is drained and removed from the land located alongside the ditches. Crop fields are irrigated by overflows of Air Hitam Laut river.

Rice is the basic food product in Desa Air Hitam Laut and provides monetary income. Other food crops grown in the village are cassava and a great variety of vegetables⁵. Surplus production of food crops is commonly sold at nearby local markets and contributes significantly to household income. An estimated 75% of average daily expenditures per household are provided by selling of food crops.

Desa Air Hitam Laut farmers cultivate coconut, coffee and recently also cacao for the market. The latter two crops are grown as an intercrop on coconut palm plantations. Fresh coconuts are transformed in *copra* by smoking or drying and sold to traders in surrounding villages. The sale of *copra* is valued by village residents to contribute less to household income compared to coffee, mainly because of the current low prices (Rp. 1,350 – 1,400 per kilo).

In Desa Sungai Gelam II, oil palm farming is considered a major income generating activity. Farmers sell their produce to the nearby oil palm company PT. Bahari Gembira Ria. The company pays a standard price of Rp. 665.30 per kilo that is considered satisfactory by farmers. The production of food crops is little developed (and mainly for home consumption) due to the high risks of crop failure caused by acid sulphate soils that are common in the village.

⁵ For detailed information see Zulkifli (2003).

Livestock

Goats and ducks are commonly reared in both research villages ('free range' management). Desa Air Hitam Laut residents also keep cattle and goats. In Desa Sungai Gelam II this is not the case because a general lack of natural fodder due to soil conditions and high water levels.

Livestock is considered in both research villages a minor source of income. Village residents sell their livestock occasionally to other village residents when they have an urgent need of cash. In Desa Air Hitam Laut for instance it is common to sell a cow to finance wedding ceremonies. There is an increased demand for chickens around religious feasts and festivals.

Fishing

Desa Sungai Gelam II residents value fresh water fishing as a minor source of income. Fish and turtles are sold in small quantities at local markets.

In Desa Air Hitam Laut, coastal fisheries are an important income raising activity for residents that belong to the Buginese and Melayu ethnic groups. Since 1979, the year in which new governmental restrictions on land use for agricultural purposes came into force, many residents turned from agriculture to coastal fisheries as their major source of income. Compared to the recent past, coastal fisheries provide low financial returns to diesel fuel. People also told that fish resources (including prawns) are currently threatened from overexploitation. Under these circumstances it is to be expected that fishermen gradually return to agriculture as their main source of income that will affect land availability in the near future.

Hunting

In Desa Sungai Gelam II, trapping of birds is an important income generating activity. The birds are sold as pets to traders at town markets (e.g. Jambi).

Forest products

Residents of both research villages harvest forest products for food and medicines for humans, construction material and household utensils. Non-wood products are primary valued by village residents for subsistence uses and not for commercialisation. Secondary forest areas represent the most important production area for all recorded products, except species that are used for construction material. Appendix 1 gives the results of the preliminary forest product inventory.

Desa Air Hitam Laut residents value wood products derived from Nibung (*Oncosperma tiggilarium*) for its contribution to cash income. The same is true for the sale of products of rattan species and to a lesser extent the leaves of Nipah palm (*Nypa fruticans*). Respondents said that wood for construction is only sold on demand from people living in the village and thus not destined for markets outside the area. The main production area for rattan, Nibung and other species used for construction purposes is peat swamp forest within Berbak National Park. In the direct surroundings of the village no forest is left.

The sale of wood represents a very important income source for residents of Desa Sungai Gelam II. People told that the number of men engaged in timber exploitation for

market purposes is declining because rapid depletion of high-demand species in the direct surroundings of their village (forest that is not yet converted in oil palm plantations). The sale of latex derived from Jelutung (*Difera consulaca*) provides a minor source of income.

Other economic activities

In Desa Sungai Gelam II, processing soybeans for production of *tofu* and *tempe* is an important income generating activity. Soil conditions in the village are a serious constraint for expansion of this type of home industry because they are not suitable for the production of soybeans and hence needed to be bought.

The majority of the employed residents of Sungai Gelam II (both men and women) work as labourers for one of the two nearby plantation companies. Actually an estimated 150 persons, among which 25 women, work for these companies. The standard wage of Rp. 15,000 per person/ day is considered low by village residents and is just enough to fulfil their needs for daily expenditures.

In Desa Hitam Laut, keeping swifts (*Collocalia ficiphagus*) has recently developed as a source of income for residents with the capital needed to construct a swifts' building where they can make their nests (about Rp. 1,000,000). At the time of the survey, 20 of such buildings were observed. People told that birds' nests are easy to market and the average price of Rp. 13,000,000 per kilo is considered very high. The construction of houses and building of boats generates income for those people who have the skills needed.

