Current Land Use in Vietnam

LUWG IIED

CURRENT LAND USE IN VIETNAM

PROCEEDINGS OF THE SECOND LAND USE SEMINAR
BAC THAI
VIETNAM

22-23 September 1994

Edited for the Land Use Working Group by

Caroline Howard

Land Use Working Group, Hanoi

and

International Institute for Environment and Development, London

CURRENT LAND USE IN VIETNAM

PROCEEDINGS OF THE SECOND LAND USE SEMINAR
BAC THAI
VIETNAM

22-23 September1994

Edited for the Land Use Working Group by
Caroline Howard

Published by: The International Institute for Environment and Development, London

Date of publication: 1995

ISBN no: 0 905347 84 6

Cover photograph: Bill Howard

Editorial assistance: Elaine Morrison, Hoang Hong Hanh

The Land Use Working Group gratefully acknowledges financial support from GTZ.

Copies of these proceedings are available from IIED and from the Land Use Working Group.

The Land Use Working Group
c/o The Ministry of Forestry
123 Lo Duc Street
Hanoi
Vietnam
Fax. +84 42 12661
e-mail: hanh@landuse-fm.gov.vn

The International Institute for Environment and Development
3 Endsleigh Street
London WC1H ODD
UK
Tel. +44 (0)171 388 2117
Fax. +44 (0)171 388 2826
e-mail: iiedforestry@gn.apc.org

TABLE OF CONTENTS

INTRODUCTION

In 1989, The Forestry and Land Use Programme at IIED was contacted by Reidar Persson of SIDA. He asked if IIED would prepare an independent view of why forestry and land use research in the developing world was less effective than it might be. I organised a workshop (the Oundle workshop) bringing together scientists working in Britain with those with an interest in the developing world and in farmer-oriented research. The scientists included: Professor John Jeffers (then head of the Institute of Terrestrial Ecology, formerly with the Forestry Commission), Dr Gill Shepherd (Rural Development Forestry Network, Overseas Development Institute), John Palmer (Oxford Forestry Institute), Jeff Sayer (now head of the Centre for International Forestry Research, CIFOR), and myself. It was an interesting three days during which we battled over whether, in order to involve farmers and to make research locally relevant and affordable, scientific standards (project design, replication etc.) should be allowed to slip in the developing world. This argument broke along entirely predictable lines, with those scientists working in Britain opting for no loss in standards, whilst those who worked in the developing world felt economy and local relevance (involving the farmer) were important, and that wider issues of scientific quality were less important than these.

However, it was eventually agreed that less than good science is no more acceptable or effective in the developing world, than in the financially more secure world. Financial corners should not be cut in research. Where there are insufficient funds, priorities should be set with extreme care. Two major recommendations emerged from the Oundle workshop:

1. That where scientists could be identified doing good and effective work, they should be provided with adequate support, and left to set their own programmes and priorities. It was considered that in science the most valuable asset is the talented individual. International and other funding agencies should seek to support scientists already achieving good results, aiming to develop teams of excellence around outstanding individuals.

2. That in general neither scientists nor politicians should set the research agenda, but that priorities should be set by scientists and politicians working together.

Vietnam

In 1991 the Tropical Forest Action Programme for Vietnam was completed. Although there were a large number of recommendations for research in relevant sections of the Programme, there was a need for these recommendations to be prioritised, and for a programme for research over the next few years to be prepared. Financial support from SIDA was still available to IIED, and, with encouragement from the TFAP National Coordinator, it was decided to use this support to hold the First National Land Use Seminar in Vietnam, inviting politicians, scientists and land users to discuss where research priorities should lie. Unfortunately we did not agree a list of research priorities or achieve the tidy solution (research programme) we had hoped for. We did, however, identify some critical research topics, and of greater importance, we formed the Land Use

Working Group, a consortium of scientists and politicians, who meet on a regular basis to discuss policy and research and to take forward the work begun at the seminar. The Group is able to provide high level advice to Government on request. In 1993, the Group became more effective, when funds were attracted for its support from the Government of Germany.

Professor Hoang Hoe, Chairman of the Group, says more about the functioning of the Group in his opening address. In this Second Seminar, we intend to review the current land use situation in Vietnam and to provide an up to date record. The papers are comprehensive and range from a history of land use policy in Vietnam (Dr Ton Gia Huyen), to an overview of current policies, laws and land uses (Dr Tran Khai). Whilst the majority of papers have been written by senior scientists or politicians, there are papers prepared by farmers which record their life stories or their responses to changing policies and regimes. The proceedings close with suggestions for future directions for the Group. I believe that anyone reading these proceedings will gain a clearer understanding of modern Vietnam, and its problems and achievements.

In editing these proceedings I have, wherever possible, left the language in the form that I received it, having only modified the text to remove ambiguity. I believe that this approach retains the ideas of the contributors more closely, but in doing this, I regret I have left the English reader to persevere with some unfamiliar usage.

Caroline Howard
Editor

1 WELCOME ADDRESS

by Professor Hoang Hoe, Chairman of the Land Use Working Group

Three years have passed since the first Seminar on Land Use and Research held in Hoa Binh in September 1991.

As a result of that seminar, the Land Use Working Group (LWG) was formed, involving various sectors. This group consists of 15 senior scientists and politicians interested in research on land use. During the last year, various research projects have been started in accordance with research recommendations developed at the first seminar. These include projects on policy renovation, methodology for integrated land use planning, participatory methods for allocation of forest and forest land, assessment of land use environment following land allocation to farmers, household economy affected by land use pattern. Preliminary results will be presented and introduced at this seminar.

During the past three years in Vietnam a number of new policies and laws have been introduced:

* Land Law in 1993

* Decree 02/CP on Use of Forest Land (promulgated on 15/1/1994)

* Decision 202/TTG concerning contractual policy applied to individual household for protection, maintenance and plantation (promulgated on 2/5/1994)

* Decision 264/HDBT on incentive policy for forest investment and development (promulgated on 22/7/1992)

* Investment procedure for protection, maintenance and plantation (promulgated be the State Planning Committee on 15/3/1994).

The introduction of these laws and policies has speeded up the implementation process of Forest Protection and Open Land and Barren Hill Regreening Programme as of the Decision 327/CP promulgated by the Government in late 1992. This is a national programme with two main objectives:

- To protect the existing forests and regreen barren hills and mountainous areas.
- To promote fixed cultivation and the sedentarisation programme combined with household economy development in hilly and mountainous areas.

Over two years of implementation of Decision 327/CP, local people have become actively involved and many remarkable and encouraging results have been achieved. However, problems still arise and need to be studied and solved.

Land allocation and forest contractual allocation work in accordance with the Land Law and the Decree 02/CP have been implemented in many areas. Useful experiences have

been drawn from some areas such as Tu Ne (Hoa Binh), Tien Yen (Quang Ninh), Bac Thai, Tuyen Quang and some others. The Ministry of Forestry is planning to complete land allocation and forest contractual work in two years (1994-1995). However, the methodology for land allocation and forest protection needs to be simplified, and to be less expensive and more efficient. Giving confidence to the people remains a problem which needs to be further studied.

Agriculture extension, forestry extension, upland farming systems, tree planting and animal husbandry activities are being developed thanks to active participation of the people and communities in many hilly and mountainous areas. There are, however, few successful pilot demonstration models and few experienced and qualified extension workers for specific local conditions.

Investment capital including grants and loans provided by the Programme 327 have been handed over to family households, providing support chiefly to poor families after receiving land and forests. In this regard, however, further study is needed to make the best use of the limited resources.

A number of cooperation programmes with foreign countries including Sweden, Germany, Japan, and international agencies: WFP Care International, OXFAM, CIDSE... are contributing to Programme 327.

The Land Use Working Group (LUWG) in cooperation with the International Institute for Environment and Development (IIED) and with financial assistance from the German technical assistance agency, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), have organized this second seminar with the following objectives in mind:

- To introduce and present some results of research on land use over the last three years by scientists.

- To discuss constraints and problems that have arisen and to set out recommendations for application of research results.

- To discuss the future land use research programme and potential for cooperation.

This Seminar is guided by the Ministry of Forestry and supported by the People's Committee and Forestry Department of Bac Thai province.

We, on behalf of the Land Use Working Group Seminar organizing committee, warmly welcome all delegates, international guests, scientists, managers, and correspondents... attending this seminar, bringing with them their valuable experiences and opinions which will doubtless contribute to the success of the seminar.

We wish a success to the seminar and good health to all delegates.

2 THE PRESENT LAND USE SITUATION AND THE STRATEGY FOR LAND USE FROM NOW TO THE YEAR 2000

by Dr Tran Khai, Deputy Chairman of the State Planning Committee

Vietnam has a natural area of more than 33 million ha with various land types. From the economic point of view, land resources are divided into agricultural lands, forest lands, lands for special use, and unused lands. For assessing the economic value of land use, the following criteria should be taken into consideration:

* The transformation of land use categories in terms of surface areas;
* Product output, value of product and benefit gained per land unit;
* Land and environment protection, especially soil fertility.

1 On Land Use Areas

In 1993 the land areas used for agriculture, forestry and fishery present 16.989 million ha accounting for 51.32% of the total area. This figure is the highest level that has ever been achieved.

Agricultural land constitutes 7.348 million ha being increased by 5.8% (or 406 000 ha) and 5.0% (or 355 000 ha) compared with that in 1990 and 1980, respectively.

- The area under annual crops is 5.523 million ha showing a stable tendency compared with the preceding time (the figures for 1985 and 1990 were 5.615 million ha and 5.338 million ha, respectively).

Land used for rice is 4.253 million ha, which represents a decrease of 40 000 ha compared with that in 1980, but an increase of 140 000 ha compared with that in 1990.

- A significant increase was observed in the perennial crop area which reached 1.247 million ha in 1993 accounting for an increase of 19.3% (or 202 000 ha) and 55% (or 445 000 ha) in comparison with 1985 and 1990, respectively.

- The water surface used for agricultural production is 273 000 ha, i.e.increase 59.8% (100 000 ha) compared with 1985.

Forested land area is 9.641 million ha being similar to that of 1985 but increased by 350,000 ha over that of 1990.

- The natural forest area presents 8.841 million ha being decreased by 250 000 ha compared with 1985.

- The planted forest amounts 799 000 ha presenting an increase of 190 000 ha compared with 1985.

Unused land area constitutes 14.2 million ha, which means a reduction of about 5%

(600,000-700,000 ha) compared with 1985 and 1990. A Major part of the unused area is of bare land and denuded hills and mountains (11.42 million ha) of which there are 10.4 million ha with potential for agricultural and forestry production (in 1993).

The total sown area in 1993 was 9.714 million ha being increased by 7.4% (or 674 000 ha) and 13.4 % (or 1.158 million ha) in comparison with 1990 and 1985.

The land use coefficient has consistently increased with time : 1985 : 1.38; 1990 : 1.46; 1992 : 1.55; 1993 : 1.57 folds.

The forest cover has somewhat increased : 1985 : 29.14%; 1990 : 28.38% and 1993 : 29.18%.

2 On land use effectiveness and land and environment protection

There has been an increase of product amount and value per land unit. In comparison with 1985 and 1990, the value of product per ha of agricultural land increased by 26.5% and 13.9%, respectively (1985 : 1.917 million dongs; 1990 : 2.129 million and 1992 : 2.426 dongs per ha)

Yields of crops, particularly rice, increased. In 1993, rice yield increased 23.3% and 7.5% compared with 1985 and 1990, respectively (1985 : 2.78 tons ha-1; 1990 : 3.19 tons ha-1 and 1993 : 3.43 tons ha-1).

The value of exported product per ha of agricultural land increased. In 1992, the value got an increase of 23.9% and 9.8% over 1985 and 1990, respectively (1985 : 39.5% USD ha-1; 1990 : 112.0 USD and 1992 : 123.0 USD ha-1). Per capita food has also increased: 1985: 304 kg; 1990: 324 kg and 1993: 346 kg per person.

A number of measures were undertaken to maintain and improve soil fertility. These include, terracing of sloping lands, application of organic manures and mineral fertilizers, constructing irrigation and water drainage works, reducing soil acidity, salt washing, and integrated pest management.

