

General Report no. 5, GR 5

Inception report
including a
Brief review of the Shifting Cultivation Research Sub-programme and
recommendations for future research

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
BTK	Ban Thong Khang
DAFO	District Agricultural & Forestry Office
DoF	Department of Forestry
EC	European Community
FSP	Forage for Smallholders Project
GTZ	German Technical Co-operation
IBSRAM	International Board for Soil Research And Management
IRAP	Integrated Rural Accessibility Planning project
IRRI	International Rice Research Institute
LSFP	Lao Swedish Forestry Programme
NTFP	Non Timber Forest Products
PAFO	Provincial Agricultural & Forestry Office
SCRP	Shifting Cultivation Research sub-Programme
SIDA	Swedish International Development Agency
TOR	Terms of Reference
TOT	Training for Trainers

1. INTRODUCTION

This inception report combines the experiences gained during a two months short term consultancy for the Shifting Cultivation Research Sub-Programme (SCRP) and the first two months of working as long term Agricultural Research Adviser in the same sub-programme. The consultancy took place in a two month period carried out in the period from 1 September - 30 November 1997 and included work with all of the sections of the SCRP though most time was spent with the staff of the experimental unit. The aim of the consultancy was to support ongoing tasks of the sub-programme, provide recommendations and to use these experiences as a basis for a long term involvement as Agricultural Research Adviser.

The day-to-day activity report (Annex 1) provides information on the daily activities undertaken during the consultancy. Considerable time was spent on familiarising with the sub-programme, attendance of two advisers' meetings in Vientiane, participation in two workshops in Luang Prabang, training of project staff on scientific data analysis and report writing and provision of assistance to the Project Director in data collection and writing a paper for presentation at an international workshop in Vientiane. Some of these activities were not anticipated and were not included in the Terms of Reference (Annex 2). The original TOR was thus used only as a guidance and consultant support was given to other more urgent day-to-day activities as well, as requested by the Sub Programme Project Director on a needs basis.

This report will describe the findings of the consultant with regards to work with the experimental - and descriptive research sections as well as with the demonstration unit. The report provides a brief review of the present activities of the SCRP and gives suggestions and recommendations for potential improvements of the present programme and for the future direction and content of research. Some potential inputs of the sub-programme in the model and methods development activities are described as well.

A draft of the consultancy report was produced in December and commented upon by the Project Director. This final version was subsequently edited and updated based on additional experiences gained during the first months of working as long term adviser.

2. EXPERIMENTAL RESEARCH

2.1 Introduction

The experimental research unit currently consists of 7 staff each of them are assigned the responsibility for the management of trails of different crops or silviculture species, i.e. corn, upland rice, legumes, silviculture and cotton. The experimental research takes place mainly on-station but also at selected on-farm sites along the road within 2 - 3 km of the station. In addition, the sub-programme supports the implementation of trials supervised by district staff of all seven target areas and one NBCA. The on-station research is basically carried out at two locations one close around the research station and one at a new site about 1 km South west of the station. The soils around the station are Ferralsols while the new area consists of a mixture of Alisols, Haplic Acrisols and Haplic Luvisols. Soils studies of the project area were performed by the Dong Dok Soil and Classification Center in 1991 and 1997. In the study in 1991 the whole of the Thong Khang sub district was studied and a report plus soil map were produced both in Lao and English. In the 1997 study the soils of the new area were studied in detail as well as selected on-farm sites, but no maps or translations of the report in Lao were produced. So far the soil studies have not been used extensively in the research work.

2.2 Experimental Research Activities 1992-7

2.2.1 Selection and design of experiments

The on-farm & on-station trials carried out from 1992-7 by the SCRP at Thong Khang and in the districts are presented in Annex 3, 4 and 5. In total 80 (68 on-station and 12 on-farm) experiments were managed by Ban Thong Khang staff. On-farm trials supervised by district staff have been ongoing for two cropping seasons now and have comprised of a total of 79 (28 in '96, 51 in '97) trails. Most of the experiments were carried out with annual crop species (i.e. 72 % of trials done at BTK) and the majority of these involve the comparison of varieties. The results from these trials can be used to assess the suitability of crops and varieties for the different geographical areas.

The sub-programme has done some initial work on the testing of sustainable upland farming technologies, like improved fallow systems, alley cropping, legume intercropping and crop rotation. These systems have found little or no acceptance with farmers so far due to a whole range of constraints. Subsequently more priority was given to doing field crop research on a range of annual cash crops and on the testing of varieties as the results of these trials would be more direct applicable. The activities that are still ongoing with respect to sustainable upland cropping technology development are the maintenance of a variety of legumes established in 1994. It is intended to use these legumes in improved fallow trials in the 1998 rainy season. The extensive experiments done with legumes and forages from 1992-6 can provide a good basis for future testing of these species in cropping systems with the major crops rice and corn.