3.1.4 Land appropriation, land availability and tenure of land

Settlement history

The founders of Desa Air Hitam Laut belong to the Buginese ethnic group and originate from South Sulawesi. People told that in the time of the revolution of Kahar Muzaka in that area many Buginese people have migrated elsewhere. In the early 1960s the first Buginese migrants settled in Berbak coastal area. Before their arrival the area has already been inhabited as respondents told that the first migrants had found abandoned villages and secondary forest areas. A man named Marzuki Luwu was the first to install in the area that is known today as Desa Air Hitam Laut. He became 'river chief' (*kepala sungai*) and in that position the ruler of the area and owner of the land that belong to the village, except land under cultivation. According to Buginese customary law, the person who first developed the land establishes the rights to that land, including the right to allocate land to others. Until the late 1970s other migrants settled in the village belonging to various Buginese clans including Bone, Wajo, Soppeng, and Enrekang. The *kepala sungai* until today holds a strong leadership position at the level of the village as the customary owner of the land that belongs to the village. The village chief (*penghulu*) and leaders of sub-villages (*dusun*) called *kepala dusun* officially rule the village, but in practice their effective authority is rather restricted.

Forest clearance for the governmental transmigration project in the area where Desa Sungai Gelam II has been established started in the year 2000. Before that time (illegal) logging activities were carried out in the area. An oil palm plantation company called PT. Bahari Gembira Ria has developed the land for the creation of a large-scale plantation and

2 hectares so called 'plasma' plantations to be exploited by the transmigrants. The first group of transmigrants arrived in December 2001 and a second group in January 2002. The majority of these people originate from Java but have first lived in transmigration settlements in Atjeh province where they were forced to leave because of unsafe living conditions due to political instability in that area.

Land availability

Residents of Desa Air Hitam Laut have access to more land than they actually cultivate. There are 20 ditches in the village area (10 at each side of the Air Hitam Laut river). Actually only 9 ditches are maintained for agricultural (and housing) purposes.

In the past, the total area of agricultural land that belongs to Desa Air Hitam Laut was much larger than it is today and stretched as far as Simpang Malaka, the area where the Air Hitam Laut river flows into Berbak National Park. In the late 1970s, an administrative decree was issued to protect Berbak National Park for agricultural encroachment by limiting agricultural activities to an area of five kilometres from the coast inland. In the subsequent years, compensation for the loss of agricultural lands located outside the five kilometres area was subject to negotiation between the population of Desa Air Hitam Laut and regional administrative authorities. No agreement however was reached and the concerned landowners were forced to abandon their lands without being paid any compensation.

For Desa Sungai Gelam II residents access to land is a serious problem. The gardens (0.25 hectare/garden) that are located around the houses are unsuitable for the cultivation of common food crops. The land in the vicinity of the village is under control of the companies PT. Bahari Gembira Ria and PT. Gudang Garam for oil palm plantation development. It is officially provided that the first named company allocates two hectares of land (so called plasma plantations) to each of the 300 households that belong to Sungai Gelam II. In 2003, only a total of 304 hectares land was actually granted.

Land tenure

In Desa Air Hitam Laut, the *kepala sungai* or river chief still is considered by village residents as the chief land authority. Together with the chiefs of the ditches (*kepala parit*), the *kepala sungai* administrates all the land that belongs to the village.

According to customary land tenure arrangements the *kepala sungai* holds land rights (including use, management and transmissibility) to the following areas:

- A strip of land (called *tanah buang*) of approximately 1.5 meters (50 *depa*) alongside both banks of Air Hitam laut river.
- Three plots (2 ha. / plot) of land alongside each ditch (including the ditch).

Land transactions

The following types of land transactions were observed in Desa Air Hitam Laut:

- Permanent sale of land: People who sell land need to pay a customary tax (called *uang konsong*) of 10% of the selling price to the village authorities to legalise the transaction.

- Share cropping: a form of contract in which land for wet rice fields, dry fields and cash crop plantations is transferred temporarily, and the recipient is obliged to cultivate it and hand over a previously agreed part of the crop to the owner.
- Borrowing: A common practice within families (for instance between father and son or daughter). The custodian must return land whenever asked by the owner.
- Inheritance: Both men and women are entitled to inheritance. Inheritance partition is decided upon in family meetings. Land is usually equally divided among the heirs.

The residents of Desa Sungai Gelam II are not allowed to sell their plasma plantations, but in practice such land transactions do occur. No other types of land transaction were observed.

3.1.5 Constraints and opportunities for community development

In the two research villages, limited available capital, knowledge, skills and high costs to move products to markets are considered as serious constraints to community development.

Livestock development and development of fruit tree farming are considered in both research villages alternative income opportunities. In Desa Sungai Gelam II, this is also the case for development of pineapple and soybeans production, processing and marketing.