In the last few years, with Government support, reforestation has been taken forward, particularly on the bare land and denuded hilly areas. Measures have been applied to gradually reduce the areas cultivated with slash-and-burn techniques.

Generally, in the last years land use in Vietnam has made significant progress, providing an important contribution to the improvement of the people's living standards and the stabilization and development of the country's economy.

However, it should be noted that the long-lasting war has left a serious consequence on our land resources, water resources and the environment in general, especially those of the increasing population pressure and the great demands in food and foodstuff, raw materials and land based production for export are also aggravating the problems.

Therefore, there is still a lot of work to be done to overcome these constraints.

The proportion of land used for agriculture and forestry is still low. The area and quality of the natural forests show a declining tendency. In many locations forests are being destroyed by slash-and-burn cultivation. The unused land proportion, although somewhat reduced in recent years, is still large : 1985 : 44.8%; 1990 : 45%; 1993 : 43.95%. The bare lands are still wide. Inventory carried out during the period from July 1990 to December 1991 showed that these lands cover an area of 11.42 million ha of which 10.4 million ha have some potential for agriculture and forestry production.

In 1993 the natural forest area was 8.841 million ha, which had decreased by 200 000 ha from 1985. On average, a decrease of 40 000 ha of forest has occurred annually. In many Provinces the coverage remains very low: For example:

- in Laichau (7.88%),
- in Sonla (11.95%)
- in Laocai (5.38%)

resulting in serious erosion, leaching and disastrous flooding which becomes increasingly frequent.

The total production and its value per land unit is still low. Crop yields are not yet high enough although there is still potential to enhance yields further.

3 Land use strategy from now to the year 2000

Appropriate and effective use of land will profit the national economy. In Vietnam, agriculture provides 36.6% of the national GDP. Appropriate land use can promote high crop yields, high product quality and high value of products per land unit.

The demographic forecast indicates that towards the year 2000 our population will reach 81 million people of which 75% will live in the rural sector.

The strategy for land use from now to the year 2000 requires an effort:

* To produce large amounts of outputs for enhancing the people's living standards with increasing demands on large quantities and diversity, with quality high enough for reserve and increasing export.

* To improve, on the above basis, the people's income and living standards targeting a stable and developed economy.

* Towards maintenance and increase of soil fertility and protection of the environment and building up a developed and sustainable agriculture.

Targets of land use to increase efficiency are based (a) on product value, especially profit per land unit and (b) to widen the areas to be used for agriculture and forestry.

Concerning the land area, agricultural and forestry lands should be increased in the following ways:

* Exploit the bare land and denuded hills which is still highly potential (10.4 million

ha). There exists some opinions estimating that out of this total area, about 5 million ha can be used for forest planting, 3 million ha for industrial and fruit crops and 2 million ha for pasture.

These lands are concentrated mainly in the hilly and mountainous region of the North, the Central Coastal region, the eastern part of the South and the Central High Plateau. For exploiting these lands, a national program has been initiated-Program No.327 Protection of Forest and Regreening Bare land'. It will be continued and developed enlarging the extent of land area to be exploited. Each of the relevant projects will be perfected in terms of their organization and management.

* Exploit the coastal silted areas for raising aquatic cultivars and planting mangrove forests. This area amounts 80 000 ha which are located mainly in some coastal provinces of the Red river and Mekong river deltas.

* Protect and maintain the existing forest areas.

* Increase the forest areas by restoring and replanting 5 million ha of forest so that towards the year 2000 there will have about 14 million ha of forest increasing the coverage degree to 40-42% of the total area.

* Continue to increase the sown area of agricultural crops through the application of the advanced bio-technologies, irrigation and drainage, land amelioration aiming at enhancing the land use coefficient. These will help to convert the areas presently grown with one crop-season into two crop-seasons and the areas with present two crop-seasons into three or even four crop-seasons per year for the plants of short growth duration such as rice, vegetables, leguminous and other plants.

* Regarding land use efficiency, the total product value and the net return per land unit in particular, are considered the main indicators to access the direct effect of land use systems in which crops and animals are diversified and land is intimately attached to crops, animals and market.

Previously, due to the self-sufficiency imposed, certain areas in the coastal and/or depressed places have been forcibly grown with rice, which gave a very low yield. Nowadays, these areas can be converted to raising aquatic cultivars of rice of higher market value. Some areas of paddy still lacking adequate water can be used for growing fruit crops, vegetables and so on.

Industrial plants like rubber, coffee, tea, fruit crops and plants of special value are intensively developed in locations with favourable conditions. Product quality should be upgraded to meet the in country demand and export standards.

Market mechanisms have brought and will bring into play the intelligence and initiative of the farmers in making the land use maximally profitable.

To achieve the above-mentioned requirements and objectives, it is imperative to implement the following policies:

1. Continue the land and forest allocation so that all land and forest plots have owners, particularly for the forestry lands. As at October 1, 1992 the area of forest and forest lands allocated was only 4.6832 million ha of which 1.77 million ha was forested land and 2.9129 million ha was not forested (estimates for the non-state sector only).

   In the state sector of agriculture and forestry, various kinds of contracts have been applied depending on land and forest categories. The users' rights fixed in the land law should be put into full effect so that farmers be sure in their investment and the land accumulation be facilitated in concordance with the laws.

2. Continue the movement of fixed settlement and cultivation to improve the living standard of the ethnic groups of population. This work should be closely attached to the forest maintenance and protection, to the creation of sufficient income for people to live on the forest and to halt the destruction of forests for slash-and-burn cultivation. This is a most important option to protect and restore the forest cover.

3. Classifying forests for investment and management

   * Regarding the protective forests, the forestry area constitutes 5.740 million ha of which 2.7985 million ha are forested and the remaining (more than 50%) is unforested. Priority in maintaining and restoring forest is directed first to the areas already defined as protective forests.

   * For the special use forests (national parks conservation zones, historical vestige zones), inputs will be allocated to protect, upgrade and maintain the precious and rare fauna and flora. On the other hand, it is necessary to increase their richness, diversity and beauty in serving economy, tourism and environment. It is attempted to increase this forest from present 600 000 ha to 1 million ha in the year 2000.

   * The production forests should be reclassified for management exploitation. Where they have been exhaustively exploited causing a serious decline in their quality, it is imperative to cease exploitation and to close forests.

4. In exploiting lands, attention must be focused on two large regions, i.e the bare hills and mountains and the Mekong delta.

   * The bare hills and mountains are located mostly in the Middle zone, the mountainous zone of the North, the coastal provinces of the central part of Vietnam, the Central High Plateau and the eastern part of the South. In reclaiming and exploiting them, special attention should be considered for harmonizing social, economic and environmental interests.

     This work requires a combined knowledge of various disciplines: agriculture, forestry and the environment. It will also need a close integration of the knowledge of both scientists and economists to use these lands more effectively and diversely.

* The Mekong delta contributes up to 50% of the rice area and production of the country. It is also a region where water resources and solar radiation are abundant, alluvial soils of the Mekong river are fertile the aquatic species are diverse and there are a number of rare birds precious not only for Vietnam, but also for the world. Soils of the delta are saline and sulphate-acidic suffering much from the strong influence of the marine tides.

  The delta has more than 500 000 ha of unused lands accounting for about 12.6% of the total area. These areas should be reasonably exploited with an appropriate re-arrangement of the crop and domestic animal kinds and species. In the years to come, there will have 300 000 ha to be converted into rice cultivation. The former forest areas will be reconstituted and meantime, the aquatic cultivation areas will also be expanded.

4 Overcoming the capital constraints

In account for the early 1993, out of 4.683 million ha of allocated forestry land there were only 1.407 million ha have been put into use. The main reasons are the poverty of the farmers who are short of cash and not able to exploit the entitled land. For reaching 40-42% coverage in the year 2000, it needs about 1000 billion dongs. In many places, formers can to convert the areas under rice into cultivation of other crops or animals of higher value, but they are not able to do because of short input. Lack of capital is the major constraint that limits the re-arrangement of crop and animal production pattern and the improvement of value and profit per land unit.

Therefore, the state is trying to find various sources to loan farmers at reasonable rate and duration.

5 Production, sale and market issues

Sale of produce is very important. For this, on one hand it is necessary to improve the product quality and, on the other hand, to seek markets.

6 Subsidised price for agricultural products and materials

Our agriculture and forestry suffer much from natural calamities. In nation- and world-wide terms agricultural and forestry products can be short or surplus, causing an instability in their prices, which may vary in an extreme amplitude not in favour of farmers.

In many cases, the price of agricultural products is low but that of materials (fertilizers, insecticides etc.) remains high making the farmers' already low income drastically lower. In this regard, the Vietnamese State has introduced subsidised prices for farmers in different ways. For example, by reducing fees for transporting materials to upland districts and villages. Materials serving agricultural production can be imported without taxes. Materials are kept in reserve ready for emergency cases.

The Government is considering other measures to help farmers to benefit from subsidies. For example, surtaxes on imported goods of high value are raised, the sum gained being used to subsidise imported materials necessary for production.

The policies for subsidy aim to help farmers stabilize their crop fields and to gain an adequate income which in turn will help to increase their input capacity and effective use of their lands.

7 Building the infrastructure

Infrastructure, especially transport, has a great meaning in production development. A developed road system will enhance our transport capacity, and facilitate the capacity for product consumption. It will help to reduce product costs. In the uplands extreme care will need to be paid to the environmental consequences (deforestation, erosion) of developing a road system. In many locations, farmers have exploited large areas of bare lands and gained significant amounts of products for sale which require a better transport system to meet the increasing market demand.

For assisting farmers to apply scientific and technical advances, appropriate inputs should be devoted to the update of irrigation systems, research centres, plant and animal breeding stations, extension services, plant protection services, etc.

8 Application of scientific and technical advances

This is a very important condition for effective use of land. Attention should be paid to the selection of plant and animal varieties suitable for different soil types. Studies of utilization of fertilizers (organic manures, mineral fertilizers, microbiological inoculants and others) should be increased. Integrated plant protection should be more widely applied.

9 Irrigation and drainage for land amelioration

In the coming years, investment will be put into water management to improve irrigation and drainage systems for land amelioration. Nationwide, this requirement is enormous, so priority is to be stressed on the region suffering serious water deficiency such as the coastal provinces of Central Vietnam. Certain areas of the Red and Mekong deltas are being extended by land reclamation and an increased number of crops are being grown.

10 Some other issues

It is important to:

* Put forwards land use planification at national and at Provincial, district and village levels.
* Allocate more funds for cadastral organizations from central to local levels to facilitate and accelerate the process of issuing land use certificates (land allocation).

3 THE 1993 LAND LAW AND LAND POLICIES

by Dr Ton Gia Huyen, Director General of the General Department of Land Management.

The land regime of ancient Vietnam was marked through its historical development, since the Ho Dynasty (15th century) by the limited area of fields (han dien), the military colonist institutions, (dinh dien), the state farm (quan dien), the allocation of public fields to public and private fields (quan dien).

The first land tax register (tich dien) was established in 1092. From the Le Dynasty the Kings paid attention to establishing civil state registers of villagers to serve as a basis for State management : statutory labour, military service, taxes and duties, in 1428, the Le Dynasty ordered the drawing up of the land register, at the village level every four years.

In 1803, the Nguyen Dynasty, ordered the drawing up of a village land register in all Northern provinces of Vietnam (Bac Ha). Each land register included from fifty to one hundred sheets with indications about the administrative situation of the village, the acreage of the fields and lands, the categories of land, of each plot of land with the owner's name and the boundary of the village.

After the setting up of the French Colonial administration, the process of usurping Vietnamese peasantry's land expanded through different steps:

* the Colonial administration deprived Vietnam Royalty of the sovereign right of land ownership and management; through the pauperization policy, (especially, exorbitant taxes), relating to the peasantry... the peasant was obliged to sell his plot of land, mortgage the part of communal land to the French capitalist, leave his village and to go away to add to the supply of labour to the plantation, mines...