The selection criteria for the choice of experiments to be performed was based on the crops presently grown in the area and for which farmers showed interest, crops for which there might be a market potential, and

crops that have been experimented with in the past. Adviser and staff assessments have played an important role. Most of the on-farm trials are replicates of trials performed on-station. Each of the participating districts however is free to choose their own set of trials based on local priorities. During the cropping season and after completion of the trials, farmers are involved in evaluation of the experiments.

These on-farm trials are very useful in testing on-station technology at farmer level and in achieving reasonable quick results. With the staff experiences gained it is advisable that in addition to these trials participatory technologies are further developed which enable more farmers involvement in the selection of relevant research topics and in implementation and evaluation of trials. This is especially relevant when the sub-programme is going to be more involved in more complex cropping/farming system research and in the development of sustainable upland farming technologies. The lessons learnt from these experiments could then be used to refine further experimenting.

In some trials the design was not optimal. Fruit and wood tree species grown in observation trails with the objective of comparing growth potential i.e. were planted with the same planting distance on one of the few flatter sites more appropriate for annual cropping. The tree species that were compared included slow and quick growing species in the same trial. Better would have been to plant them using optimal planting distance for each of the species according to literature or experience in the country, to group them depending on use and to plant them on more hilly land.

2.2.2 Trial management

In general the management of the trails was quite good. Boards, providing basic information on the experiments were present in each of the research plots as well as wooden markers indicating the borders of the treatments. Weeding in general was carried out in time and fences around the station were properly maintained, keeping the animals out of the research plots (a major problem in some other research work in Luang Prabang). Data collection took place by the staff responsible for the experiment and plot and crop information were recorded in a hard book document. Trials were in general done in three or four replications using a standard RCB design which seems appropriate for this type of research. Staff have through the years acquired considerable experience in doing experimental research and their performance compares favorably with those of other institutions and projects performing agricultural research. This is, as well as the Lao ownership and management of the project, one of the major achievements of the project so far.

2.2.3 Soils

A number of 1997 experiments were not successful due to a combination of drought and poor soil fertility. The rainy season in 1997 started very late and the rainfall was irregular, which probably can be contributed to the "El Nino" effect. The experimental area around the station has been cropped continuously for a period ranging from 1 - 4 years, without receiving much nutrients in the form of manure or fertilizer. The soils of this experimental area are characterised as Ferralsols and are acid and quite low in nutrient content. The frequent cropping has led to a depletion of nutrients. The soils of the newly acquired area Southwest of the station consist of different soil types which are marginally (Acrisols and Alisols) to reasonably more fertile (Luvisols) and better suited to upland cropping. These soils were previously cropped with rice and corn and have been laid fallow since for a period of only two years. The area was provided to the station by farmers upon request who considered the plots not yet ready for cultivation. Currently the area encounters serious problems with Imperata grass and *Mimosa pudica* weed infestation.

The soils (Ferralsols) on which almost all of the fields crop experiments have been carried out are not representative of the soils in the Nane watershed, as they comprise only 2.4 % of the total area (Table 1). The new area where a majority of soils are Acrisols or soils related to this soil group, are more representative for the soils in the area. The land suitabilities for growing upland crops however are quite similar for both soil groups thus trial results will have a wider applicability.

Table 1. Major soils and their distribution of the 14 villages in the B. Thong Khang area

SOIL TYPE	AREA (%) ¹
Rocky (not suited for agriculture)	22.4
Acrisols	41.7
Cambisols	31.7

Ferralsols	2.4
Calcisols	0.8
Gleysols	0.7
Fluvisols	0.3
TOTAL	100

2.2.4 Reporting

The experiments carried out from 1992-5 have been described in an extensive Lao report by the experimental staff which was completed in March 1997. This report is being reviewed with help of the consultant. The report is well structured and contains the objectives, material and methods and the results of the experiments in table form.

In some experiments data are missing or tables can be improved but in general experiments are well described. What is missing is a discussion and analysis of the results, conclusions including extension recommendations and recommendations for future research.

The consultant performed some on-the-job training for staff of the experimental unit on data analysis, improved report writing and formulation of conclusions. Upon request some training on statistical data analysis was performed as well. Staff are currently upgrading the report and will present the improved version in the dry season of 1998 after which the results and recommendations will be presented in a workshop and future research topics can be discussed.