3.2 Community based planning and action

Community based planning and action aimed at the identification, implementation and monitoring of non-forest based alternative income generating activities in the two research village communities. PINSE has facilitated implementation of all community development activities, whilst LEI has provided training in participatory planning and monitoring methods and tools for the field staff. In the process of implementation, technical support was also given by researchers involved in other components of the AHL project, including hands-on-trainings in water level management at the farm level, seedling production and nursery development and management for tree farming activities. The results and lessons learned regarding each of the six steps of the community based planning and action phase (see Chapter 2) are presented below.

1. *Sensitisation of community members and group formation*

In both villages, meetings were organized by PINSE to introduce and explain the projects' aims and activities, to discuss constraints to local development and to sensitize village residents on the status of peat swamp forest in the region. Unfortunately, the results of the activities in the diagnostic phase were not discussed with participants during the meetings.

In Desa Air Hitam Laut, two community groups that were established in 2003 under the CCFPI project (see Chapter 1) participated in the projects' activities. These community groups comprised a total of 38 members in 2004.

In Desa Sungai Gelam, PINSE mobilised the inhabitants to create new groups. Two groups were established that comprised a total of 31 members in 2004.

In both research villages, community group membership in practice is restricted to men, although women sometimes participated in group meetings and also contributed to the implementation of local development activities through labour investments. This situation results from existing gender relations in the participating villages. In participatory planning and monitoring activities (see below), the opinions of women and men participants were sometimes significantly different. This reinforces the importance of involving both men and women in group decision making. Future efforts are thus needed to improve women representation in community groups.

Two community workers were recruited by PINSE (one for each village) to support the community groups in the process of planning and implementation of activities, including facilitation of meetings, information dissemination and trainings in organisation and financial management at the level of the village. In both research villages, community groups appointed (through consensus) a member of the village community to be recruited by PINSE as partner of the community workers.

The presence of community workers in the research villages over a longer time scale served to maintain momentum and provided for a two-way communication channel between the community and the project. The experience and capabilities of the community workers however have a key influence on the direction and outcomes of the community development activities. Careful selection, support and training are thus essential.

2. *Training of field staff*

The participatory planning, monitoring and evaluation approach applied by the project required other skills than were available among PINSE staff. A training was organized to introduce the community workers and other staff members the basic concepts of participatory approaches and different participatory planning stages and to explain and put into practice a range of tools. A total number of 18 persons participated in the training, among which four students of Jambi University and a staff member of another local NGO.

3. *Identification and selection of priority income generating activities.*

In a two days village planning workshop organized in both research villages, participating community groups have identified and prioritized development opportunities to address their priority problems and developed concrete and realistic plans for their implementation (Appendix 2 presents an overview of the results of the village workshops). In following community group meetings, income generating opportunities to be implemented were selected through group consensus and detailed working schedules were developed.

Community groups in both research villages decided to develop joint chicken breeding. In Desa Sungai Gelam II, community groups also planned individual chicken breeding activities to be carried out by their members. In Air Hitam Laut, community groups decided to develop coconut farming for land rehabilitation next to joint chicken breeding.

4. *Implementation of priority income generating and agro forestry activities*

Five years agreements on mutual contributions to implementation of planned community group activities were signed by leaders of the four community groups and PINSE staff. A four days training was organised in Jambi to support the community groups in organizing their groups and to provide for technical information related to the planned development activities. A total number of 36 members (including women) participated in the training. Working capital for purchase of construction materials for poultry houses was allocated to the four groups. For the community groups in Desa Air Hitam Laut budget was made available to buy coconut seedlings, wire for electric fences and a generator.

Four poultry houses were constructed for joint chicken breeding by members of the participating community groups. Chicks were bought in Jambi by community group members together with PINSE staff and transported to the research villages. The community groups were also provided with feed, vaccine and water storage containers. In Desa Air Hitam Laut, a total number of 1,100 chicks were distributed for joint chicken breeding. The two community groups in Desa Sungai Gelam II were provided with a total number of 1,400 chicks and the groups themselves contributed a total number of 153 chicks that were bought at the level of the village. A total 880 chicks were allocated for joint chicken breeding and the remaining number for individual chicken breeding activities. Community groups have appointed one of their members to act as the responsible person to take care of the group owned chicks. Profit sharing arrangements are planned to be discussed among community group members.

In Desa Air Hitam Laut, a heavy storm (in October 2004) provoked the death of approximately 50% of the total number of chicks for joint chicken breeding. After this, further technical support related to the construction of the poultry houses, but also care of the chicks was provided for by a chicken breeding expert from the University of Jambi. Chicken breeding activities in Sungai Gelam II developed without unexpected incidents. In that village, also a hands-on-training was organized (after the chicks were brought in).