* The French then introduced their land registration, surveying and mapping system into Vietnam, the French system of land registration has many similarities to the Torrens system of issuing Certificates of Title. It provided a mechanism for registering transactions of land including transfer of ownership, mortgages.

* In the North after 1954, Land Reform continued, the State was empowered to reclaim land. All urban land owned by landlords and others, was taken back by the State and reallocated to landless citizens to enable them to earn their living.

* Under the second Constitution passed in 1959, three types of property were recognized : State, Collective and Individual property.

A policy to move away from private ownership to allocation to State enterprises and cooperative farming units was introduced in 1960, with low level cooperatives including 10-30 households and high level cooperatives with 200-400 households, the households being remunerated by the cooperatives.

With the ending of the war and reunification of the Country, the Third Constitution of 1980 institutionalized the establishment of a national economy based on two economic sectors: the State sector under the ownership of the entire people and the Collective ownership of the working people. The Constitution abolished private and collective ownership of land and vested all land in the State, but left the ownership of building vested in the individuals.

"Doi moi" and the new land policy

In 1986, the 6th National Meeting of the CPV adopted the Renovation policy of "Doi moi", leading to the switch from a centralized command economy to a market oriented multi-sectoral economy. It confirmed the great orientation set for economic renovation in the direction of building a new and modern economy, in which all economic sectors are equally encouraged to develop their undertakings and act according to the market principle of supply and demand. The role of regulating economic activities through macro economic policies and instruments, and carrying out an open door policy in relations with foreign countries. Such orientations have achieved obvious good results in various domains of activity.

In the field of Agriculture, a production-based contractual quota system to every household has been applied to replace direct centralized management of all economic activities in rural areas by cooperatives. The purchase and sale of farm production materials and products has been allowed to freely operate on the market. Such a policy has stimulated peasant households to invest their labour and funds, so as to exceed the quotas they were obliged to deliver to the cooperatives and to enjoy any excess products themselves.

Resolution 10 of the Politburo on the agricultural economy, provided for the abolition of the budget subsidy system in the rural sector and the institution of a market orientation; the peasant household was considered as a self-governing basic economic unit, to which is entrusted a portion of land for long-term use and the right to decide on his own business, is a step forward in the switch over to the privatization of agriculture. (The Collective peasants Association has been changed its name to " Peasants Association"). It has brought about a series of great socio-economic changes in rural areas : land use, social division of labour, production organization etc,... These changes also create new requirements in terms of policies, such as land policies, social policies, rural credit loan regulation, land registration, issue of Land Tenure Certificate.

The 1988 Land Law

Based on the 1980 Constitution, the first Land Law of the Socialist Republic of Vietnam was the first legislative document to be passed after the 6th Party Congress. It took nearly seven years and over Seventy draft versions, before the Land Law was passed by the National Assembly in December 1987 (with a revision of the draft Land Law to introduce market economy issues where possible). It was promulgated by the President on January 8, 1988.

In general terms, the Land Law has put in order the administration of land performed by

the State, and with other policies along the Renovation process, it has encouraged production through the liberation of the productive force and has gradually settled the use of land for economic development.

Nevertheless only a few years after it was passed, the Land Law was already out of date, being overtaken by the speeding up of the renovation process. The Law was ambiguous and vague, with broad statements of principle leaving "tough issues" to be resolved by subsidiary regulation. Subsequent administrative degrees intended to supplement and clarify the Land Law were issued belatedly or not at all, and as a result, the potential for inconsistent or conflicting provisions was not reduced.

The reliability of the Land Law

Altogether it could be said that the policy of allowing a market economy was only partially implemented by the 1988 Land Law, which was itself juridical bound within the frame work of the 1980 Constitution.

The Fourth Constitution - 1992, and the new Land Law - 1993

Under the Rule of Law, the Fourth Constitution of Vietnam was adopted in 1992 with a view to institutionalize the new Party and State official policies. As the result of the 1992 Constitution a new Land Law was passed in July 1993 to implement and specify the constitutional provisions on Land Law and policies.

Major changes brought on by the 1993 Land Law are :

* Creation of an urban and rural residential category of land

* State guarantee to the land user of his rights in respect of land allocated to him and his legal interests in that land (a "land use right").

* Right for an individual who is allocated land by the state to exchange transfer, lease, inherit, and mortgage the land use right subject to the Land Law and its regulations.

* Land valuation for taxation of land use and land transference of land use rights, assessment of property, values as the land is allocated, and compensation for land damages.

* Land is allocated for stable and long-term use.

* 20 years for annual crops and aqua culture;
  50 years for perennial crops;
  as determined by Government in respect of all other types of land

* The Law-makers focused on the importance of land to people of Vietnam, in the Preamble.

* "Land is an extremely valuable national resource, and special production is the most important part of the environment, and the foundation on which residential areas are distributed, on which economic, cultural, social, security and national defence bases are constructed".

* "Over many generations, our people have devoted an enormous effort, labour and sacrificed our lives to establish and protect the land as it now is".

* "This Law stipulates the Land administration land use system, the rights and obligations of the land users".

* The Law is in the Chapter I of The General Provisions that include the fundamental principles.

* "The State shall allocate land to economic organizations, units of people armed forces, State institutions, political, social organizations (here-in-after collectively, referred to as" organizations"), households and individuals for stable and long term use. the State may also lease land. Organizations, households and individuals receiving land allocated or leased by the State are here-in-after collectively referred to as "land users" in this Law".

* Referring to foreigners, Art 1, item 3 expressly mentioned : "The State shall lease land to foreign organizations and foreign individuals".

* To encourage and facilitate foreign investments in Vietnam, The second Land Law - 1993 has been more specific in Chapter V on the "Regulations on Foreign Organizations, Foreign Individuals and International Organizations leasing land in *Vietnam*", *than the first Land Law - 1988.*

Land acquisition (land allocation)

Land acquisition (including land lease and land resumption) is an important issue amongst the activities of State management of land stipulated in the Land Law (Article 13). Basis for decision on land allocation are :

1 Land use planning and land use plans approved by an authorized State body.

2 Land use requirements included in the technical and economic justification and in the design approved by an authorized State body, or included in the application for land allocation (Article 19 - Land Law).

The power of lower level (district) is enlarged in respect of land allocation for agricultural and forest production. A part from the available 7 million ha the bare land and hills presently need to be explored in Vietnam for agricultural and forest development. The land users who are using land for agricultural and forest production will not have to pay for land use (Article 22 - Land Law), the people who are using bare land and hills for the agricultural and forest production will be supported by a program loan for initial development from the State (Decision No 327).

There are more than 10 million hectares of bare land and hills, which stretch all over the country, and concentrate in the Northern mountainous area (4 million ha), the central Plateau - Tay Nguyen (2 million ha) and the East, of the Southern area (2 million ha), in these areas the infrastructure is weak, transportation is undeveloped, the soil is dry and eroded or acid sulphate. These areas are less populated.

More than 6 million hectares of agricultural land have been allocated to more than 10 million peasant households, due to the equality in land allocation and the principle that the peasants who earn their living by agricultural production are given land, land is very finely subdivided (every family must have parcels of the good quality land, near and not near their houses), so that labour productivity and the effectiveness of land use are not limited.

The new rural construction strategy aims to renew the irrigation-systems and assist with industrialization, and the redistribution of rural labour - the people who are already skilled will work in their own professions, the land will remain with families, who have experience in agricultural production, forest tending and protection, every household can use up to 3 ha land for production of annual crops and up to 30 ha land or perennial crops. It is also the intention to develop the local processing industry and new economic regions in order to encourage rural labourers to leave the land and to dismiss from the land families who are using land ineffectively.

The regulations of land allocation for the purpose of industry, commerce, urban house building are closely stipulated, it is mainly focused at the Government and Provincial level. At present, there are approximately 1,200,000 ha of land in urban areas for industrial and commercial development, and the rural residential area, tentatively it will be approximately 1,600.000 to 1,800,000 ha by the end of this century, i.e., the development speed is about 100,000 ha per year, in which the agricultural land has been greatly encroached. The Vietnamese Government has intention by closely control all the changes of this land category in order to ensure the developing balance between the industry and agriculture, and rationally regulate the labour redistribution in the rural areas and ensure the land reservation for urban development. There is an irrational developing tendency which is not closely controlled by the State. Since the opening of the market economy has been developed, the house building without any planning in the vicinity of the main roads create the difficulties for the urban and rural residential development and the reduction of the agricultural land resource without prediction of the consequences. So a great requirement to the Government is to carry out the land use planning at all administrative levels (national, provincial, district and communal) to be the base for the land allocation, correction of the process of the development and settlement of all Land Law violation.

Zoning and land use planning

Seven geographical, and economic regions of Vietnam are recognised from the North to the South as follows :

- The North mountainous and hilly area
- The area of Red River delta

- Northern area of the previous Region No. 4
- The coastal central area
- The central plateau area - Tay Nguyen
- The South East area
- The Mekong delta area

Each area is distinct and has its own socio-economic characteristics, the requirements of land use planning are different.

The Northern mountainous and hilly area is very large, with a low population, and poorly developed transport system; there is much unused land. There are good mineral resources and potential for hydro-power. The development orientation is mineral exploitation, forest plantation, long-term industrial crops (tea, coffee) and cattle-breeding.

The Red River delta has the highest population density of the whole country, It has been cultivated for paddy for a very long time and is also the major industrial centre of the North. The land in this area is strictly controlled due to its high economic value. With new industrial, and commercial development, the cost of land is very high.

The area previously known as Northern Region No 4, has been badly affected by war, the land is largely derelict, and there is much flooding. But the area is rich in mineral resources and there is a potential for tourism along the coast.

The Central Coastal Area is tropical. Various plantation species grow well and there are few natural disasters. It is important for the development of intensive agricultural production; and it is famous amongst tourists for its long beaches and fine landscapes.

Tay Nguyen is a high plateau with rich basalt soil. It is famous for its plantations of tea, coffee, rubber and pine. There is still some primary forest and also approximately 2 million ha of bare land and hills owing to the war and transport. The Tay Nguyen Plateau is thought to be a suitable area for rapid and comprehensive socio-economic development.

The South East areas include Ho Chi Minh city, which is the area of fastest development in Vietnam in recent years especially since 1990. With respect to Agriculture, this area is famous for its plantations of fruit, coffee and rubber, in respect to industry, this area is a centre of major factories and supervision of the industrial development in the South of Vietnam. A new development triangle is under establishment : Ho Chi Minh city (centre of commercial services) - Bien Hoa (Industrial area) - Vung Tau (harbour of gas and oil industry and tourism).

The Mekong River Delta consist of 11 provinces is the major granary (rice) of the whole country, there is favourable natural condition for the paddy (wet rice) production and tropical fruit plantation - in this area there is approximately 1 million ha of unused plain land due to flooding or to the soil being acid sulphate. Because of many canals, road transport development is faced with difficulties.

Each area is individual and requires land use planning at the District and Communal

level. The general requirement of Communal land use planning is to define the existing situation of every land parcel and control its changes in the period of the coming 5 or 10 years. The main economic regions especially in the development triangles where the land use planning is under way.

If the new industrial development areas are established on the bare land and hills, planning is not too difficult; if it is based on agricultural and forest land, compensation has to be paid; it is preferable if industry is established in a residential area as there may already be a work force and it may not be necessary to relocate workers from rural areas.

The Policy of the State for the establishment of processing areas and industrial zones, is to provide the infrastructure and rent land parcels to investors to build factories.

Urban and rural residential development is in accordance with the land use planning and construction law. However it is thought that the State has not controlled this area sufficiently closely, especially, in cases where houses are built in the path of future roads.

The Vietnamese Law recognizes ownership of houses on the basis of their legal land use right. For house transactions, the citizen has to follow the procedures of the land use transference. The Government allows economic organizations to build the infrastructure for residential housing (roads, electrical and water supply and site clearance) and divide the land into parcels in order to sell them to the people for their residential houses.

Commercial areas are simultaneously established with the development of the residential areas, such as restaurants, hotels and markets, in addition, the Government builds houses for rent for residential or business use.

