



RESIREA

Renewable Energy Sustainable Programs for Intelligent Rural Electrification and Poverty Alleviation

DETAILED STUDIES OF THE PRIORITY VILLAGES

Oudomxay province

SUMMARY REPORT

WP6

March 2009



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I- INTRODUCTION

1- *Context of the study*

After a provincial study carried out in Oudomxay in 2007, 23 priority villages have been identified in 3 Priority Zones: Xay, Houn North and Houn South.

These villages have been selected because they presented a favorable context for decentralized rural electrification projects, based on renewable energies.

The list of priority villages was presented during a workshop held in Oudomxay in March 2008 and validated with local actors.

Further to this selection, RESIREA partners launched the next phase of the project, consisting in in-depth analysis of the selected villages.

2- *Methodology of the survey*

Detailed data have been collected in each priority villages by the consultant Sunlabob, with the support of the provincial authorities.

A **village database** has been created, with data concerning:

- Accessibility;
- Geographical configuration and context;
- Living and housing conditions;
- Social context;
- Socio-economical context;
- Energy context.

An inventory of non-domestic users has been completed to identify social infrastructures (schools, health centers, offices, etc.) and economic activities (shops, crafts, etc.) existing in the priority villages.

Further to the completion of the village database, the priority villages have been scored basing on the following criteria:

- Accessibility,
- Economical dynamism: presence of activities generating income, of markets, etc.
- Social dynamism: presence of associations, development projects, etc.
- Good context: access to water, health care, education,

The villages have been shared into four categories, according to their more or less favorable context for a suitable development of a rural electrification project.

- **Category A:** village with good general environment, dynamic economy and good road accessibility. Other development projects are in progress, which offers potential for further development through electricity;
- **Category B:** village with good general conditions for the implementation of an off-grid electrification project. Economic dynamism is average, but social-economic development could be strengthened with an electricity supply;
- **Category C:** village favorable to off-grid electrification, with good social conditions, but with a relatively poor economy and a difficult access during rainy season;

- **Category D:** village with bad road access and/or relative poor economy, but with good geographic and social environment. Road constructions projects in some of these villages are scheduled and will make these villages less isolated.

Priority Zone	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D
Xay	TANGKOK	TA UEUG (Ta Ing) TANGCHALI (Nam Pa) CHOMKA	THOUTING CHOMSEN	PHEUN
Houn South	KATANGYA	NAMPHAOYAI NAMYUENG MAI	PHONEKHAM	MOKLAK MOKCHAAK KEO
Houn North	NAMPHOUN		KANG (Phouviengxai) MOKKACHORK	PHAYAM PHOU THONG CHONGNANG

Table 1: List of priority villages, per category A or B

Then, to get all the data necessary to the design of the electrification programme, surveys of the potential beneficiaries have been completed:

- survey of representative households;
- survey of social infrastructures and economic activities.

Methodology of the users' surveys:

Basing on the results of the village database, surveys have been carried out in representative villages, in terms of accessibility, and category.

10 representative villages have been selected:

- Tangkok, Tangchali and Pheun villages in Xay district,
- Katangya, Namphaoyai, Namyueng and Mokchaak in Houn South area,
- Namphoun, Mokkachork and Chongnang in Houn North area.

Within these villages, a sampling has been done to survey group of users that is the most representative of the targeted population.

The sampling of households was done basing on professions and housing conditions with cooperation of local authorities. All non-domestic actors present in the villages (shops, health centers, schools, etc.) have been also surveyed.

Thus, 177 households and 25 non-domestic actors have been surveyed in the three Priority Zones. For each Priority Zone, these surveys assessed:

- The traditional energy expenses (recharge of batteries, kerosene lamps, diesel gen sets, etc.)
- The electricity needs,
- The ability and willingness to pay of the population.

The results of the household's surveys have been extrapolated to the priority villages selected **in each Priority Zone, to define adapted energy services.**

They were presented during a workshop held in January 2009 in Vientiane. The detailed results of the studies are presented in the next section.