A total of 4 hectares abandoned ('sleeping') agricultural land (2 hectares per community group) was cleared in Desa Air Hitam Laut for coconut farming and tree growing, respectively 0.75 hectares and 0.25 hectares. Village nurseries were established and a total number of 1,080 coconut seedlings were planted. Pinang palm (*Areca catechu*) seedlings were also planted provided for by the group members themselves. One community group developed electric fences around the community group land to prevent pest (rats and wild pig).

A training aimed to introduce community group members in tree growing, seedling preparation and nursery development and management was organized. A total of 13 community group members with interest in agro forestry activities have participated. Selection of tree species to be planted was decided through consensus among the group of participants.

Group members participating in joint tree growing decided to focus on planting of Meranti (*Shorea spp.*) and Jelutong, though different varieties (depending on soil conditions) for Desa Sungai Gelam II and Air Hitam Laut, respectively Jelutong (*Dyera spp.*) and Jelutong (*Dyera zibethinus*). In Sungai Gelam II, it was also decided to plant Pulai (*Alstonia spp.*) and Durian (*Durio zibethinus*). Availability of seedlings and market

conditions, including prices and market openness were main reasons to select these species. Village nurseries were planned to be established by the end of 2004. Both community groups appointed one of their members to act as responsible person for joint production, planting and maintenance of the seedlings.

5. *Monitoring*

In both pilot villages a workshop was organised to learn about the problems of community group members related to implementation of the income generating activities and to arrive at concrete lines of action to address the identified problems. In Appendix 3 an overview of the results of the two workshops is presented.

The results in both villages show that the high prices for chicks and feed in combination with high mortality rates seriously constrain the development of chicken breeding at village level. The results also show that development of a marketing strategy is indispensable for long-term success of chicken breeding activities at village level.

The results in Desa Air Hitam Laut show that large numbers of rats and wild pigs that live on abandoned agricultural lands is a serious constraint for coconut plantation development because they feed with seedlings and fruits.

Actions to be taken were formulated and project work plans and budgets have been revised accordingly.

6. *Awareness building and strengthening the exchange of information and experience*

During implementation of the activities, two study tours were organized for the participating community groups to learn from experiences in sustainable farming practices and tree farming activities in the region. Researchers working for AHL project have visited both research villages to share their knowledge with the community groups on water level management and nursery development. In both villages, meetings attended by all participating villagers and PINSE staff were regularly organised to share experiences and results.

3.2.1 Discussion

The community development process was quintessentially owned and driven by community groups, but the community workers did not try to understand the diversity among members within the community groups in terms of issues of gender, ethnicity and access to resources and decision-making, and how these differences affect quality of project outcomes. For instance, it is likely that the most disadvantaged residents of Desa Air Hitam Laut, especially landless people, have not benefited of project activities because contribution of land was a principal condition to participate in agricultural and agro-forestry activities implemented by the community groups.

4. Conclusions

4.1 General conclusions

The social economic research component of the AHL project was formulated and implemented to develop options for enhanced community involvement in the management of Air Hitam Laut river basin and Berbak National Park. The following general conclusions are based on the results of community based planning and action in Desa Air Hitam Laut and Desa Sungai Gelam II.

- The importance of peat swamp forests for rural livelihoods highlights the necessity of community based planning and action. The approach is in particular useful for linking local interests with global concerns such as biodiversity conservation.
- Community based planning and action addresses the immediate concerns and issues of local communities and encourages their participation in peat swamp forest management.
- Preliminary observations indicate that community based action and planning empowers local communities to improve their problem-solving capacity and build knowledge, skills and organisational capacity. However, the process takes time.
- Working through community groups at the village level provides an opportunity for communication and learning between participating villagers and between them and researchers, technical experts, forest officers and NGO staff.
- Development of successful marketing strategies for agricultural and tree products and livestock is indispensable for long-term success of the alternative income generating activities supported by the project.
- Development of closer partnerships between community groups and commercial companies is important to the development of tree growing at the village level (cf. Angelsen and Wunder, 2003). Companies have easy access to markets, capital, skills and technologies.
- Enhanced cooperation between local and regional levels and non governmental and governmental sectors is crucial for community empowerment to share in decision-making. This can be achieved by strengthening of existing platforms in the field of water resources management or establishing new ones for integrated resource planning at the river basin level with particular attention to representation of local communities.⁶

⁶ The new Indonesian National Water Resources policy aims to strengthen the insitutional setting and to build capacity in water resources management at national, provincial, ditrict and local levels.