Rights and obligations of land users

The rights and obligations of the land user have been defined and written down, to emphasise their importance, and it is specified that:

The State shall protect the legal rights and interests of households and individuals, receiving land allocated by the State who shall be entitled to exchange, transfer, lease, inherit, mortgage the "land use right".

The above rights shall be implemented only during the term of land allocation and with correct purpose of the use of the land allocated, as stipulated in this Law and in other regulations.

The rights and obligations of domestic organizations to which the land is allocated and leased by the State shall be submitted by the Government to the Standing Committee of the National Assembly for decision.

The land user shall be responsible for the protection, improvement, fertilization, rational and effective use of land; for fulfilment of all cadastral procedures, payment of tax on transference of land use right and other payment in accordance with legal provisions.

The State encourages land users to invest labour, materials, capitals and to apply scientific and technical achievements to the following works.

- Increase the value of land use
- Intensive cultivation, multiplication of crops and increased efficiency
- Reclamation of waste land, fallow land and coast land, and greening of bare hill land and coastal sand dunes in order to expand areas of agricultural land, forestry land, aquaculture and salt production.
- Land protection, improvement and fertilization
- Economical use of land.

Art 74 provides for the household or individual using agricultural land, forestry land for afforestation, residential land, due to requirements of living and production shall be entitled to exchange the land use right and must use the land in accordance with the purpose and terms when it was first allocated.

Art 75 provides that the household or individual using agricultural land or forestry land for afforestation shall entitled to transfer the land use right in the following cases:

- Moving to other place
- Changing profession
- Incapable of working directly on the land

Households or individuals using residential land shall be entitled to transfer the land use right when moving to other place or no longer in need of the land. The transfer must approved by the authorized State body. The transferee must use the land for the right purpose.

Land use right to agricultural land for annual crops or to the land for aquaculture can be passed on death to members of a deceased's family living in the same household, if they are directly involved in agricultural production in that locality; for all the others, they may pass on land use rights to inheritors in accordance with inheritance legislation.

The land usage rights of foreign individuals organizations in Vietnam

The Vietnamese State can lease land to the foreign individuals and organizations for their use. The Government decides the land lease for every specific project.

The period of the land lease for construction of offices, offices of diplomatic representative is not more than 99 years. Period of the land lease for production, business is not more than 50 years; if excess time is required, the permit must be obtained from the Standing Committee of National Assembly but it is not more than 70 years.

Land lease is based on the economic and technical feasibility approved by the authorised State bodies in compliance with the Law on Foreign Investment in Vietnam and the related articles of the application records regarding the land lease of the foreign individuals and organisations in accordance with the Vietnamese legislation.

The State Committee for Co-operation and Investment (SCCI) has issued the detailed directives on the formulation of economic-technical feasibility and the Government has stipulation on the system of project appraisal which have the direct, investment from the foreign sides (Decision No 366/HDBT issued on November 7, 1991). From this there are 2 levels of the approval of investment projects :

- The Prime Minister
- The State Committee for Cooperation and Investment.

The Prime Minister assigns the functional institutions to study the process improvement of the economic-technical feasibility approval of the investment projects so that it can be implemented faster and avoid the trouble of the investors towards the orientation to strengthening the central leading and managing mechanism, standardise every procedure (merging the tables and models and stipulating the schedule to settle each problem).

Pursuant to the instructions of the State land Administration institutions, in the application records for land lease, apart from economic-technical feasibility, there still be following issues :

- Application for land lease according to the available form
- The plan of cadastral map of the land area which is applied for the lease and certified by Department of Land Administration.
- Option for the compensation of damages and the price of land lease certified by the Department of Finance-prices.
- Agreement of Province People's Committee and the ministries, branches relating to the land use.

Pursuant to the stipulation of the Land Law, the Standing Committee of National Assembly of Vietnam is about to approve the Ordinance on the rights and obligations of the Foreign individuals and organisations who are having the land lease in Vietnam with the orientation.

The foreigner who has land lease in Vietnam must comply with the Vietnamese Legislation and is protected by the Vietnamese State relating to the legal right if they violate the Law, they will be treated according to the Vietnamese Law, excluding the International Treaty which is signed or participated by the Socialist Republic of Vietnam that have different regulations. If the Vietnamese Government recovers the land before its termination due to the national benefit or national defense and security, the land lessee will be compensated the damages.

The land lessee will be given the Certificate to use the land leased and can use land in compliance with the purpose of land lease. The land lessee has a right to implement the construction with the design approved by the authorised state bodies in accordance with the land lease and is the owner of his building on the area of the leased land within the period of land lease.

Granting permission to foreigners to have rights of mortgage of the work build on the leased land, is under State review, attaching to the use of land lease as collateral in the Vietnam Bank; The real estate transaction is due to the reason to increase production. With respect of the joint venture enterprises that have land rent from the Vietnam or the Vietnamese that have the contribution by the value of land use rights, all have the right and obligations equivalent to the national economic organisations who have the land lease from the Vietnamese State.

Obtaining land clearance permits

When land has to be recovered by the State for reallocation to other users, the following regulations must be addressed:

1 The authorised State bodies allocate any land that have power to recover such land, the land resumption for other purpose must be complying with the land use planning approved by the authorised state bodies; Before recovering the notice must be given to the existing land user regarding the reason, the time and plan for the move and option of the damages compensation.

2 In order to obtain the decision of the land allocation the applicant of land lease need to have a records submitted to the Land Administration Department of Land Administration includes :

- Application for land allocation or land lease (attached form)
- The approved pre-feasibility
- Decision of the construction site
- The sketch (plan) cadastral map of the land area.

3 Having the decision of land allocation, land lease; the land user will continue the procedures of the land use contact and construction permit at the local authority and the land allocation is carried out in the field after the delivery of the land use payment, fees and accomplishment of all procedures to compensate the damages in accordance with the legal regulations.

4 On the completion of construction, the land user will register the new established property and the related land use right.

Land transaction (land transfer) and the role of land in the private economic development

The exchange, transfer, lease, inheritance and mortgage of the land use right are considered to be the different form and degrees in the relation of the land use transfer among the people who are allocated land for the use by the state.

The exchange of the land use right is a simplest form of the transaction of land use right is "material changed for material" creating the shortest way so that the land users can easily consolidate their land parcels, remedy the situation of small land subdivision remains due to the requirement of average distribution of land and insurance of equality.

The transference of land use right is a form of land transaction related to the market system, is the shortest way for the land can come to the people who can use land most effectively. In order to limit the consequence of the over land accumulation in some certain people, the State corrects this issue by taxation of the transfer of land use right and policy of limitation of land holdings.

The lease of land use right is limited only in the cases of the short capital, temporary short of labour with the purpose to save all land potential but no great change in the land user.

The inheritance of the land use right is still limited regarding the agricultural land for annual crops allocated to the household (only the people who are currently in the same family have this relation), but the land for perennial crops, construction is used the same with what is stipulated in the Civil Law.

The mortgage of land use right as collateral in the Bank of Vietnam is one solution to support the development fund to the peasants, but in fact, it still depends on the Bank potential and the real requirement of the people.

The Vietnamese Government do not have the intention of land privatisation, but facilitate the economic development of private sector which equals to the other sectors of national economy. The household is considered to be a self economic unit, allocated land for stable and long-term use and granted all the rights of land transaction.

The System of economic Management in State agricultural and forest farms also have a great change: land is given to every household and peasants in the area by the economic contracts, the management boards of agricultural, forest farms keep the services of production inputs and outputs (ploughing land, supply of seedlings, fertilisers, pesticides and agricultural products processing...) the State also issues permit to sell the garden crops, forest plantation - By this approach, the land use is directly attached to the benefits of every family so the land is well protected and carefully taken care of, the plantation productive is clearly increased, the living standard of the farmers is higher due to the increment of income.

To accelerate the vegetation covering the bare land and hills, the State Line regarding the land allocation for forest plantation in the period of State and long-term use up-to 30 ha per household. In addition, the natural forest was allocated to the households according to the labour of the household by the state forest farm for protection and tending.

Reorganisation of the State administration system on land

The General Department of Land Administration was formed in 1994 by merging the General Department of Land Management and the National Department of Geodesy and cartography. It has been given the responsibility of State management of land, and map Surveying for the whole country.

The responsibilities of General Department of Land Administration are :

1 Strategy formulation for land development planning and zoning and following up the implementation of the approved strategy.

2 Appraisal of the different branch and local land use planning, submission to the Government for the decision of land allocation, lease and resumption.

3 Issuance of the Standards, processes, instructions and norms of cadastral activities and revision of the implementation.

4 Survey, investigation, land evaluation and classification, cadastral mapping and issuance of Land Tenure Certificate.

5 Establishment and management of the Coordinate system, topographic serial photography, different map production, issuance of surveying and cartography licence.

6 Cadastral research of Science and technology and Development of international relation in the land administration sector.

7 Collection and archives of the land administration information and data.

8 Personnel and human resources organisation and development for the whole land administration sector.

9 Inspection on the implementation of land legislation and geodesy and cartography.

10 Management of cadastral issues.

4 COMPETING CLAIMS AND POLICIES FOR LAND USE, AND HOW TO RESOLVE THEM

by Dr Caroline Howard, Senior Fellow, International Institute for Environment and Development.

Thue tat ca cac bae Vietnam va cac bae quoe te ve du hoi thao. (welcome distinguished Vietnamese and international guests). You have asked me to talk about resolving conflicting claims and policies in land use. Conflicts are resolved by discussion and by working together. This was the purpose for which the Land Use Working Group was formed at the conclusion of our previous seminar in 1991. In this seminar we shall see the progress that has been made. Our statement of intent at the time of the first Seminar was:

> "To provide an influential, cross-sectoral interdisciplinary forum for discussion and review of land use policy and practice in Vietnam. The Group aims to ensure that policy makers have access to the essential research results and information needed to inform policy debate. The strategy is to improve the information flow from the land user to the policy makers. By:
>
> *1* *identifying information needs, and assembling existing information or by doing, or managing, the (principally) participatory research necessary to provide that information;*
> *2* *strengthening land user organisations and ability to provide information;*
> *3* *strengthening communication lines between land users and the State, especially at the Provincial level.*
> *4* *evolving and developing ways in which the land user and State may work together more effectively for their mutual benefit. This is likely to involve novel approaches towards developing a market economy including especial attention to the sharing of responsibilities, and provision of credit and other incentives towards improved land use."*

Policy harmony

Worldwide, forest and land use policy remains a critical issue. This is because few improvements in the sustainability of forest and land use have been observed, despite the completion of a growing number of policy and planning exercises.

IIED believes that Land Use failures are due in part to policy failure.

Policy Failure is variously a function of:

* Poor information;
* Poor analysis: and inability to deal with multiple dimensions (social, economic,

environmental, institutional) now facing forestry and land use.

* Poor policy integration: conflict between sectoral policies.
* Poor participation: inadequate involvement in policy processes of stakeholders.

In his stimulating presentation Dr Tran Khai has discussed the likely increase in population in Vietnam, Dr Huyen has pointed out that the Land Law states that "The land belongs to the people in Vietnam". Increase in population presents a great challenge. Over-population can lead to unsustainable land use but it must also be remembered that people are the most valuable resource, and that where people understand and are fully involved in decisions relating to land use, the contributions of an increasing population to the protection and sustainability of natural resources can make resource use sustainable.

It is therefore considered essential in Vietnam to promote participatory decision making and responsibility in land use, and to support the people by clear and consistent policies in the relevant sectors. What is less understood is how to make effective links between the community and policy makers.

The Land Use Working Group has an important contribution to make to these issues and hence to the sustainable development of Vietnam.

During 1994 it was considered timely to review the current Land Use situation in Vietnam, and to assess the extent to which the Group has been able to contribute to progress. The Group has been expanding and forming international links. In particular there is a willingness for international colleagues, including members of the International Institute for Environment and Development, certain members of the Royal Society of the United Kingdom, and of the Natural Environment Research Council (NERC) of that country to work together with the Land Use Working Group to develop a major project to help implement government policy.