2.3 Recommendations

Based on the observations made in 2.2, the following improvements and recommendations can be made with regards to methods of experiment identification, topics for future experimental research, trial & fertility management and staff training.

2.3.1 Research methods

It is advised to:

- do more on-farm trials and promote methods of more active involvement of groups of farmers in on-farm & on-station research. This could be enhanced by (i) the input of a short term consultant performing a practical field training and by producing guidelines on village participation (ii) by setting up a group of respected and knowledgeable villagers who could provide feedback, advise, comments and suggestions for experiments to be carried out. Enhanced farmer participation could lead to a set of experiments consisting of a mixture of researcher and farmer designed trials. These types of trials will be especially useful when experimenting with fertility, weed and soil conservation management.
- perform on-farm trials at different elevations, with the three main ethnic groupings and at different soil types more representative of the major soil types in the area. Use should be made of the soil studies available.
- request the Soil and Land Classification Centre to: (i) produce a soil and land suitability map based on the existing 1997 study (ii) translate a summary of this report into Lao. and (iii) provide training to staff in how to use the soil report in appropriate trial site selection.

2.3.2 Topics for experimental research

It is advised to put more emphasis on cropping/farming system experiments by making use of the results from the single annual crop experiments. A lot is known already on the suitability of the individual crops and it is time now to combine the different elements into appropriate cropping systems by testing relay cropping, intercropping, mixed cropping and rotation of a number of crops. When designing trials, marketability of crops and labour requirement should be taken into consideration.

The currently most common upland cropping system around the station consists of the cultivation of annual

crops (mainly rice and some corn) for a period of one (and sometimes two) year followed by a 3 - 5 year short term fallow. The experimental research therefore ought to focus on improving this system, inclusive of the fallow period, and strive for the incorporation of legume, tree & livestock components in the farming system. It is not recommendable to experiment with systems which promote permanent annual cropping like alley cropping or continuous rice or cash crop cultivation, as in the long run these systems are not sustainable without the use of external inputs. Current access to land also does not require intensification up to the level of permanent annual cropping.

The more long-term experiments, those which involve a large number of entries and those in which farmers currently show little interest, can be done on-station while the simpler shorter term trials can be performed on farmers' fields. The more detailed experiments on cultural methods with spacing, seed rate, planting dates etc. for each of the cash crops can be scaled down as already a lot is known from previous trials and as trial results on-station have only limited applicability due to large variability amongst farms. It would be better to assist farmers in the process of doing this refined testing on their own farms. The extension and shifting cultivation research subprogrammes could be involved in this.

A more comprehensive overview of interesting research topics can be obtained after review of all experiments done by the station. However a selection of the following research topics related to weed & fertility management, conservation farming and cash cropping seem worth exploring either in collaboration with other institutions/projects or by the sub-programme on its own:

Weed management:

- testing the effectiveness of various cover crops in reducing weed incidence by intercropping them with the fruit trees planted in the newly established fruit tree observation trial at the station
- testing methods to effectively control Imperata grass
- experimenting with relay cropping of legumes (i.e. black bean, pigeon pea) in corn & rice also with regard to fertility management

Fertility management:

- experiment with improved fallow systems: compare different rotations of legumes (like pigeon pea, Tephrosia and Crotalaria) and corn/rice with natural fallow, rice & corn monocropping.
- testing practical ways of collecting and using of animal/green manure with upland crops
- collect information on indigenous legumes that might be useful in improved fallow systems
- experiment w. P-fertilizer, lime application
- experiment with the rotation of rice/corn with cash crops

Conservation farming:

- experiment with simple conservation farming techniques on steep slopes on which permanent cropping is practised like: application of mulch lines along the contour, shallow ditches along the contour

(New) cash crops:

- experimentation with new annual cash crops like job's tears & ginger and continuation of work with sesame and cotton and try to devise ways to fit these crops into the current cropping systems;
- continue experimentation with paper mulberry and teak and add intercropping trials with annual crops
- experimentation with cultivation of other commercially interesting NTFP's that can be established as a fallow crop (i.e. cardemon, broom grass, rattan, "mak khen")
- experiment with quick establishment of living fences

Demonstration plots:

- set up a demonstration plot with conservation cropping that might include paper mulberry, pineapple, contour planted rice/corn + living fences
- demonstration plots of long-term rice, corn and/or cash crop intercropping with permanent tree crops like teak, paper mulberry, coffee, bamboo, kapok, fruit trees etc.
- demonstration on integration of large livestock or pigs & upland cropping at the demonstration site

It would be worth discussing with the various agencies active with upland farming in Luang Prabang province (IRRI, IBSRAM, EC, FSP, DAFO/PAFO) on how the present research on sustainable upland farming could be

coordinated in order to form a comprehensive package beneficial to all. The workshop on conservation farming tentatively planned for the 1998 dry season could be a good opportunity to do this.