4.2 Specific conclusions

4.2.1 Social and economic living conditions

- The Desa Air Hitam Laut community is more isolated than that of Desa Sungai Gelam II. Supply of portable water is a serious problem in both research villages. The level of other infrastructure facilities such as availability of means of communication, electricity supply, schools and medical centres are very poor in Desa Sungai Gelam compared to Desa Air Hitam Laut.
- Desa Air Hitam Laut residents value agriculture as the most important economic activity. In Desa Sungai Gelam II, oil palm farming is considered a major income generating activity. The production of food crops is little developed in that village and inhabitants mainly depend on the market to supply their needs.
- Livestock is considered in both research villages a minor income-generating activity.
- Fresh water fishing is considered in Sungai Gelam II a minor income-generating activity.
- The financial returns to coastal fisheries are considered low by Air Hitam Laut residents. Under these circumstances it is to be expected that fishermen gradually return to agriculture as their main source of income.
- Processing soybeans for *tofu* and *tempe* is considered in Sungai Gelam II an important income generating activity.
- There are limited employment opportunities for inhabitants of the two research villages, except working as labourers on oil palm plantations.

4.2.2 Socio-economic value of forest products

- In Desa Air Hitam Laut, forest products are primary used for subsistence and not for commercialisation. The residents of Desa Sungai Gelam II in contrast value forests products primary as a source of income, in particular the sale of wood and birds. This suggests that there is a relation between a lack of alternative income opportunities and dependence on use of forest products.
- Remaining peat swamp forest in the direct surroundings was until recently the main production area for wood harvested by Sungai Gelam II residents, but wood resources have become depleted, which implies a risk of increasing level of wood harvesting within the boundaries of Berbak National Park in the near future.
- In Desa Air Hitam Laut, peat swamp forest within and outside Berbak National Park is the main production area for commonly harvested rattan species and species for wood products. For food products (fruits and vegetables) and medicines secondary forest areas is the main production area. No forest products were recorded that are harvested on agricultural lands.
- Trapping of birds is an important income generating activity in Desa Sungai Gelam II.
- Desa Air Hitam Laut residents value highly the wood derived from Nibung (*Oncosperma tiggilarium*) for its contribution to cash income. This is also the case for the sale of products of rattan species and to a lesser extent the leaves of Nipah

palm (*Nypa fructicans*). Residents of Sungai Gelam II value latex derived from Jelutung (*Difera consulaca*) as a minor source of income.

- All economically important forest products appear to be destined for nearby markets, except of birds.

4.2.3 Key constraints and possibilities for community development

- Land is a crucial resource in both research villages. Access to land and soil conditions represent in Sungai Gelam II serious constraints to agricultural development. Low financial return of coastal fisheries in Desa Air Hitam Laut will affect land availability in the near future.
- Limited available capital, knowledge, skills and high costs to move products to markets are considered in both research villages as serious constraints to community development.
- Livestock development and development of fruit tree farming are considered in both research villages alternative income opportunities. In Desa Sungai Gelam II, this is also the case for development of pineapple and soybeans production, processing and marketing.

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Appendices

Appendix 1 Locally highly valued NTFP species

Appendix 1a Species with edible fruits, parts eaten as vegetables and medicines

| Name | Parts used | Destination | Production area | Availability | Village |
|---------------------------------------|-------------------|--------------------|------------------------|---------------------|----------------|
| Sirih (Piper betle) | Leaves | Home consumption | Secondary forest | High | AHL |
| Mengkudu (Morinda citrifolia) | Fruits | Home consumption | Secondary forest | High | AHL |
| Gadung (Dioscorea hispida) | Fruits | Home consumption | Secondary forest | Medium | AHL |
| Sampayo (Zalacca spp.) | Fruits | Home consumption | Secondary forest | High | AHL |
| Rambai (Lansium spp.) | Fruits | Home consumption | Secondary forest | High | AHL |
| Senduduk (Melastoma melaboriticum) | Leaves | Home consumption | Secondary forest | High | AHL |
| Bracken | Leaves | Home consumption | Secondary forest | High | AHL |
| Medang (Actinodaphne glomerata) | Bark | Home consumption | Secondary forest | Medium | SG |
| Pasak bumi | Roots | Home consumption | Secondary forest | Low | |
| Pulai (Alstonia scholaris) | Bark | Home consumption | Secondary forest | High | SG |
| Jarak (Racinus comunis) | Leaves, fruits | Home consumption | PSF, secondary forest | High | AHL |
| Pedada (Sonneratia spp.) | Fruits | Home consumption | Secondary forest | High | AHL |
| Durian (Durio spp.) | Fruits | Home consumption | Secondary forest | Medium | AHL |

| Name | Parts used | Destination | Production area | Availability | Village |
|------------------------------|------------|------------------|------------------|--------------|---------|
| Rambutan (Nephelium spp.) | Fruits | Home consumption | Secondary forest | Medium | AHL |
| Buli | Fruits | Home consumption | Secondary forest | High | AHL |
| Lempuyang (Zingiber spp.) | Shoot | Home consumption | PSF | High | AHL |
| Temu lawak (Curcuma spp.) | Shoot | Home consumption | PSF | High | AHL |
| Black turmeric Curcuma spp.) | Shoot | Home consumption | PSF | High | AHL |