It is likely that such a project will focus on reclamation of bare land (NERC has particular skills and experience in soil restoration) and on the reestablishment of native timber species, preliminary work on which has already been completed by Professor Hoang Hoe. The project would also look at the marketing of native timbers and the equitable distribution of profits and benefits amongst tree growers and land users. It is hoped to attract financial support from the Asian Development Bank, the Government of the UK and the Government of Vietnam. Core support for the Land Use Working Group is currently being made available from the Government of Germany.

5 FOREST DEVELOPMENT STRATEGY AND SUSTAINABLE LAND USE IN VIETNAM

by Nguyen Cat Giao, Director of Planning Department, National Coordinator of TFAP, Ministry of Forestry

Renovation of policy in Vietnam has brought about outstanding results, inflation has been pushed back, food production is in surplus for export, economic growth is 6-8% annually. However, Vietnam is still facing new and very serious challenges. The technology of production remains backward, national income per capita is below 200 USD/year, the infrastructure basis is weak, and the population growth rate is high (2% per year), environmental and ecological conditions in general and forest resources in particular are seriously degraded. Setting out a forestry development strategy suitable for Vietnamese conditions is of significance:

The main objectives and tasks from today towards the year 2005.

* To protect existing forests, endangered and valuable animal and plant genetic sources and biodiversity.

* To regreen denuded land and barren hills by agroforestry technology and to conserve water and soil resources. The Government has set out a target of 5 million ha to be planted in the next 10 years.

* To develop forest industry, to raise the quality of forest products to meet the demand of local and world markets.

* To improve the living conditions of 24 million upland farmers, especially 3 million farmers practising shifting cultivation.

In order to achieve the above objectives, the Government promulgated the Law on Forest Protection and Development on 19 August 1991, the revised land law, and under-law documents regarding agricultural land, forest land and forest inspection. Theses documents act as a legal basis creating a moving force for forestry development in a comprehensive,and carefully discussed format. In order to put this Law into life, the Forestry Sector has established a national programme on forest protection and regreening of barren hills and mountains. The Government has authorized this programme to be implemented since 1993 in pursuant to Decision 327/CT dated 15/7/1993. This programme covers the main following activities:

* To carry out forest land use planning and allocation of forest land to state-owned and non-State sectors for right to use the land on a sustainable and long term basis. It is clear that Land use right will be given to the farmers in the mountainous areas encouraging them to protect forest and conserve land and water sources, from which they can generate more agroforestry products to meet the needs of their livelihood.

* To provide agriculture and forestry extension services to the farmers so that they can apply appropriate upland farming systems. After receiving the forest land allocated, each farmer household has an opportunity to use a larger area as compared with the delta area, thus, they need to know how to protect, maintain, plant forest and non-wood trees, cash crops and animal breeding. Each ethnic group in the mountainous area has accumulated valuable experience on agroforestry appropriate to each local condition. Therefore, application of their experiences in practice may avoid errors and failures which should not have occurred. At the same time, extension knowledge on proper and new farming systems suitable in local condition and with participation of scientists and agriculture and forestry, extensionists from Central down to local levels. Experienced farmer knows how to work and generate income can be commonly met in any village or commune. Thus, the method of attracting them to participate in extension work proves to be the most efficient, with visible results and less expenses. If these households themselves conduct this work in good manner, then, becoming a good demonstration model as a highly persuasive force encouraging other neighbouring households to follow. It can be said that encouraging and creating conditions by allocating to the farmer households one area of protection forest and land on the hill slopes for planting perennial trees and cash crops on the hill foot basing on the system: Garden-Fish pond-animal husbandry (VAC) is the best way to perforce the principle of sustainable land use under the condition of Vietnam.

Regarding *rural credit development*, loans provided to each individual household. Result from a rural survey showed that more or less 50% of the mountainous rural people are so poor that they have no investment for production. Therefore, loans with low interest should be supported to the poor farmers who can apply different intensive measures and put the allocated land into sustainable use. Investments provided to the farmer households not only create opportunities for them to enrich their economy but also reduce pressure upon existing natural forests, if doing so, major projects on watershed management conducted might be prospected with required satisfaction. Development of rural credit will generate many jobs and expand market opportunities for consuming agricultural and forest products.

Assistance in rural infrastructure and rehabilitation of rural community. One of the main reasons leading to poverty and serious forest and land deration is poorly developed infrastructure in rural mountainous areas which prevent from commodity circulation and raise people's knowledge. Infrastructure development in the mountainous areas is, however, very costly while Government is facing limited investment. Therefore, in the National Programme 327-CT as already mentioned above building roads, bridges, irrigation, electricity etc should be gradually developed relying on local sources. Apart from key projects to be invested by the Government, other small-scale infrastructure projects at village level will be supported by the Government in kinds of materials and the remaining mainly base on labour contributed be the farmers.

One of the key issues is *manpower training and capacity strengthening for implementing the Programme 327*. The National Programme 327-CT is a long term programme speeding over all mountainous provinces of Vietnam. The Programme has just started in

mid-1993, until now, the Government has already approved 1200 projects with a total investment capital of 600 billion VND annually. Thus, personnel training becomes imperative in order to raise the capacity of implementing this Programme.

It is planned that 5 million ha of forest land will be allocated to one millions of mountainous farmers according to the Decree 02-CP of the Government. This is a big and very complicated job. As most of the mountainous farmers come from different ethnic minority groups with varied knowledge, there should be an option developed in a simplified form, but in line with the law and regulations. If the method is correctly prepared we still need qualified persons to perform it in the field. If we continue to proceed the old way as we conduct at present, it costs about 8 USD/ha and will take many decades. The Government, however, tries to speed up this process.

6 AGRICULTURAL DEVELOPMENT AND FOOD SECURITY

by Professor Ton That Chieu, National Project Manager GCPS/RAS/140/ITA (VIE), Ministry of Agriculture and Food Industry

Food security is the first work that every State has to do. A country can be of fair stature and a nation can be of high civilization only when the people do not suffer from hunger, the environment is not destroyed, the soil fertility is not destroyed, the natural resources are not exhausted, catastrophe is avoided and calamities are overcome.

So what have we achieved and what do we now need to do?

1 The current situation and approach to ensuring food security in Vietnam

In 1992 our population reached more than 70 million people (in 1930 it was only 17.5 million, but in 1993 the figure has become 73 million). It has taken 60 years for us to regain the level of food per capita in 1930 (1930:323 kg, 1989:333 kg and 1993:355 kg food per capita, Table 1,2,3).

Changes since 1930

In this short period of time, facing the challenge of food deficiency our nation had to suffer great bitterness. In the past, the problem was acute because of the exploitation of men by men and of natural calamities.

Before 1945 there were a number of famines caused by dyke failures. From the late 10th century to the late 19th century there were at least 188 years with floods and 171 years when severe drought occurred on a large scale causing harvest failure and famines. In 1945 millions of people died of hunger.

From 1985 to 1988 we had to import 540,000-740,000 tons of food. Rice-lands and the bare lands cover one third of the territory. The land resources are not appropriately used and floods become more frequent destroying many housing quarters, transport, economic and cultural constructions.

Almost of all hilly and mountainous lands of Vietnam overcoming a profound weathering have lost the fertile elements inherited from the parent materials. Precious humus compounds accumulated in the soil surface layers and playing a decisive role in the formation of the humid tropical soils, have been basically leached and destroyed. Attempt to reconstitute these lands appears too expensive and time consuming, even some generations are needed, however, if it could be done, one could not reach the initial level.

In many locations, water resources have been exhausted and unstable. The climate also varies causing numerous obstacles for the life and production as a consequence of fairly strong changes in the natural environment.

New and prospective changes after the innovation policies (1989)

After the innovation policies implementation, the development has made firm steps thanks to the policies on land management, production and circulation which are welcomed by farmers and the application of the new scientific and technological progresses.

This turning point is illustrated in the following table.

Items	Average for each period		
	1976-80	1981-88	1989-93
Total food production (rice -equivalent, million ton)	13.3	17.6	22.7
Of which : Rice	11.0	15.2	20.2
Per capita food (rice-equivalent) kg year^{-1}	254	294	335

Thanks to the consistent increase of food production in the whole country during the last five years, the food output can not only suffice for in-country demands, but also ensure a stable amount of rice for export every year.

Rice exported by some countries and Vietnam (million tons)

Countries	1989	1990	1991	1992
Thailand	6.0	3.9	4.0	4.6
United States of America	3.0	2.4	2.2	2.2
Vietnam	1.4	1.5	1.0	2.0

In 1993 and 1994 the rice amount to be annually exported is expected to be the same as in 1992. The income provided by exported rice presents a high proportion among the export values contributed by the other agricultural products. In this regard, exported rice value is at a second place after the oil.

Unstable factors

- *Climatic changes* causing harvest loss:
  - In the South, floods are commonly repeated every ten years. They occurred, for example, in 1978, 1987 and early 1994 and because of them approximate 0.5-1.0 ton of rice been lost each time.
  - Cold weather often happens in the North and in some provinces of the Central. The cold wave occurred in the winter-spring 1990-1991 in the North during the rice flowering period has caused o loss of 1.4 million tons of paddies.

- Typhoons followed by floods and droughts are frequent. Because of them in 1993, in 10 provinces of the Central, two rice crops were lost causing a damage of estimated 30 000-40 000 ton of paddies.
- Pests and diseases often seriously damage the crops. In the winter-spring period of 1992-1993, plant-hoppers have lost up to 1 million tons of paddies in the Mekong delta.

Nationwide and over the years, these damages are difficult. However, fortunately the impact of these natural conditions. For instance, it is often that when the harvest of winter-spring rice is lost in the North, the harvest is expected bountiful in the South. Also, if the weather is not favourable in the winter-spring period, it becomes more favourable in the summer-autumn, instead.

For gaining food, in certain locations of the middle and mountain zones, clearing and burning forests are still practised causing a lot of damages for the biological resources and environment. This makes the agriculture unsustainable.

- Effectiveness of the rice production is still low. So, farmers in many locations are regulating their options towards the other products that provide more economic effect. Big changes are taking place in the land use pattern requires to study and work out appropriate policies.

- The production of agricultural products in general, and food in particular, are not really oriented on those of high purity and the environment protection. It is imperative step by step to eliminate the use of toxic applicants and to control the environment pollution

Possibility to ensure food security in the future

- Land resources inventory: Land areas suitable for food production (including rice and cereals) are not large. Out of the total, the highly suitable area presents only 9%, suitable area:19%, less suitable area:9% and non-suitable one is up to 63%. From the economic effect point of view, the area to be additionally extended for rice production is only about 200 000 ha.

- Potential to increase the number of crops:it is possible to have an additional sown area of 300 000 ha for rice (from present 6.4 million ha to 6-7 million ha). Increasing sown areas for cereal crops, especially in the winter-spring season in the North, is also possible.

- Potential to increase yields: we have conditions and are in position to get and additional increase of 500 kg of rice per ha per crop and about 1000 kg corn per ha per crop in average.

- Population and relevant issues: Demographic studies forecast that if the growth rate reduces (from present 2.2% down to 1.2-1.2 as planned), our population will be 100 million persons in 2015 and when it will enter into the stable establishment stage with a growth rate of 0.1-0.3%, it will be about 140 million persons.

An estimate of food required for the year 2000 has been done accounting 70-75% of the total nutrients ensuring 2300 cal./person/day plus the other amounts needed as raw materials for the processing industry and for export. The results showed that the total requirement of food (paddies-equivalent) in 2000 is about 26-27 million tons which is not for from our reach.

In the further periods, for instance, in 2015 with a population of about 100 million persons it will need 33-34 million tons of food (paddies-equivalent). This figure can be also reached by combining some solutions:

- modifying the diet composition with reduced rice and increased other components;
- increasing rice yield and number of crop-seasons on the rice soils.
- developing corn by increasing number of crop-seasons, expanding corn areas on the flat and gently sloping land, applying high technologies;
- the policies will be perfected to improve the production effectiveness, promoting farmers to produce more food; and so on.

2 Diversification of products and development of sustainable systems

Results achieved

Food security in nation level is a concern of first plan for every countries. The international advanced approach on food security in national level account:

- Sufficient food provision;
- Stable food provision; and
- Approaching farmer households' food.