Except for the present data collected on yield, pests, crop performance etc. it is recommended to include data on labour and inputs broken down per agricultural activity and to include a more elaborate evaluation of the experiments done by farmers for on-farm trials. A crop budget analysis could be done when comparing different crops/systems.

In addition to this it will be very useful to have access to data on market prices for annual & tree crops at different locations (farm, district, province) to be able to evaluate market prospects for these commodities and to adjust crops to be included in the cropping system research accordingly. This data requirement could be discussed with the DAFO's, & PAFO, extension training centres and potentially other projects operating in Luang Prabang and jointly a plan could be worked out for regular data collection and analysis. The demonstration and/or descriptive research units might be able to be involved in this exercise.

2.3.3 Improved trial & fertility management

Trail management can be improved by:

- making a map of the experimental area with a coding given to all experimental plots
- making a small sketch of each of the trial areas with the layout of the treatments.
- treating wooden markers an anti-termite spray to reduce insect damage.
- including clearly marked paths in the design of for the larger experimental plots

The problem of poor fertility and low pH of most of the currently used on-station experimental areas can be tackled through:

- selection of more on-farm sites with better fertility
- selection of experimental sites with an existing bush fallow of 3-4 years and/or obtain additional village land with the required fallow vegetation
- make a long-term planning which includes improved fallow/green manuring and appropriate crop rotation
- use a combination of animal manure (5 -10 t/ha) and limited amounts of chemical fertilizer
- experiment with liming (0.7 - 1 ton limestone/ha) and P-fertilizer (i.e. rock phosphate if available or otherwise superphosphate: 30 kg/ha) on the most acid soils
- apply large amounts of green manure (10 ton/ha) and return crop residues as much as possible

2.3.4 Staff training

Though no training needs assessment has been done the following training's have been identified which could benefit the staff of the experimental unit:

- training on data analysis, report writing and crop margin analysis
- training on the methods to establish demonstrations
- training in the cultivation of less common field crops like sesame, ginger, legumes, and of commercial fruit trees like citrus and litchi
- training on methodologies on how to involve farmers more in on-farm & on-station research
- training on theory & practise relevant to sustainable upland cropping (nutrient cycling, soil management, conservation & integrated farming), farming systems research etc.
- training on TOT (trainer for trainers) for staff involved in knowledge transfer (demonstration unit, experimental research training). Staff at the department of irrigation organize good courses.

Some of these training's could be performed by the Agricultural Research Adviser and have already been provided within the first two months' consultancy, other training's could be provided by agricultural institutions and resource persons in Laos and abroad. Participation in study tours and provision of appropriate documentation material including videos in Thai and/or Lao could be additional methods to increase the competence level of staff.

2.3.5 Documentation & dissemination

One of the objectives of the research is to disseminate its research findings in the form of papers, reports, workshops etc. The project staff have participated in a number of workshops in Laos and abroad and have

shared here their knowledge, the documents produced by the project both in Lao and English however, have not been widely distributed partly due to the long approval process at the DoF. This is a pity as there are a lot of projects active in agricultural development in the uplands who could benefit from the published information. It is recommended therefore to put more effort in disseminating information to interested parties and to allocate funds for translating interesting reports from Lao to English and vice-versa.

The reports of experimental research results from 1992-5 and 1996-7 are presently being finalized. After analysis, it is advised to produce a summary report both in Lao as English in which the major conclusions, findings and potential recommendations are to be described. A presentation by project staff to interested agencies in Luang Prabang and the extension sub programme of the LSFP could be held as well to inform them on the research progress. This report together with all other useful papers and reports that have been produced by the project in the past should be added to the existing list of project publications. This list can then, after clearance by DoF, be sent to a large number of interested projects and agencies in the country who would be able to order copies.

3. DEMONSTRATION UNIT

3.1 Introduction

The demonstration unit is in charge of the maintenance of the integrated farm at the Ban Thong Khang resource centre and is involved in the following activities:

1. integrated pig- fish farming demonstration site
2. pig farm demonstration site with improved pig breeds and cross-breeds; production of piglets
3. vegetable production/demonstration in the dry season
4. fruit & forestry nursery production for distribution to farmers and projects; production of 7,000 seedlings in 1996
5. traditional cow raising

The nursery confines itself to the production of fruit and forest tree seedlings based on the needs in the on-farm & on-station research, demands from farmers around the station (currently mainly lemon and litchi) and on orders placed by development projects in Laos. Currently i.e. coffee seedlings and strawberries are produced respectively for the GTZ project in Luang Namtha and EC Luang Prabang project.