II- RESULTS OF THE VILLAGE STUDIES

1- Description of the targeted villages

1.1 Demography

In Oudomxay province, **1 530 direct beneficiaries** (families) are targeted in RESIREA programme, which is to say **10 200 people**. The electrification of social infrastructures like health centers, schools, will benefit to the population of the surrounding area, depending on these infrastructures.

Priority Zone	Village	Number of households	Population
Xay	CHOMKA	78	565
	CHOMSEN	55	384
	PHEUN	71	511
	TANGCHALI	68	561
	TANGKOK	119	856
	TEUM - Taeung	35	232
	THOUTING	66	468
HOUN NORTH	CHONGNANG	47	313
	PHAYAM	57	392
	MOKKACHORK	52	301
	KANG	89	549
	NAMPHOUN	56	370
HOUN SOUTH	MOKCHAAK	77	470
	PHONE THONG	44	385
	PHONEKHAM	75	383
	MOKLAK	90	557
	KATANGYA	114	654
	NAMPHAOYAI	57	362
	MAI	110	810
	NAMYUENG	112	713
	KEO	57	401

Table 2: Number of households and inhabitants in the targeted villages

On average, in the targeted villages, each family counts **7,5¹ persons**.

1.2 Accessibility

Access conditions are generally difficult in the targeted villages:

In Xay district, 2 villages are accessible all year long, 5 are inaccessible during rainy season and 1 village (Taeung) has no road access. During the dry season, the average access time to the district town is 2h30. The average distance to Xay district town is 55 km.

In Houn North area, one village has no road access (Phayam), one village is accessible all year long (Namphoun) and the remaining villages are served by dirt roads non passable during the rainy

¹ Source: Phase II of RESIREA WP6 surveys – households interviews

season. The average access time to the district town is 3 hours during dry season, 6 hours during rainy season. There are nonetheless road construction projects scheduled in 2008-2009, who should facilitate the access to Phayam, Mokkachor, Kang and Chongnang. The average distance to Houn district town is 27 km and 111 km from Xay provincial town.

In Houn South, one village has a road access passable all the year (Katangya), three villages have no direct access road (only paths), and 5 villages are served by road that are difficult to pass during the rainy season. The average access time to reach Houn district town is 3h during dry season and 4h30 during rainy season. The average distance to Houn district town is 31 km and 113 km from Xay provincial town.

Only Kang and Namphoun village in Houn North have access to telephone communications.

1.3 Configuration of the villages

For 11 of the 21 villages, the houses in the villages are grouped together. For the remaining villages, the population is scattered.

Maps for each village have been drawn to show the geographical configuration of the houses in the village. An example is shown below.



Figure 1: Map of Katangya village, Houn South area

1.4 Natural risks

The main risks are related to climatic events (flood and drought), insect disasters (especially in Houn District) and diseases that have impact on harvests and livestock.

2- Socio-economical analysis

2.1 Economic activities

The main economic activity in the targeted villages is **agriculture** (rice, corn, especially in Houn district, and sesame.), **stockbreeding and exploitation of Non Timber Forest Products (NTFP)**. 100% of the villagers practice agriculture and 29% of them get an additional income through the collection and sale of forest products, mainly cardamone.

The following activities can be found in the targeted villages:

- Shops and groceries,
- Craft activities with the production of baskets and wooden beds,
- Rice mills,
- Micro-credit organizations,