We are trying to get all three targets by implementing many programs on production and circulation, rural development, eradication of hunger and reduction of poverty, etc. As far as a long term development concerned, there are still various factors which can not be forecasted with sure, for example, the dynamic of population, the irregularity of climate, the regional and international relationship in terms of food, and so on. These forces us to be watchful on the situation.

It is noted that the capacity for food production has caught up with population growth and the surplus amounts of rice for sale in two big plains, the Red river and the Mekong deltas, have reached 6-7 million tons annually, serving a firm basis to enter the next stage of development.

Food solutions now and further should aim at ensuring the above mentioned targets and meantime, to redeem the losses that were made in the past. It should intensify rice and other food crops in the flatland which occupy 28% of the total land resources (including the highly suitable and suitable lands). At the same time, it requires to diversify the products in the middle and mountainous regions, avoiding to grow food crops where the soils are not suitable. In this direction we can develop a sustainable agriculture with pure products.

For *regreening* more than 10 million ha of bare land and denuded hills, it is necessary to integrate the lives of millions of farmer sustainable agriculture without land degradation.

- Development of perennial crops: There are now 70 000 ha tea, and additional area of 50 000 ha can ben extended. With the present 130 000 ha of coffee, this crop area can be enlarged on an additional 70 000 ha more.

  Beside 230 000 ha rubber in this year, 100 000 - 120 000 ha is potential to be expanded with attention paid on using the cold tolerant varieties for the northern provinces.

  High potential is for fruit crops which can be grown over the country. The present area is 181 000 ha, and 200 000 ha can be grown more.

  An abundant set of medical plants and those of special value can be developed in combination with precious wood trees.

- Other branches of production :

  All-sided development of livestock husbandry, aquatic production, product processing... can provide large good stocks for circulation, and hence, to profit the advantages of each economic zones.

- Develop various manners of contracts between the state and farmer households in land allocation, forest protection, forest planting... will rapidly close the highlanders' lives to the regreening the lands.

In certain ecological zones the present production systems are not fit for sustainable development. Fore example, in the depressed areas, an enormous energy has to be spent to drainage for summer rice.

Too hard and expensive are also the washing salts from the coastal marine saline soils or the toxic elements from the proper acid-sulphate soils.

For these cases, it is imperative to reset the production direction, rearrangement of crop and animal pattern, to find out the appropriate models which can provide higher economic effect and meantime, to profit the advantages of natural resources and environment.

3 Brief opinions

* In Vietnam, the unsustainable production systems are prevailing on most of the upland areas which account for three quarters of the total territory They can be found also in the special ecological zones like the saline, acid-sulphate or depressed areas as a consequence of the inappropriate land use which is not fit for the potential and advantages of these zones and of the food solution in the previous difficult time.

* The basis for transformation towards a sustainable production is to change the

orientation and manner of land use. In the nation scale, it means the re-arrangement of the structure of agricultural production in consideration of the ecological features and market development, solution of the food security on a new approach.

* Sustainable land use presents application of the technical packages to control leaching and degradation, protection and improvement of soil fertility, maximal utilization of solar energy and soil depth in terms of time and space; for the special ecological zones it means to choose the appropriate direction.

* In the hilly and mountainous zones, beside the food crops grown on the flat and gently sloping lands with appropriate protective construction, it is necessary to choose the suitable perennial plants above-presented, along with forest trees systems, combined with protective forest, protection and development of forest areas of different species, creation of a harmony between men and nature, establishing the sustainable ecological regions.

7 EXPERIENCES IN FOREST LAND ALLOCATION IN A COMMUNE IN HOA BINH PROVINCE

Dr. Vu Van Me, Ministry of Forestry

Forest land allocation is a long term, strategic policy for forestry development: it aims, by increasing reliance on the people, to introduce effective and sustainable use of forest land and forest resources, and improvement of the peasant household economy in the midland and mountainous region.

Although this policy was introduced more than 20 years ago, implementation has been very limited. Largely because there has been a lack of coordination between foresters and those who voluntarily participate in the process.

Experiences over more than 20 years in forest land allocation indicate that new efforts to forest land allocation are necessary. In Hoa Binh Province the Ministry of Forestry with the People's Committee began implementation in two communes:

- Tu Ne commune (Tan Lac district) is a commune in a low hill region with more than 80% of the population belonging to Muong ethnic minority. Here there is much paddy and also protection and production forests.

- Hang Kia and Pa Co (Mai Chau District) lie in the high mountain Region and are inhabited by a single H'mong ethnic minority. The people here mainly live by shifting cultivation. Lands for agricultural production are scarce. There are no paddy fields.

Application of this new method for allocation of forest land showed that the whole forest land fund, 1.130 ha, of Tu Ne commune was received by 444 peasant households and these house holds have been granted land certificates allowing the use of land for forest undertaking and forest protection. In the two communes Hang Kia - Pa Co, 1.800 ha of forest land have been allocated to 351 household of the H'mong ethnic minority for management and use for forestry purposes. These households were assigned definite forest areas for protection for which they would be paid.

During the 8 months since the forest and forest lands have had "real masters", natural forests and state-invested forest plantation have been made use of by households for production. It is believed that shifting cultivation, encroachment on lands for illegal cultivation, forest clearing have been almost entirely discontinued. On the other hand as the households themselves assume the task of protecting their own forests, the District forest protection service has been able to concentrate its effort on forest land allocation in other communes. These results have been so impressive that Hoa Binh Province is extending the work as far as possible.

The following approach to land allocation is recommended:

Step 1: Establishment of a forest land allocation steering committee

This is a staff body formed by the district chairman to guide forest land allocation in the District. The members of the steering committee are chairman or vice-chairman of the district-Head of the committee; Head of District Forest protection Service-Vice Head of the committee. In addition there are 3 committee members: Head of District Agricultural and Forest Section, Head of District land management Section and a representative of related branches.

The responsibility of the committee is: to work out a forest land allocation plan for the whole District; to guide the working teams in implementation work in the commune; to give advice to the district chairman in approving the land use planning of the commune, completing forest land allocation document to send to district cadastral office for the procedures to grant land-use certificates to the household by the district chairman.

The District Chairman issues a decision on the working team formation. The team has 3-4 members: forest protection, agricultural, cadastral cadres of the commune, representative of People's committee of the commune, a representative of state organizations having forest lands in the commune area. There can be added cadres in change of fixed cultivation and sedentary life if this program has been carried out in the region. Cadastral cadre and leader of the commune must necessarily follow the work in their commune from the beginning to the end.

Cadres in charge of the organization are required to firmly grasp the law on land, law on forest protection and development, governmental decisions of the Prime Minister on forest land allocation. On the other hand they must be specialized and have experiences in forest survey and planning. In case these cadres are still weak in their profession, demonstration course must be organized for their training.

The working teams are directly managed by the District Steering Committee, the bodies that together with the commune authority and the people carry out all pieces of work concerning forest land allocation in the commune.

Step 2: Assemble all necessary information

The collection of information relating to land and forest resources in the commune area before carrying out forest land allocation is essential. It makes implementation efficient.The information needed includes : area and distribution of the land types; people's life, socio-economic conditions such as : the ethnic minorities, population, labour force, income, the number of households still practising shifting cultivation, land area illegally cultivated, demand of the households on right to land-use... result of previous forest land allocation, status of natural and manmade forests that still need management and protection, land use planning and plan of the commune.

In case of lacking important information items such as data and map on present land use situation in the commune, land use planning of the commune, it is necessarily of conduct supplementary survey for their completion. There must also be topographical map of the commune, scale 1/5.000-1/25.000. In case there is not such topographical map as

mentioned above, 1/50,000 map is used instead, enlarged and adding of the details is done on the fields.

Step 3: Constructing land-use plan and forest land allocation planning

On land use planning: Actually now the majority of commune have already conducted land use planning but there are also communes are other land types. Sufficient agricultural lands and must be set aside for the peasant households to meet urgent requirement for land for food and subsidiary food crops cultivation. Only the remaining forest lands are allocated to the people. Thus some communes must transfer part of the bare lands previously called forests lands to agricultural lands but absolutely forest lands presently under forests must not be transferred to agricultural production within the area of the commune if there are lands now under the management of state organizations their boundaries must be clearly defined in the planning and shown on the fields and map.

In this planning, discussion must be held with each household. The people must clearly know their rights and obligations in receiving the land, the forest and the way to do the allocation. Where this preparation step is not done, difficulties will arise, and progress be slowed down. This is ready an important preparation step for the subsequent forest land allocation.

In the planning there must also be made clear the measure for protection of the remaining natural forests during the preparation for and the allocation itself, avoiding the ready use of the time when the forests do not yet have masters for careless cutting.

Step 4: Holding meetings with the people in each hamlet (or cooperative)

First meeting : to announce the forest land allocation. There must be present all the chiefs of households in the hamlet (or cooperative), commune leaders, cadres of the working team.

In the meeting there must be introduced the main points in the way of forest land allocation as advanced in the planning, explaining the rights and obligations of the land masters as expounded in the laws, governmental decisions and instructions on forest land allocation of the Ministry of Forest in which emphasis is laid upon such basic points as land is only allocated to the households that have the requirement and submit application on receiving forest land, no compulsion.

Those households that are having slash-and-burn cultivation plot (s) but do not make written report about them then the plots must be returned to the commune to hand over to other households, individuals that have requirement.

Second meeting: On the basis of the households application for receiving forest land, based on the land fund, land-use planning, number of members in each household, the cadres in the working team together with the Head of hamlet (cooperative) preliminarily decide on paper the area and location of the forest lands (under forests, vegetation and without forests) to be allocated to the households. After that there convened the households in the hamlet who have requirement in using forest land to announce this

preliminary decision. If there remain any disagreements of the households, the working team and Head of the hamlet must reconsider the matter for rational and sensible adjustments, ensuring, social fairness and rural stabilization.

This is the document for allocation and receiving land on the field.

Step 5: Land allocation and receiving on the field

- Being present: Head of households receiving land, working team. Head of the hamlet.

- The households the plots of land of which are adjacent to each other come to the agreement on the land boundary with the help of the working team and the witness of the Head of hamlet (cooperative).

- Head of the households identify the position of the land plots on the field, mark the boundaries by streams, hill crest lines, bushes of trees, digging ditches and trenches.

- Signing the document on forest land allocation on the field.

- Cadres of the working team make their writing and draw the plots just received by the households on enlarged topographical map, scale 1/5.000 to 1/25.000. After finishing the land allocation to the households there will be the original map on the result of land and forests allocation in the whole commune. During the land allocation on the field if there need be any supplements, adjustments in land use planning (step 3) the working team must report to the steering committee for timely decision.

Step 6: Indoor work

- Data gathering, making a list of the area of forest land plots that have been allocated to the households. Holding meeting with the households that have received forest land in each hamlet (cooperative) to announce the last time on the type of land, position, area of the plots that have been allocated to the households. Any queries raised by the households must be cleared and adjustments are made as needed. Only when full agreement and unanimity is reached among the people does the document become official one on the result of forest land allocation.

- Drawing map expressing the result of forest land allocation in the commune, indicating plots of land that have been allocated to the households.

- Completing the documents to be sent to the cadastral office for consideration and submission to the chairman of District People's Committee for granting land-use certificates.

Head of the district makes use of the divisions, sections of the district to guide the forest land allocation of which the forest protection section is the main force with close

coordination of agriculture, cadastral, fixed cultivation and sedentary life sections.

Relying on the commune administration the forest land allocation is concentrated in one round in the whole commune for all the three economic sector: state, households and private individuals.

- Every household in the hamlet is allowed democratic deliberations and to participate in the whole implementation process, ensuring social equity and rural stability.

- Establishing the right to master the forests and forest lands in the whole commune in two fundamental forms: totally assigning the right to land use and assigning long-term and stable tasks of forest protection and under take forest enclosure for natural succession in line with the planning of the three forest types as regulated by law.