The demonstration facilities are used for the training of students from different agricultural & forestry schools but are otherwise underutilized at present. In the former phase when the sub-programme was involved in extension more intensive use of the demonstration facilities were made. The resource centre is visited quite regularly by projects, but the number of training's organized by staff of the centre based on requests of agencies and projects in the country is limited nowadays. A lot of the activities of the demonstration unit are therefore more aimed at production than on demonstration purposes. There is a good integration between cropping and livestock components at the farm. Only some of the pig feed has to come from outside.

The soils at the integrated farm are Calcisols. These soils, which are moderately alkaline (pH = 8) are not representative for the B. Thong Khang area, as they only represent 0.8% of the total area. Only shallow rooted crops like vegetables perform well here. As this area is the only one with limited irrigation facilities at the station, it is used for dry season vegetable production & demonstration and as a site for producing fruit and forest seedlings. The staff are studying the possibility of establishing another demonstration site at the newly acquired area with more suitable soils for annual and permanent cropping. This site is further away from the livestock and fishpond demonstration site and needs improved road access. If this area could be developed it could become a demonstration site for sustainable upland crop production.

3.2 Recommendations

The quality and use of the demonstration facilities can be enhanced by:

- promotion of the use of the demonstration & training facilities at the resource centre. This could be achieved by producing a small booklet on the kind of training & demonstration services that the Ban Thong Khan resource centre is able to provide and disseminating this to agencies in Laos involved in

agricultural upland development and to the other sub programmes of the LSFP.

- produce information material on the different demonstration activities carried out at the centre which include data on inputs (incl. labour) and production of the comparative treatments and recommendations for extension. Data collected from experiments carried out in previous years could be used. The information material produced could be used in training of staff of the Extension & Training centre on methods of how to document and set up demonstrations
- the pig-fishpond and pig breed demonstration sites could be more integrated with the cultivation of crops by growing pig feed like corn, pigeon pea or cassava on areas near the demonstration farm as has been done in the past. The slurry from fishponds and pig manure could be used for fertilizing crops. The amount of pigs raised should be limited to the ones necessary for demonstration and breeding purposes
- the cattle are currently raised under traditional management. Methods of improved cattle raising could be demonstrated by raising cattle during the day in the forest and at night at a stable near upland fields where additional cash & carry feeding of livestock takes place and manure can be collected for use in upland fields.
- the vegetable cropping is aimed more at production than at demonstration. In addition to vegetable cultivation for production purposes it would be useful to demonstrate good quality vegetable production on small areas and suitable soils. The application of appropriate methods of bed preparation, mulching, spacing etc. could be demonstrated. A cropping plan and map of the vegetable area could be produced and data collected and analysed on crop inputs and outputs.
- a number of upland cropping demonstration sites as suggested in 2.3 could be established

4. DESCRIPTIVE RESEARCH

4.1 Introduction

Presently the descriptive research unit is active in the following areas:

- study of land use, socio-economic and environmental conditions in the Nane watershed area
- comparative study of the land use, socio-economic and environmental conditions of 7 target areas
- comparative study of the land use and development prospects of the 11 districts of Luang Prabang province
- special studies on technological, socio-economic and environmental topics to aid in research and extension work (i.e. the non timber forest product study in the Nane watershed)
- shifting cultivation analysis
- analysis and write reports on activities performed in phase III of the LSFP (agricultural extension, revolving funds, forest conservation, etc.)

The consultant provided some ideas on additional data collection in the Nam Nane watershed study and assisted in methods to summarize the survey form data provided by DAFO's in the comparative study of Luang Prabang province.

Presently the descriptive research is carried out by staff who were involved in extension activities in the former phase and were assigned to descriptive research activities since 1996. They have a diploma level education at most and have limited research experience and analytical skills. On the other hand, they have a lot of field knowledge and are very practically oriented. The work is still very much dependent on adviser support in identification of research methods and data analysis and assistance is needed in report writing. Despite some of these constraints, a number of studies and reports have been completed and presented at (international) workshops and seminars and a large number of short analytical reports on evaluation of activities performed in the former phase have been produced in Lao language.

There is room for more integration of the work of the experimental and descriptive research. The experimental research is doing quite detailed cropping experiments while the descriptive research has a very broad mandate of studying land use & socioeconomic features on watershed, target area and district level.