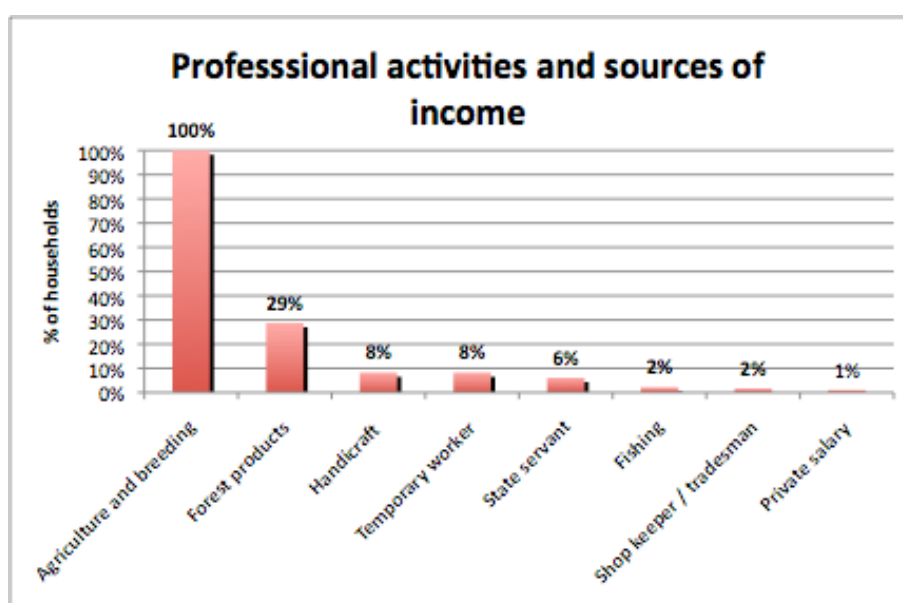


Figure 2: Professional activities and sources of income

2.2 Housing conditions

The type of houses can be described by three categories:

Description	Type of Roof	Type of walls	% of Households
Good houses	tin roof	cement wall	18%
Average houses	Zinc roof	Wood	44%
Poor houses	bamboo or grass	bamboo or grass	37%

Table 3: Housing conditions

Each house is composed of two rooms on average.

2.3 Expenses of the families

The distribution of the families' expenses is shown with the diagram below:

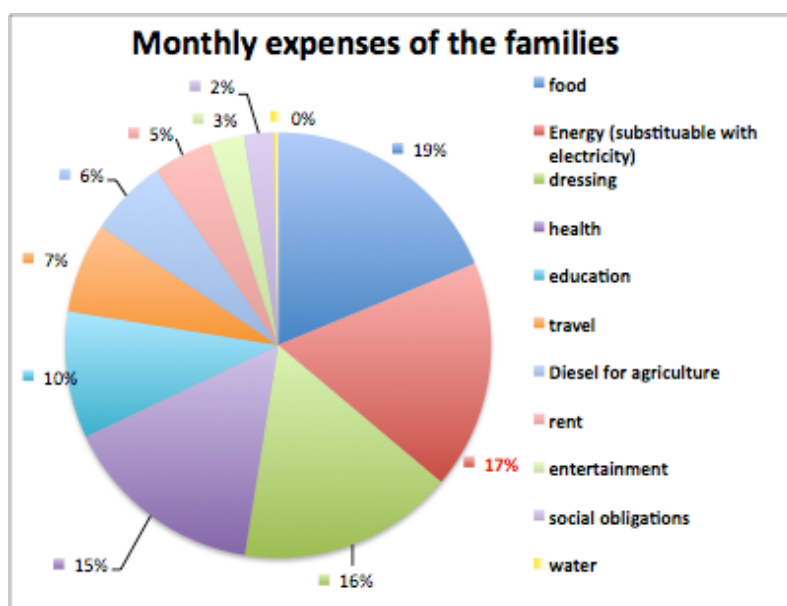


Figure 3: Distribution of the families' expenses

On average, each family spends **313,000 LAK** per month, that is to say **36 USD²**. The highest expense for the family budget is for buying food: it accounts for 20% of the total expenses. The second highest expense is energy (petrol lamps, candles, etc.), which counts for 17% of the total expenses.

52% of the interviewed households can make savings each month. This amount is saved mainly to buy cattle or in case of unexpected difficulty. The average income in the villages is **25 USD³**, knowing that most of the population is not involved in cash economy. As a consequence, this figure is not an indicator of the level of poverty. Some households indicated that they would be happy to enter a cash economy (by selling some cattle for instance) to get electricity.

2.4 Period of economic difficulties

The main period of ceremonies is **Tek Neum in November or December, which is a yearly festival**. Nevertheless, there is no de-capitalization of the households for these events: they don't go into debts at these periods.

Approximately 30% of the families meet economic difficulties during the period before the harvests, between July and October. This period lasts on average **3,5 months**.