8 LAND USE PLANNING AND LAND AND FOREST ALLOCATION IN PHONG DU COMMUNE, TIEN YEN DISTRICT, QUANG NINH PROVINCE

by Nguyen Ngoc Nhi, Forest Inventory and Planning Institute

1 Introduction

Phong Du is one of the mountainous commune in Tien Yen district Quang Ninh province with the area of 6.822 ha. Being located on the average altitude of 200 - 300 m hilly and rock type takes more than 85% of the land in the commune while agriculture land represents only 6,41%, out of which 3.47% (237 ha) are under rice cultivation. The population in the commune is 3075 persons from 480 households of different ethnic groups : Dao, Vang, San Chi and Kinh. The Dao represents 50.6% of the whole communal population. Given by the limited and degraded size of agriculture land which is impossible to meet the food requirements forest has been, since a long time ago, converted to upland cultivation area. The existing natural forest only covers 2.87% of the area while the environment is severely degraded.

A sound forest and land resources utilization system would be of crucial importance for the development of the local economics. Project GCP/INT/510/ITA in the framework of Tropical Forest Action Programme has selected Phong Du as the pilot area for the land use planning.

The traditional top-down centralized land use planning which was once suitable to the State-own institutions has proven out of date to the community land use planning on communal/village. And the participatory bottom up land use planning adjusted and suited to the regional plan is now treated as the basis for the work conducted by the team.

2 Main contents of land use planning

Clarification of land use: The Ministry of Forests has issued the official document on the functional-based forest classification which categorizes forest into: production, protection and special use forest. In principle this classification has been applied in Phon Du commune.

According to the 1993 Law on Land of Vietnam all the land in the country is claimed by the State Government who allocates the Land use title to the social and economic sectors.

Formerly in Phon Du with the exception of land under agriculture production all of the hills, and rocky areas were managed by the state forest enterprise. However, the Government of Vietnam recently has issued a policy on the land allocation to farm households for the development of production and effective protection of the existing forest resources.

Only land for production is allocated to farm households. And it is based on the size and significance of the land that the protection and special use forest is under the state or

community management. In Phon Du, several pieces of this land have been allocated to communal/village community for management.

3 Comments

* Communal land use planning and farmers' involvement in the process is quite new in Vietnam. More field practice is required to get :

  - the combination of professional expertise and local know-how as well as the role of local people
  - people's educational level and traditional practices.
  - different level of land use for different areas with different development process.

* Forest and land allocation to households has to be based on :

  - Needs of farmers and community for land use.
  - Land availability
  - Community tradition and practices
  - Less costly, simple and effective measures

Mistakes are unavoidable of forest and land allocation process is not based on the land use planning.

9 HOME GARDENS AND SOIL IMPROVEMENT

by Marc Langevin, OXFAM/Quebec

Summary

The project aims to provide training about fruit tree growing for 741 farmers and to establish fruit gardens in 3 communes of Phon Chau district, Vinh Phu province. The concrete objectives are: increase income for households, improve soil conditions and protect the environment. Time for carrying out the project is 3 years (1993-1996).

Soil: a priority

The project concentrated on soil improvement as it is the foundation of the botanical life, on it, fruit trees, vegetable can be grown in many years while fertility is improved and the environment is better maintained. The proposed techniques for farmers to apply are simple. however it's difficult for them to practise. In this paper, we don't intend to discuss about theories in soil improvement, we only show readers the way of application of basic techniques carried out by farmers themselves in gardening .

Assessment of soil in 3 communes

Home gardens are often located on hill side with the slope of 10-15% in average, and rarely exceed 25%. Most of them are clayey soil, peat and sandy soil. For the first 2 items (clayey soil and peat) it is observed that drainage process happens slowly. These soil types are very hard for farmers to dig, low fertility (less humus) there is also compaction and a hard clayey layer at the depth of 50 cm, beside other impacts, which all prevent the reaching out of the root system. Soil status in general changes greatly from alkaline to extreme alkaline and it is impossible for earth worms to live. Rainfall concentrates in June, July and August. In winter, the rate of evaporation is higher than rainfall, that results in irrigation.

The pH is very low, rainfall concentrated in a short time, the rate of humus also low, sloping is great and soil is exposed to the light which are serious factors that cause soil erosion seriously.

Some of the information was shown in "The assessment of hilly soil status in 3 communes Phu Loc, Hy Cuong, Tien Kien" reported by Nguyen Ngoc Nhi. From the general remarks said above on the land status, it is understood that priority must be given to soil improvement, fight against erosion, reduce the acidity in soil, increase the rate of humus in soil, in other word, increase the fertility in soil.

Proposed measures

Question on the cultivation conditions summarized above as well as the proposed measure to solve the problem are explained for farmers by means of lecturing for 2 days and practising in the field for one day (including fruit tree growing technique). Below are

proposed measures for farmers on long term soil improvement.

1. Arranging the soil rims: proposed arrangement - example. Source: Water and soil losses: Jean Louis and Hugues Dupriez. Document type: Soil and life; L'Harmattan publishing house - page 47.

2. Lime supplementation. Each soil type need different amount of lime supplementation, and as impossible for soil analysis for each garden, so it is based on only the low pH in general to propose a common amount of lime to supplement to soil. The proposed amount of quicklime is 10-15 kg for $100m^2$ depending on soil types and the supplement must be carried once a year or at least twice a year until the desired pH obtained.

3. Organic matter supplement. Compost, straw, hay, manure, production and utilization of a significant amount of organic matter is the proposed measure but we don't try to show their uses in this paper.

4. Vegetation cover. The legum varieties as beans, ground nuts, soya beans in between the newly-planted fruit tree rows (NFT, soil erosion control weed control, compost root system that makes soil.

5. Tree rows against soil erosion. Tephrosia candidate - a legume species are planted in *rows with right angle with the slope along the rims (NFT fence against erosion,* production of compost...)

Through the training courses theoretically and practically in the form of extension, the new knowledge is quickly and strongly grasped by the farmers. Ideas withdrawn from the training courses show that, the exchange of ideas among farmers themselves and trainers as well, farmers strongly support the 5 measures for home garden improvement. However, when the techniques are applied, the situation happens differently.

The application of the proposed measures

The application of soil improvement measures done by farmers was supported by 9 technicians distributing equally among these 3 communes. The technicians came and helped the farmers once or twice and the rest is done by farmers themselves that resulted in different outcomes.

General remarks

Results gained till now are quite uneven. Some of the farmers applied almost of the proposed measures in the initial stage of soil improvement. Most of the farmers applied some of the measures, and a part of farmers didn't applied the proposed measures. Based on the obtained results, it is observed that these is difference in the growth of numbers of species among different gardens. And this difference will be multiplied by time among the gardens with and without soil improvement measures. Before analysing the reasons that caused these differences, it is necessary to go through the technical remarks made after visiting the gardens.

Techniques

1. The arrangement of rim system. On the sloping sides, the system of rim for the whole garden or at least for the newly planted plants is not arranged. In some cases wide beds are prepared and the surface soil is good but a thin one and is buried and is replaced by another poor layer. Then, the farmers think that the fertility in the surface soil and the second layer is not much different, so it is no need to separate these two soil layers. the important thing is to compensate with enough organic matters. The wide beds were prepared very quickly. It's suggested that these beds should gradually prepared within a period of 2 or 3 years.

That is why when there is much rain great difference can be seen among gardens with and without rim system. Gardens without rims suffer from washing away, gullies appear and newly -planted individuals are buried partly.

2. Lime supplement. In some cases, not an amount of lime is not supplemented. Most of the farmers think of the difficulty in transportation of this material, as it is not simple to transport an amount of 50 kg of lime by bicycle. The reason is simple but it is a big obstacle in pH treatment for soil.

3. Organic matter supplement. Many of the farmers keep their traditional way of fertilizing by putting organic matter at the bottom of the holes that cause quite waste as the hole is 80 cm deep, and the organic matter at the top is not well distributed while concentrates in one place that results in low efficiency .e production of organic fertilizer is not carried out however technique has been guided as it is new to farmers. The common technique of preparing this types of fertilizer is the mixing manure with fresh leaves of different species, this yields high efficiency but limited by amount.

4. Vegetation cover. This consist of the legume species which applied by most farmers. The selection of short term legume species is helpful as it yields both income and vegetation cover, so farmers are willing to apply.

5. Tree lined against erosion. The growing of *Tephrosia candidate* is carried out by every one as it is easy to grow this species. However this species is nice so they are not grown in the right place. Farmers always grow them along the lane leading to their home, it is why the gardens don't enjoy the positive influence of *Tephrosia candidate.*

6. Growing. A lot of fruit trees (newly planted ones) were grown deeply in soil, so they can't grow up well or die. This is the traditional way of growing of the farmers as they always grow fruit trees by cutting so they must grow them deeply in soil to get enough humidity in dry season. This ought to be quite different if cuttings are grown in rainy season.

Notes: Techniques for the questions mentioned above have been shown to farmers practically and theoretically. Some of the gardens were improved, but farmers met with lots of difficulties in the application of new techniques as has already shown. There are different reasons.

The common difficulties met and reasons are as follows.

- Time consumption. It is noticed that, the poorest household must set aside a member to earn food for the day, as soil improvement takes time, so it's impossible for them to apply.

- Great difficulties in improving badly degraded soil as farmers can't harvest more products in a short time, so long term and medium term soil improvement is possible.

- Natural conditions of different gardens will certainly yield different results and influences as some need more labour force others need less.

- Whether the soil improvement measures are accepted. In the training courses for farmers, they put forth questions, get the explanation and give no objection contradiction only happens when new techniques are applied. No trials are made while farmers are very conservative in cultivation measures.

- Farmers never see a model which was established time ago, they don't have any chance to observe the practical results of the model where proposed measure were applied and confidence is still doubtful.

- Less of technicians.

Recommendations

It's observed that some of the gardens were improved, but there have still been many things need to be further improved to get highest results in the programs of soil improvement. Below are the general recommendations which possibly improve the implementation of such a improvement project.

- First of all, the question of belief them open and frank discussion between farmers and technicians must be realized in order to avoid mistake.

- Samples, experiments to compare with the old ones. Study tours ought to be organized.

- If possible figures about productivity between the old and the improved gardens must be shown to farmers as they are very much interested in final results. This question must not be ignored. the protection of soil, environment is certainly important but what and how much it bring about.

- Help farmers to grasp techniques of soil improvement. Much more attention ought to be paid to the practice as farmers don't get used to reading documents.

- Soil improvement must be carried out in different way long, medium and short terms and step by step.

- Short term species to give income should be applied right after the investment of labour to.

- The following up of technique application by the professional technicians with enthusiasm will ensure success for the project. Technicians help farmers apply new techniques to avoid mistakes and facilitate the application of the proposed measures and promote farmers' enthusiasm.

These are the main points that need attention. The difficulties can be overcome with great determination of the farmers as they are seeking ways to improve their life and one of the things to be done is long term soil improvement.

10 THE ROLE OF TAXES AND SUBSIDIES IN LAND USE

by Nguyen Xuan Vanh, State Planning Committee

1 Introduction: Decision 327-CT

The task of the planned migration of populations made by the government mainly aims at the re-distribution of labour force in other words moving people from the deltas to the Highlands and Midlands to establish the so-called "New Economic Zones". This has been done since the 1960s in the North. After the liberation of the South, people from the North moved into Southern provinces including the Western Highland, the Mekong river delta, the Southeastern Province.

The sedentarisation programme has its object resettlement of ethnic minority groups whose life depends on swidden cultivation. If no active measures are applied to this situation, shifting cultivation will continue to destroy the forest.

In general, the establishment of the new economic zones (NEZ) and sedentarisation and settled agriculture (SASA) has concentrated on the construction of the infra-structure, without identifying means of production for individual households. This has had disastrous results.

The protection of the existing forest , afforestation for watershed coastal production, nature reserves (national parks, nature reserves) production forest management invested by the State gained the initial results. Forest protection positively changed both in consciousness and action . Raw material areas for industrial use and export were established, but forest is still cut massively for timber and swidden. Afforested area annually is not so much (100-120 thousand ha per year), the rate of survival is low (50-60%) the indigenous species of high value cover a low percentage.