The outcome of the study of the 11 districts of Luang Prabang province will be of relevance for the province, but less so for the LSFP as only two target districts lie within this province. Recently EC and IRAP (Integrated Rural Accessibility Planning) projects have started collecting detailed socio-economic data at village level in most of these districts. This leaves scope for reducing inputs into this study.

The special studies and the Nane watershed study will be useful as outputs here are more directly linked to

development and extension. The report of the Nane watershed study done by project staff can be combined with the ongoing research of the Swedish University of Agricultural Sciences as it targets the same area. This combined research can be of mutual benefit and staff can learn by co-operation with foreign scientists. Outputs in the comparative studies of the target areas are presently of a quite general nature and this study will require considerable adviser input as data collection at district and village level is of a very rudimentary nature and data on soils, climate, land use etc. are usually not available.

4.2 Recommendations

It is advised to:

- focus the target area and district studies *geographically* and limit it to the three northern target district in which the LSFP works and link them more with the experimental research and the model building activities in cooperation with the extension, land allocation and conservation sub-programmes.
- focus the *content* of the target area and district studies by concentrating more on issues related to land use and shifting cultivation which can produce reasonable quick results and which can be readily used in land use, extension and experimental research programmes. Such case studies could investigate i.e. some of the following topics:
 - the market potential for cash crops;
 - cropping systems in watershed;
 - land area requirements per capita to do sustainable agriculture at different soil and agro-ecological conditions;
 - analysis of adoption/non-adoption of "improved technology" (improved corn variety, conservation farming) by farmers;
 - agricultural problems identification;
 - study of farmer practises in cultivation of "new" crops (paper mulberry, ginger, job's tears);
 - land use changes after land allocation;
 - indigenous farmer experimentation;
 - participatory technology development (i.e. paper mulberry); Other interesting topics could be identified by the extension, land allocation/land use planning and conservation programmes.
- try to get additional senior staff assigned to the descriptive research unit to assist in analysis and report writing
- provide training on design of case studies including sampling & interview techniques, data analysis and report writing; some of these trainings can be provided through an input of a short term consultant
- complete the Luang Prabang district study by summarizing and analyzing the data presently collected and presenting this in a report
- produce English summaries of the Lao reports
- by focusing the activities of the descriptive research unit some time will be available for inputs in the model development activities and additionally some extension activities

5. MODEL & METHODS DEVELOPMENT

It is anticipated that the shifting cultivation research sub-programme will also be actively involved in the model development activities to be piloted at a small number of target villages. During the third quarter of 1997/8 it will be decided by the subprogrammes and districts on which method development activities to focus and in which so called "demonstration villages" these methods will be tried out. The exercise will be a coordinated one between the LUP/LA, extension, shifting cultivation research and/or conservation sub-programmes. The methods to test in some of these villages with regards to the SCRP could be the on-farm testing of technologies addressing agricultural constraints identified by villagers. In the uplands this could involve the development of sustainable upland farming techniques.

In addition to this, some extension/on-farm research roles could be given to staff of the descriptive research unit in these selected villages targeted for model development. These extension activities would be the ones linked to the research activities and would provide knowledge on the causes of adoption/non-adoption of improved upland farming systems. This learning process of joint experimentation with villagers will lead to a constant refinement of research and will increase chances of joint development of locally appropriate and accepted upland farming technologies.

Method development has been defined as methods on how to do things (SIDA's Advisory Group Report,

March 1997). If we stick to this useful definition than this sub-programme, (with potentially some support from the extension staff), might be able to document some of the following methods development activities, during the rest of this phase:

- methods on identification of research topics using participatory techniques
- manual on how to perform on-farm and on-station field trials
- methods on documenting and analysing agricultural research experiments
- methods on writing extension recommendations
- manual on simple statistical analysis of experiments
- methods on using soil & land suitability reports in agricultural research
- methods on involving farmer actively in on-farm & on-station research
- methods on appropriate data collection and analysis based on available district data
- methods on sampling techniques
- methods on how to design & implement simple case studies
- manual on how to perform crop margin analysis
- methods on how to set up and document on-farm & on-station demonstrations

6. COORDINATION

Except for some training, supervision and monitoring trips, financing for the on-farm trials managed by the districts and the yearly research workshop organized at BTK, not much interaction takes place between the target districts and the SCRP. It would be advisable to spend more time with the districts close by in Luang Prabang province, to exchange information regularly and to organize exchange visits to each other research plots and/or demonstration - model farmers to stay up-to-date with potential cropping/farming changes, new market developments etc.