2.5 Access to financial mechanisms

² Exchange rate (30/03/09): 1 USD = 8,580 LAK

Source of the data: Phase II surveys: households' interviews

³ Source: Village databases (Phase I)

6 villages have a Village Credit Fund managed by the Village Committee, borrowing at the rate of 2% to 4% per month. 2 of these villages in Xay district are supported by IFAD (International Fund for Agricultural Development) in the frame of Oudomxay Community Initiatives Support Project (OCISP). These loans are mainly dedicated to agricultural and breeding activities. In the villages where there is a credit fund, approximately **40% of the families are customers to the credit fund.**

3- Access to social infrastructures

All villages have a primary school. There is a secondary school in Tangkok village, in Xay district, which is electrified with solar panels installed by IFAD programme.

The average literacy rate of children in the targeted villages is **68%**.

2 villages have a health center: Kang village in Houn district and Tangkok village in Xay. For the remaining villages, the average distance to the nearest health center is 7.6 km.

There are also 9 village offices.

10 of the 21 villages have easy access to water, through head ponds, water tanks and pipes. For these projects, the villagers pay approximately 5,000 LAK for the construction and from 200 to 1,500 LAK per month for maintenance.

The remaining villages rely on rivers close to the village.

4- Socio-economical context

4.1 Local authorities

In each village, there local authorities are composed of the following groups:

- Chief of village and vice-chief;
- Elder group;
- Lao Women's Union;
- Village army or police;
- Youth group.

Laos is composed of more than 60 ethnic groups. This diversity is usually classified into three groups:

- Lao Loum gathering the groups living in the lowland valley areas, among them **Lue** group;
- Lao Theung or Midland Lao gathering the ethnic groups living in hills: **Khamu** people represents the main group in North of Laos;
- Lao Soung gathering highland population living in Northern provinces in Laos: **Hmong** people are the main group of Lao Soung.

In the targeted villages in Oudomxay, **70% of the priority villages are composed of Khamu ethnic group exclusively.** The remaining population belongs to Hmong people and in a smaller amount Lue ethnic group.

Generally, no conflict occurs in the villages excepted rare conflicts concerning the willingness of district authorities to move some villagers closer to the main road and some land ownership issues.

4.2 Community organizations

There is on average one community organization per village. The main activities are the construction and management of water systems, and secondly management of micro-funds for agriculture and breeding development. Other organizations promote agriculture, forestry and roads improvement.

4.3 Development projects

Some development programmes, carried out by national and international organizations, are in progress in the targeted villages:

- Development of infrastructures: roads rehabilitations, construction of water supply system, irrigation, school constructions, with OCISP - IFAD, ADB, UNDP;
- Agriculture and stockbreeding: trainings for new cash crops development, improvement of rice cultivation, micro-loans (IFAD, UNIDO, Department of Agriculture, Forestry Office and province authorities - DAFO) and implementation of industrial tree plantations (IFAD);
- Health improvement: village medical box, health education programmes, distribution of mosquito nets, with the Department of Health;

These operations are generally welcomed by the population, who takes an active part in their fulfillment.

4.4 Craft industries

The most widely spread craft activity in the targeted areas is the making of baskets and wooden furniture. In each village, almost half of the families are doing basketries as additional source of income or for self-consumption.

5- Energy context

5.1 Overview of the energy situation

10% of the interviewed households use a **diesel generator** or tractor engine for their electricity supply, **4%** for rice milling exclusively. The remaining **6%** use the diesel generator for both agricultural purposes at day-time and entertainment (TV- VCD) at night time.

93% use petrol lamps, which is in accordance with the national average. **6% use a water dynamo.**

31% of the shops interviewed use a diesel generator for running their business, which shows the important need of electricity for the development of activities generating incomes. However the increase of oil prices has a huge impact on the revenues of these economic actors: they spend on average **219,000 LAK per month for diesel**, which is to say **25,5 USD**.

Health centers in the targeted area usually use petrol lamps and candles for lighting and have no possibility to store vaccines and medicines.

Primary schools have no access to electricity, except two primary schools electrified by solar system.

The presence of technical competencies to operate electricity systems in the targeted villages is quite low, except in few villages where one can find a rice mills operator.

5.2 Traditional energy uses

Almost all households use petrol oil for lighting at night-time. **99% of them use small batteries** to supply an electric torch or a radio.