Appendix 1b Species used for construction, furniture and equipment

| Name | Parts used | Destination | Production area | Availability | Village |
|------------------------------------|------------|------------------|------------------|--------------------------|---------|
| Pandan (Pandanus spp.) | Leaves | Home consumption | Secondary forest | High | SG |
| Rattan (Calamus aquatiles) | Wood | Local market | PSF | High | AHL |
| Nibung (Drymophloeus oliveaformis) | Wood | Local market | Secondary forest | High | AHL |
| Jelutung (Difera costulaca) | Latex | Local market | PSF | Medium (AHL) Low (SG) | AHL/ SG |
| Bamboo (Bambusa spinosa) | Wood | Home consumption | Secondary forest | High | AHL |
| Nipah (Nipa fructicans) | Leaves | Home consumption | | High | AHL |
| Pandan (Pandanus spp.) | Leaves | Local market | Secondary forest | High | AHL/ SG |

Appendix 2 Results of the village planning workshops

Desa Sungai Gelam II: lack of employment (men's group)

| Action to be taken | Possible groups involved | Local contributions | External support | Indicators for success |
|--|---------------------------------|----------------------------|-------------------------|--|
| Join forces among village residents | Oil palm plantation company | Land | Funds | Reduced unemployment at village level |
| Agricultural development (cassava, oil palm) | Governmental agencies | Skills | Technical expertise | Increased household incomes |
| Small-business development | (sub)district authorities | Labour | Equipment | Lower crime rates |
| Livestock development (chicken, ducks) | Technical advisors/experts | | | Increased food security at household level |
| Canalisation for agricultural development | Farmer groups | | | Reduced out migration |
| Development of cooperative | Neighbouring villages | | | |
| Health Service development | | | | |

Desa Sungai Gelam II: women's activities (women's group)

| Action to be taken | Possible groups involved | Local contributions | External support | Indicators for success |
|--|------------------------------------|----------------------------|-------------------------|--|
| Training in cassava (chips), soybeans (tofu, tempe) processing | Female headed households | Land | Funds | Increased household savings |
| Home industry development | Trainer/technical advisors/experts | Labour | Technical expertise | Better future for children |
| Marketing activities | NGO | | Equipment | Increased wellbeing |
| | Neighbouring villages | | Processing unit | Increased realization of household needs |

Desa Air Hitam Laut: pest (men's group)

| Action to be taken | Possible groups involved | Local contributions | External support | Indicators for success |
|---|--------------------------|----------------------|------------------|--------------------------------------|
| Establishment of hunter groups | Village authorities | Knowledge and skills | Funds | Higher agricultural production level |
| Construct electric fences | Farmer groups | | Equipment | Reduced number of nests |
| Poison and or hunt rats and wild pigs | Land owners | | Labour | |
| Hire hunters from outside the village | Landless people | | | |
| Clearance of abandoned lands (breeding place of rats and wild pigs) | NGO/ facilitator | | | |

Desa Air Hitam Laut: lack of financial means (men's group)

| Action to be taken | Possible groups involved | Local contributions | External support | Indicators for success |
|---|--------------------------|---------------------|--|--------------------------------------|
| Agricultural development | Farmers | Land | Funds | Higher agricultural production level |
| Livestock development (chicken, goats, sheep, cows) | Fishermen | Skills | Technical expertise | Increased knowledge |
| | Village authorities | Labour | Equipment | Increased wellbeing |
| Development of cooperative | Land owners | | Agricultural inputs (seed, fertilizer, pesticides) | |
| | Technical trainers | | | |

Desa Air Hitam Laut: lack of portable water (men's group)

| Action to be taken | Possible groups involved | Local contributions | External support | Indicators for success |
|-------------------------------|---|---------------------|------------------------|--|
| Create a public well | Village authorities | Land | Funds | Reduced number of patients suffering from water related diseases (diarrhoea) |
| Distribution of water filters | Farmers | Labour | Technical expertise | |
| | Fishermen | | Equipment | |
| Find fresh water source | Family Welfare Group (PKK) and other local groups | | Water storage facility | |
| | Technical advisors/experts | | | |