The integration with the extension sub-programme could be improved by:

- organizing regular i.e. bimonthly meetings in Vientiane or Luang Prabang to discuss coordination issues
- by exchange of documentation material on research & extension and on the nature and location of demonstration sites
- jointly organizing workshops as is anticipated in the jointly planned research & extension workshop
- by advance notification of visits of the extension team to Luang Prabang.
- jointly choosing an appropriate site for model/method development activities

ANNEXES

Annex 1. Terms of Reference

Annex 2. Daily activity schedule Sept - Nov '97

DATE	ACTIVITIES PERFORMED	LOCATION
Sept 1	Meeting with SIDA Advisory Team on credit, reading analytical report, signing contract.	Vientiane
Sept 2	Administrative work, travel to Luang Prabang, assist Project Director in editing workshop programme	Vientiane Luang Prabang
Sept 3 -4	Participate in seminar organized by SCRP-LP on Land-use development in Luang Prabang province. Provide translation from Lao to English for Prov. Adv. Saravane. Informal introduction to key provincial government staff and local & international staff of other relevant projects at seminar.	Luang Prabang
Sept 5	Briefing by P. Hansen on project, provide comments on draft terminal report and research manual, read project documents	Luang Prabang
Sept 6	Visit Ban Thong Khang station and research trails & demo sites. Got briefing on	Ban Thong Khan

	exp. res. programme by project staff.	
Sept 7	Rest day	Hongsa
Sept 8	Attend the terminal report presentation of Peter Hansen and subsequent discussion at office. Continue reading documents	Luang Prabang
Sept 9	Continued briefing by Peter on project based on questions	Luang Prabang
Sept 10	Discussion of ToR and preparation of tentative work programme for Oct/Nov. Departure of Peter to Vientiane.	Luang Prabang
Sept 11	Finalize work programme based on discussions with Mr. Houm, make final arrangements for housing. Select project reports for studying. Travel back to Vientiane	Luang Prabang
Sept 12	Administrative duties. Swedforest office, briefing & discussion with Extension Adviser on extension programme. Informal introduction to Advisers and sub program directors.	Vientiane
Sept 13	Final meeting with Project Director. Completion activity report and work plan.	Vientiane
Sept 14	Rest day	Vientiane
Sept 15	Briefing with Carl Mossberg. End of first part of assignment	Vientiane
Oct 13	Start second part assignment. Travel VTE - LP; Intro to staff. Reading preliminary Lao report on field trials 1992-95.	Luang Prabang
Oct 14	Travel to BTK station; Obtain briefing on 1997 research activities on-farm and on-station with exp. research staff.	Luang Prabang
Oct 15	Whole day visit to all on-station and some on-farm trails.	Ban Thong Khan
Oct 16	Continue visiting some on-farm trails. Briefing by descriptive research team on present activities.	Ban Thong Khan
Oct 17	Rest day. End buddhist lent. Visit boat races in Nane district.	Ban Thong Khan
Oct 18	Provide briefing on findings and preliminary recommendations for experimental research to all staff.	Ban Thong Khan
Oct 19	Rest day.	Luang Prabang
Oct 20	Training on statistical trail data analysis to selected staff. Provide some computer typed examples.	Luang Prabang
Oct 21	Training on statistical trail data analysis. Travel to VTE	Luang Prabang, VTE
Oct 22-23	Attend special adviser meeting on role advisers and project coordination	Vientiane
Oct 24	Attend discussions with DoF on outcome adviser meeting.	Vientiane
Oct 25	Administrative duties	Vientiane
Oct 26	Rest day	Vientiane
Oct 27-29	Travel to Luang Prabang. Continue on-the job training on statistical trial data analysis for selected staff	Luang Prabang
Oct 30	Travel to BTK; Visit demonstration sites and study potential dry season on-station research sites	Ban Thong Khan
Oct 31	Visit to Nane district, meet DAFO and 3 farmers who practise multiple cropping. Discuss potential dry season onfarm sites. Meeting with descriptive research team & provide some advise on extra data collection in the Nane watershed	Ban Thong Khan
Nov 1	Meeting with staff of the demonstration unit. Advise on documenting demonstration experiences.	Ban Thong Khan
Nov 2	Rest day	Luang Prabang
Nov 3-4	Experimental data analysis with Vilapong, Saysanna & Prasit; Meeting with Institutional Strenghtening Adviser on model development.	Luang Prabang
Nov 5	Assist Sompachan with translating 1996-7 project summary report from Lao - English	Luang Prabang