The durations for lighting are approximately **3,4 hours per day**, early morning (between 4h and 5h) and between 18h and 22h at night-time.

	Candles	Petrol lamp	Batteries for radio	Batteries for torch	Diesel generator ⁴
% of Households using	9%	93%	40%	99%	6%
Consumption per week per family	9 candles	0,3 l	1,5 battery	1,5 battery	3,6 l
Unit cost ⁵	1,500 LAK/unit 0,2 \$/unit	14,600 LAK/l 1,7 \$/l	1,575 LAK / battery 0,2 \$/unit		13,700 LAK/l 1,6 \$/l

Table 4: Traditional energy uses

5.3 Traditional expenses for energy

The average amount spent by the families for energy, that can be substituted by electricity⁶ is **54,600 LAK/month**, which is to say **6.3 \$/month**. This amount represents 17% of the total monthly expenses of the families.

In each priority zones:

	Xay	Houn South	Houn North
Traditional energy expenses in LAK/month	48,900 LAK	63,900 LAK	45,300 LAK
Traditional energy expenses in USD/month	5,7 USD	7,4 USD	5,2 USD

Table 5: Traditional energy expenses in the three priority zones

However, the following graph shows that the majority of the population (63 %) spend between **2,2 and 5,2\$ per month for energy expenses**.

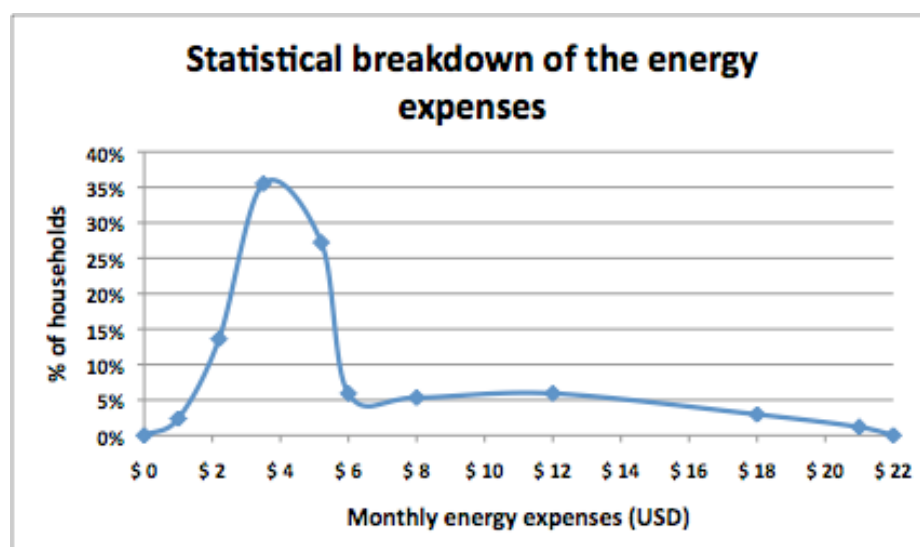


Figure 4: Statistical breakdown of the energy expenses of the households

⁴ The use of diesel in the engine for agricultural purpose exclusively is not included: the figures of the use of diesel are presented for entertainment only, at night-time.

⁵ Unit costs have been evaluated during the households interviews.

⁶ Expenses that can be substituted by electricity: for candles, petrol lamps, small batteries, diesel that is used at night time for entertainment purposes.

This shows that energy is an important issue for the interviewed households and that they have a **relatively high capacity to pay an electricity service**, which would substitute the use of batteries, petrol lamps and diesel generators.

5.4 Energy demand

During the surveys, the energy demand of the households and typical non-domestic users has been analyzed.

The type of appliances and their number has been reported, together with the duration of use per day of each appliance. For households, electricity would supply in priority lamps, radio and color TV. Considering lighting, the average number of lamps demanded is **1,8** and the average duration of use is 2,6 hours per day.