Appendix 3 Results of the village monitoring workshops

Appendix 3a Problem Analysis Chart

Desa Air Hitam Laut (mixed group)

| Chicken raising | | | Coconut farming | | | Crispy home industry | |
|---|---|--|--|--|--|----------------------|--|
| Problems | Causes | Opportunities | Problems | Causes | Opportunities | Problems | Causes |
| High labour investments to build poultry houses | Building activities planned and implemented in too short time | Discuss planning procedures with PINSE staff Poultry houses for individual households (women) | Pest (wild pig) | No fences | Construction of fences | Marketing problem | No middle men in AHL |
| Construction poultry houses does not fit daily routines | | | | Large areas of abandoned agricultural land | | | No buyer in Jambi for large quantities of crispy |
| Doubts on profitability | High investment costs High DOC mortality rate | Production of DOC (eggs) by community groups themselves | High external inputs: fertilizer and seeds | Lack of money Delay allocation project funds | Regular supply of fertilizers (2 times per year) and seeds | | Most villagers can and do make crispy |
| No shared responsibility for DOC ¹ maintenance | The responsible community group member does not involve other group members | Re-discuss agreements/rules (incl. profit sharing) | | High transportation costs versus low market prices | | | |
| High mortality rate DOC | Long travel distance (Medan-Jambi-AHL) DOC too young for transportation | | | | | | |

¹ DOC: Day One Chicken.

Appendix 3a Problem Analysis Chart (continued)

Desa Air Hitam Laut (men's group)

| Problems | Causes | Coping strategies | Opportunities |
|------------------------|---|---|---|
| Coconut farming | | | |
| Pest (wild pig) | Large areas of abandoned agricultural lands | Clearing abandoned lands | To construct electric fences around plantations |
| | Wild pig eat seedlings and fruits | Constructing fences around plantations | |
| | Wild pigs are abundant | Quarding plantations Killing pigs | |
| Bushes and weeds | Slow down the growth of coconut palms | Clearing bushes around plantations in traditional way | To use pesticides |
| | Become pig nest | | |
| | Too many wild pigs | | |
| Lack of fertilizer | Slow down the growth of coconut palms | Clearing bushes around plantations in traditional way | To use fertilizer regularly |
| | Lack of money | | |
| Canalization | High acidity | Construction of traditional canals | To construct traditional canals |
| Chicken raising | | | |
| DOC | Transportation (long travel distance) | Do one's best to take care of DOC | To produce DOC themselves |
| | Quality of the DOC | | |
| Chicken feed | Large travel distance | Rely on project support | To produce chicken feed themselves |
| | Weak skills to produce chicken feed | | |
| Transportation | High transportation cost | Rent transportation means | To obtain their own means of transportation |
| | Long travel distance | | |
| | Low accessibility (AHL) | | |
| Vaccine | Long travel distance | Rely on project support | To obtain a manual for the use of vaccine |
| High mortality rate | Long travel distance | Provide DOC with food and water | To learn more about chicken maintenance |
| | | Do one's best to take care of DOC | |
| | | Warm the DOC with lamp | |
| Lack of money | Delay allocation of project funds | Support the activity with own means | Expand farming activities |

Appendix 3a Problem Analysis Chart (continued)

Desa Sungai Gelam II (men's group)

| Chicken raising | | | Crispy home industry | | |
|---|--|---|--------------------------------------|---|---|
| Problems | Causes | Opportunities | Problems | Causes | Opportunities |
| DOC only available in another province (Medan) | Supply problem throughout Sumatra | Production of DOC by community groups themselves (breeding machines) | Marketing problem | <ul style="list-style-type: none"> • Low cassava production due to soil conditions • Supply problem: raw material (cassava) • High investments versus low market price | <ul style="list-style-type: none"> • Re-allocate budget for crispy home industry to chicken raising • Focus project support on chicken raising |
| Chicken feed and vaccine only available in cities | Transportation problems (especially in wet season) | <ul style="list-style-type: none"> • Production of additional chicken feed (cassava, corn) • Use of chicken manure for additional chicken feed production • Develop marketing of chicken feed and maintenance materials in village | Women's activity | Women produce crispy | <ul style="list-style-type: none"> • Increase women's involvement • Small scale activity (marketing in direct surroundings of village) • Support women in marketing problems |
| DOC maintenance | No veterinarian in village | <ul style="list-style-type: none"> • Learning by doing • Reading books, manuals • Learn more about chicken medication (vaccine) | Lack of interest among group members | <ul style="list-style-type: none"> • Low profitability • Marketing problem | |
| Materials for breeding machine | Lack of money | <ul style="list-style-type: none"> • To make facilities themselves (oil lamps) • Project support | Group-based cassava planting | Lack of interest among group members | |
| Marketing problem | No organised efforts | <ul style="list-style-type: none"> • Develop marketing of chickens • Project support | | | |

Appendix 3a Problem Analysis Chart (continued)