Nov 6	Continue exp. data analysis with Vilapong; Advise on dry season trail site selection based on soil reports. Complete climatic table and graph for descriptive research team.	Luang Prabang
Nov 7	Report writing; continue data analysis. Travel to VTE	Luang Prabang, VTE
Nov 8	Office & statistical supply purchase, notebook computer repair	Vientiane
Nov 9	Rest day, Travel Vientiane - Luang Prabang	Vientiane, LP
Nov 10 - 12	Attendance workshop on preparation of Lao - ADB shifting cultivation development project, Xieng Ngeun district	Xieng Ngeun
Nov 13	Meeting with consultant ADB project, assistance with data collection on firewood use & sale for presentation by project director at FAO firewood conference in VTE	Luang Prabang
Nov 14	Field visit to BTK with ADB consultant	Ban Thong Khan
Nov 15	Continuation data collection firewood sale	Xieng Ngeun
Nov 16	Rest day	Luang Prabang
Nov 17-22	Assist descriptive research team in data analysis and reporting, assist project director in writing firewood paper and in editing two drafts incl. final presentation. Preliminary discussions on input short-term socio-ec. consultant	Luang Prabang
Nov 23	Rest day	Luang Prabang
Nov 24 -27	Start report writing consultancy report, write revised job description for long-term advisers	Luang Prabang
Nov 27	Travel to Vientiane	Vientiane
Nov 28	Advisers meeting, discussions on revised ToR advisers	Vientiane
Nov 29	Discussion of contract	Vientiane
Nov 30	Rest day	Vientiane

Annex 3. On-farm and on-station trials around BTK, 1992-7

DESCRIPTION EXPERIMENT	On-station						On-farm BTK		Total
	'92	'93	'94	'95	'96	'97	'96	'97	
1. Annual crops									58
1.1 Upland rice									13
• variety trial I (12 var.)		x	x	x	x	x			5
• variety trial II (6 var.)					x	x		x	3
• variety trial III (7 new var. from IRRI)					x	x	x		3
• fertiliser trial					x		x		2
1.2 Corn									15
• variety trial			x	x	x	x	x	x	6
• variety x plant date (x soil type) trial		x	x			x			3
• variety x soil type trial		x							1
• spacing trial		x		x	x	x			4
• spacing x seed rate trial		x							1

1.3 Legumes									17
• pulse species trial (3 - 4 species)			x	x	x	x			4
• pulses - planting date trial		x							1
• soybean variety trial			x	x	x	x	x		5
• soybean variety x soil type trial		x							1
• groundnut variety trial					x	x			2
• biomass production legume hedgerows	x								1
• pigeon pea variety trial	x	x							2
• pigeon pea planting date trial		x							1
1.4 Other field crops									8
• cotton variety trial					x	x	x		3
• sesame variety trial						x			1
• cash crop trial (sesame, cotton, mungbean, rice)					x	x	x		3
• wheat variety observation nursery		x							1
1.5 Pasture legumes & grasses									5
• species & spacing trial	x					x			2
• observation nursery (22 sp.)	x								1
• observation nursery (9 sp.)	x								1
• species - date of harvest trial		x							1
2. Cropping systems									14
2.1 Rice - rotation									
• Rice - pulse rotation					x	x	x		3
• Rice after pasture legumes					x				1
• Rice after grass fallow					x				1
• Rice after improved fallow					x				1
• Rice - p. pea intercrop - spacing trial		x							1
• Rice after improved fallow x burn/no burn			x						1
2.2 Cotton relay cropping					x		x		2
2.3 Cassava inter cropping (4 sp.)		x							1
2.4 Corn - soybean intercrop - spacing trial		x							1
2.5 Corn - pigeon pea intercrop - spacing trial		x							1
2.6 Burn/mulch on rice, p. pea, soybean, corn			x						1
3. Tree crops									8
3.1 Fruit trees									
• species observation trial (4 species)						x			1
3.2 Trees for wood production & reforestation									
• species observation trial (3 sp ; 5 var)						x			1

Cash crop trial	X		X								2
Cotton variety trial	X			X	X		X			X	5
Sugarcane			X								1
Pasture sp. trial	X										1
Mulberry paper spacing							X				1
Cardemon sp. trial										X	1
Industr. wood sp.	X										1
Mahogany sp.	X										1
Fast growing tree sp.	X										1
Teak + rice interpl.	X										1
Fruit tree sp.	X	X		X							3
TOTAL	15	3	6	6	3	3	4	2	4	5	51

¹As percentage of the total land area of the Nam Nane watershed Inception report, 03/98: Brief review of the Shifting Cultivation Research sub-Programme