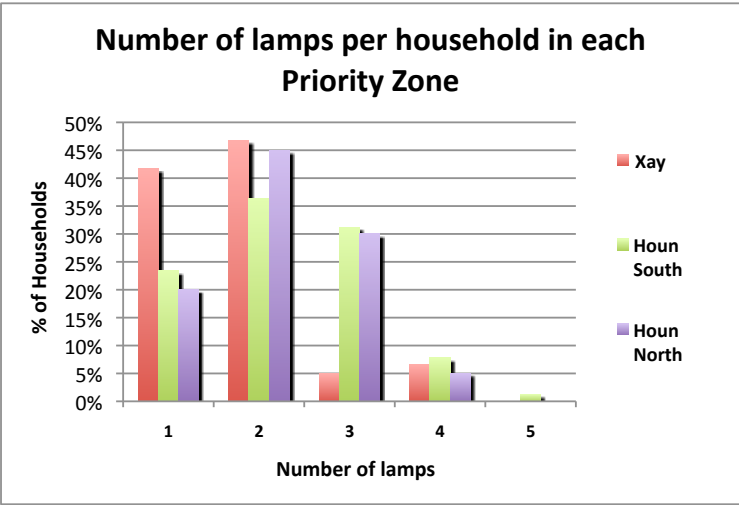


Figure 5: Number of lamps per household

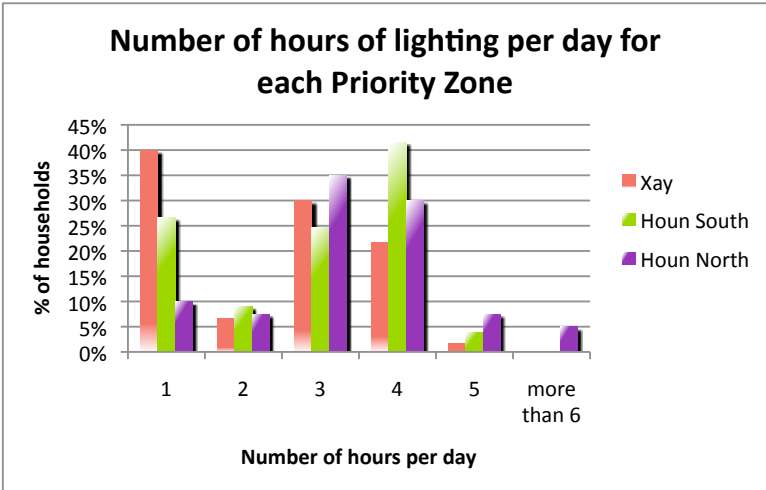


Figure 6: Number of hours of lighting per day per household

The analysis of the current energy uses for lighting (petrol lamps, candles), crossed with the survey results shows that the usual period of use are mainly at night time, between 18h and 22h, and in the early morning, between 4h and 6h.

Considering the other appliances asked by the interviewed households, the following table summarizes the average data obtained:

	Average number per household	Average duration of use per day	Period of use
Radio	0,2	1,3	Early morning Midday Evening
Outside night lamp	0,4	1	Night
Tape player	0,02	0,1	Midday Evening
CD player	0,1	0,2	Midday Evening
Black and White TV	0,02	0,1	Midday Evening
Color TV	0,4	1,5	Midday Evening
VCD or DVD	0,2	0,9	Evening
Food processor	0,02	0,03	Midday
Fridge	0,03	-	-

Table 6: Analysis of the energy demand

5.5 Willingness to pay electricity

The surveys on the willingness to pay connection fees and monthly fees gave the following results:

	Xay	Houn South	Houn North
Average connection fees that households are ready to pay in one or two times to get electricity	219,000 LAK 25 USD	305,000 LAK 35 USD	225,000 LAK 26 USD
Average monthly amount that households are ready to spend for electricity	10,000 LAK 1.2 USD	18,500 LAK 2.2 USD	20,600 LAK 2.4 USD

Table 7: Willingness to pay connection fees and monthly fees

These figures are lower than the traditional energy expenses, because the interviewed households had usually no precise idea of the amount spent for energy each month.

This also indicates that the first expectation of the interviewed households with access to electricity is to reduce their energy bills each month.

6- Support of local authorities for electrification projects

Village and district authorities consider electrification as a key factor for the socio-economic development of their locality. According to the authorities, the priorities for the access to electricity are first households, then schools, community places and offices, and health center in this order.