Desa Sungai Gelam II (women's group)

| Problems | Causes | Coping strategies | Opportunities |
|--|---|--|---|
| Chicken raising | | | |
| High mortality rate DOC & many DOC ill | <ul style="list-style-type: none"> No vaccine available Lack of knowledge on chicken diseases Low quality of chicken feed Acidity of drinking water | <ul style="list-style-type: none"> Use <i>rumah panggung</i> for poultry houses Learn from the experiences of other people Use <i>serbuk gergai</i> for poultry houses Paint the poultry house with <i>kapur</i> | Visits of chicken expert from Jambi to village |
| Lack of technical knowledge and skills to maintain DOC | Training organised by project too general | Learn from the experiences of other people | Visits of chicken expert from Jambi to village |
| Supply of chicken feed | <ul style="list-style-type: none"> Long travel distance to shops Transportation problems Lack of money | Use alternatives (rice, corn) | To cooperate with feed distributor |
| Supply of vaccine | <ul style="list-style-type: none"> Long travel distance to shops Transportation problems Lack of money | | To cooperate with vaccin distributor |
| Drinking water | Acidity | | To collect rain water To make an arterial well |
| Haze | Peat land fires | | To establish a village fire brigade |
| DOC distribution | Takes too much time to order DOC | Waiting | To produce DOC within community groups |
| Keep DOC warm (lamps) | No electricity | Use traditional lamps | To obtain a generator |
| Crispy home industry | | | |
| Supply of raw material (cassava) | Bad soil conditions (second year of production) | | |
| Marketing problem | <ul style="list-style-type: none"> Low demand No middlemen | | |
| Processing cassava | Lack of technical knowledge | | |
| High labour input | Large scale | | |
| High time investment | Time consuming | | |
| Low profitability | High production costs | | |

Appendix 3b Action plans

Desa Air Hitam Laut (plenary session): chicken raising

| Actions to be taken | Who will do it | Local contributions | External support | Best time to start | Duration |
|---|---|----------------------------|--------------------------------|---------------------------|-----------------|
| Re-discuss rules for profit sharing and other group rules if needed | CO ¹ (Novi) and CL ² (Armada) | Time | Experience Knowledge | September | 3 months |
| Discuss operational planning (incorporate risks on delays to avoid disappointment among members community groups) | PINSE, WI-IP, Project management | - | - | August | 3 months |
| Visits technical advisors to the village | PINSE | Time | Fees technical advisor | As soon as possible! | 3 months |
| Translation of manual on the use of vaccine | PINSE, WI-IP | - | Fees translator | As soon as possible! | - |
| Discuss opportunities and constraints of DOC breeding by community groups | Community groups, CO, CL and technical advisor | Time | Fees technical advisor | December | - |
| Discuss opportunities and constraints of chicken raising on an individual basis | Community groups, CO, CL and technical advisor | Time Experience | Fees technical advisor | December | - |
| Discuss opportunities and constraints of group-based chicken feed production | Community groups, CO, CL and technical advisor | Time | Fees technical advisor | As soon as possible! | 3 months |
| Discuss mode and planning of transportation | Community groups, PINSE staff and transport agency | Information | Invitation of transport agency | November - December | - |

¹ CO = community organiser (PINSE).

² CL = community leader paid by the project.

Desa Air Hitam Laut (plenary session): coconut farming

| Actions to be taken | Who will do it | Local contributions | External support | Best time to start | Duration |
|----------------------------|------------------------|----------------------------|-------------------------|----------------------------------|--|
| Construct electric fences | Rasikin | Labour | Funds | Early September | 2 weeks |
| Purchase of pesticide | Individual land owners | Money and labour | Funds | Depends on whether conditions | 5 days/year |
| Purchase of fertilizer | Individual landowners | Money and labour | Funds | Depends on distribution of funds | Two times per year for a total period of five year |

Appendix 3b Action plans (continued)*Desa Sungai GelamII (plenary session): chicken raising*

| Actions to be taken | Who will do it | Local contributions | External support | Best time to start | Duration |
|--|--|------------------------------|--|---------------------------|-----------------|
| Provide community groups with practical technical advice | PINSE, project management | Time Experience | Fees expert/ technical advisor | Last week of September | |
| Construction of second poultry house (Sumber Rejeki) | Community group, CO and CL | Time Labour | Funds and material | October | 2 weeks |
| Production of additional chicken feed | Community groups, PINSE and technical advisor | Time Labour Experience | Fees expert/ technical advisor | November | - |
| Collection of chicken manure | Members of community groups | Time Labour Tools | - | - | - |
| Production of DOC (breeding machine) | Community groups, PINSE and project management | Time Generator Labour | Lamps, breeding machine and fees technical advisor | September | Continuity |
| Discuss the opportunities and constraints of establishing a 'chicken' shop/cooperative at village level (Gaya Baru) | Community groups, PINSE and project management | Time Experience | Fees technical advisor | Still to be decided | - |