Long term cash crops development as rubber, coffee, tea, fruit tree is limited by investment so only 10 thousand ha are planted annually while land potential is rather large.

In short, the task of moving people into NEZ, the implementation of SASA, the protection of forest, greening the open lands and barren hills by afforestation , cash crops growing , pasture establishment for grazing cattle had been carrying out in many year and gained limited results due to lack of connection and co-operation among the sectors. Investment and investment way were not suitable, forest is still destroyed , open land get larger, lack of employment while labour force is available people's life is hard, particularly the case of the minorities.

To carry out the task mentioned above harmoniously, effectively both in economic and environment on the large scale in the Highland and Midland, president of the Council of Ministers (known as Prime Minister nowadays) promulgated Decision 327-CT on 15/9/1992 "On the policy of the use of open land and barren hills, forests, alluvium shores, water bodies."

2 Tasks and Objectives of 327 programme

The important objective is to protect the 9.2 million ha of the existing forest, use effectively 10 million ha of open land and barren hill, that is why this Programme aims at the following major objectives:

- protect the existing forest is the most important task as forest loss every year is still happening due to slash and burn practice of the shifting cultivators;
- cover all the open land by afforestation, natural regeneration growing long term cash crops , fruit trees , improvement and establishment of pasture for raising cattle;
- forest protection must be closely connected to the solving of shifting cultivation;
- reasonably move people from the over populated areas to the highland and midland, create more employment to contribute to the adjustment of population density among the regions.

3 Measures for the implementation of the Programme

3.1 Important papers for the implementation of 327- programme

When the Decision 327 came into being, Government Office issued paper 507/KTN, 15/2/1993 on the decision of the Prime Minister referring to the implementation of 327-CT, which concertize objectives, tasks, measures for implementation appointing officers of different concerning sectors and establishing Central and Provincial Managing Boards. Realizing this Decision, Ministries and Sectors of concern speed up the guidance.

- State planning committee: Guideline No.03/UB-NLN (29.4.1993) on the appraisal, approvement of projects, working out plans.
- Ministry of Finance: Guideline No.32/CT-DT (7.4.1993) and 13CT/DT (28.2.1994) on the management, granting loans as said in Decision 327-CT.
- State Treasure: No.199 KB/CD (17.4.1993) concrete guide for granting loans according to 327 programme.
- Ministry of Labour and War Invalid and Social Affairs: 07/LD-TBXH 12.5.1993 on the subsidy for households moving to NEZ as said in Decision 327.

Besides, the Ministries of Agriculture, Forestry, Food industry, Committee of ethnic minority and Highland , the General Department of Land Management (known as the General Department of Cadastral nowadays) worked out papers by their sectors for the implementation of the programme.

In brief , the Programme has been fully charterised by papers made by ministries, sectors of concern from appraisal, approvement, targeting, routine for granting loans.

3.2 Way of investment to 327 programme

The investment must based on the projects consisting of:

Project of SASA agriculture and forestry. Project of SASA forestry and agriculture and Project of independent SASA which appraised by the specialized Ministry and approved by Provincial People's Committee or by Minister of a certain sector.

Within the scale of project of Forestry and Agriculture or Agriculture and Forestry there exist shifting cultivators, then the State Forest production enterprise or State Farm must be responsible for the management and distribution of the investment source to the households and don't let them do shifting cultivation again. The independent projects are not in the managed areas of the State management units are run by provinces.

The Investment Projects of different types: Forest protection, Afforestation, Long term Cash crops, fruit crops, pasture improvement, raising cattle. Home gardens, infrastructure construction (road, irrigation system ...) common welfare: schools, dispensaries , wells for clean water. That is to say that 327 is a Socio-economic project . Services at both ends are done by Project Managers , households are executors , and investment reaches to each household . Beside the investment source of the 327 programme. Other big works as road and irrigation system, schools, dispensaries, sectors of concern must be responsible for.

3.3 Allocating forest and forest land by contract to each household

This is not only a policy but an initial important measure as well in the implementation of the 327 programme in order to identify clearly the real owners of land allocated .

Land allocation means allocating the rights of long term land use to farmers for production as planned. At the same time forest and forest land are allocated to farmers by contract for protection or afforestation.

- Protect forest and afforestation: + 30 ha
- Land for gardens: 0.5 ha
- Long term cash crops, pasture: 1-2 ha

Depending on the land source remains, P.P. Committees decide how much will be allocated. After land is allocated and forest is allocated for protection by contract, the land and forest have real owners with rights of use, the state will invest to the protection of the existing forest, enriching the poor sites, afforestation at the same time grants loans without interest for cash crops, fruit trees growing, household economic development or raising cattle.

3.4 Carry out Agro-forestry practice (AFP)

AFP must be carried out within each project and each household. Due to the washing away, terrain condition forest and open land are alternated by each other, that is to say that AFP is the most effective measure to protect the soil. To protect the forest it is very important to develop agriculture, diversify the varieties of plants and animals. In the initial years (say 2 or 3 or 4) inter cropping of food species must be practised on the sites of the forest trees or fruit trees.

3.5 Investment policy

The Government encourages different sectors, economic components to participate in exploiting the open land. In this paper, it deals with only the investment of the government to the projects belonging to 327 programme, which consists of the following.

Hand out capital

Objectives to be invested by this kind of capital are those who deal with forest protection afforestation in watershed areas via a contract to deal with government requirements, certainly they are allowed to enjoy products made by agroforestry activities.

- Investment levels:

Forest Protection	VND 50,000/ha
Afforestation	VND 1.2 million/ha (first year)
Tending till established	VND 300,000 each year on average

- Supported investment for infra-structure construction (interroad, irrigation system) common welfare (schools, dispensaries, cleaner water) in the project area. Beside those, other big works as: main road and irrigation system, schools, dispensaries in the region must be invested by the sectors.

Loans granted without interest paid (Government's)

This loan goes directly to farmer households, when they get products from their cultivation they then pay the loans.

- For long term cash crops, fruit trees growing. Depending on plants, trees to be grown, the sum may range from 2.5 - 4 million Dong per ha for the fist year, and a million for the following year.

- For home garden practice: VND 1 million per ha to buy seedlings (each household gets 0.5 ha say 0.5 million Dong to be granted), no more for the following years.

- For raising cattle: 1-2 cows or buffalos, a million Dong per head on average. Depending on the condition of the households Project Manager will decide how much will be granted.

This is a special priority policy of the government to help the poor their economic condition. Beside this, farmers can borrow money from investment credit with low interest (0.7% month). Borrowing from Employment Fund: 0.6; 0.9; 1.2% /month, for afforestation for raw material, loan is granted as regulated by Decision 214-CT (22.7.1992) of the Government.

Fund for stretching out population density

The Government set aside fund for mobilization of labour force to the project areas within and without the region, which consists of 3 levels.

- From North to South: 3,890,000 Dong per household (Transportation of human being and their materials, purchasing tools for production, house building and food for 6 months).

- Inter region movement: 2,400,000 Dong per household (items said above)

- Inter province movement: 1.490,000 Dong per household. As regard those households lying within the project area due to the expansion of the project production purpose in connection to forestry practice, home garden economic practice, 0.8-1.0 million Dong will be subsidized (a million Dong for minority household who are still applying shifting cultivation) for houses. This level of subsidy is regulated in the Paper No.07/LD-TBXH (12.5.1993) of the Ministry of Labour, WI and SA.

Fund from Programme Management overhead

Decision 327 regulates the level of 5-6% of the total fund of the Programme for the management task which consists of the following:

- Cost for project construction (investment preparation)

- Review construction cost of open land to serve 327 programme (Sector and provincial review).

- Cost for forestry and agriculture extension, establishing model of transfer of Technology (TOT) on the basic of approved terms of references.

- Cost for management overhead of the Central managing board, ministries, provinces and Project master.

3.6 Agriculture, forestry extension, model of TOT establishment

Objects to be enjoyed priority of 327 Programme are Highland and Midland areas as people in those areas are of poor conditions and low knowledge. So the agriculture and forestry extension is necessary, model of cultivation, raising castles, rearing fish afforestation, application of techniques, agroforestry technique must be transferred to work out samples. To do this, a body of technicians, extensionists with experience must

come up to farmers and directly help then do as we wish. It's safe to say that, the task of agriculture and forestry extension is a decisive role that decides the success of the 327 programme.

3.7 Conducting the implementation

Through 2 years of the implementation of the programme, problems were withdrawn from central down to local levels to timely consolidate and supplement.

- The Provincial Peoples' Committee must conduct concentratedly, connects activities of the specialized departments, by so doing, the speeding up of the programme will be favourably which facilitates the carrying out of the programme.

- If the Project Masters are the state business units (enterprise, state farm...) the results obtained are rather good as they have enough managing officers, technique experience in conducting the implementation as the state units are carrying out services at both ends of the project.

- Projects run by districts as the case of New Economic Zones, Sedentarisation and Settled Agriculture in the past gained too low or limited results as lack of officers while remote conducting was applied, and no professionals in charged.

In short, the conducting from central down to local levels are of great necessity that decides the success of the programme. That is why it is necessary to consolidate re-organize timely. There must be concentrated conduction, enough professional officers particularly at the provincial level, as it directly conduct every activity during the performance of the project. Officers must be experienced and enthusiastic and closely link with the farmers, to the field.

327 Programme is a National Programme, it happens specially in the Highland and Midland areas and is welcome by the local government and people as well. However, the State is in difficulties, in 1993, 537 billion Dong were invested- 1994 - 540 billion Dong, 1995 tentative 600-700 billion Dong will be invested to this programme.

As said in paper 2908/KTN (16/6/1993) about the conclusion of the Prime Minister on the implementation of the programme:

> Carry out 327 programme is to actively, importantly contribute to the programmes of employment, abolishment of hunger and poverty, improvement of rural economic conditions, re-adjustment of labour force over the territory at the time it has positive benefit for the protection restoration the ecological environment.

11 COOPERATION BETWEEN STATE ORGANIZATIONS AND FARMERS

by Nguyen Van Viet, Director of the Forestry Department, Bac Thai province

Bac Thai province has 650,288 ha of natural land, forestry land covers 49,615 ha or 66% of the total, forestry land per capita is 0,4 ha, whilst agricultural land per capita is only 0,07 ha. Most of the territory of the Province is sloping land, there are only 222,325 ha with a slope of less than 12°, the remainder has slopes between 12-35° or is rock. There is only 170,000 ha of forested land, whilst open land and barren hills cover 259.000 ha.

Challenged by such a situation, Bac Thai forestry sector is aware that it is of utmost importance to protect the remaining forest (170,000 ha), and to speed up enrichment, regeneration and new afforestation. By the year 2010, 325,000 ha of new forest will be established and forest will cover about 50% of the land. More attention will be paid to the species planted, and better cultivation measures will be introduced to protect soil against erosion and degradation, and to improve fertility.

It is intended to improve planning and to establish the areas needed for:

- nature reserves
- protected forest and
- production forest.

By the end of 1993, 81,259 ha were allocated to 27,630 households which included 35,265 ha of forested land and 45,992 ha of non-forested land. Besides, there are 30,000 ha of plantation established by the World Food Programmme (WFP). Of which 3,352 ha of the plantation have been allocated to households. The procedure is being perfected to allocate all plantation to households.

Based on the Land Law and the Law of Forest Protection and Development, the People's Committee of Bac Thai Province introduced regulations for land allocation and forest protection contracts for farmers for long term utilization. Farmers will have the right: to decide on management measures; to inheritance; and to transfer. The households who get land and forest will also enjoy the priority policy of subsidized loan and technical services to assist with forest protection and development.

In studying the strategy for sector development and carrying out the function of state management of forestry in the territory of the province, the Forestry Department has a first priority aim to protect the existing forest area, it is also concerned with forest rehabilitation by enrichment, regeneration, and afforestation. The Forestry Department also wishes to create favorable conditions for farmers to practice agro-forestry. With the assistance of the WFP since 1989, 39,600 ha have been planted (plantation, fruit trees, cash crops on sloping land) which contributes to the greening programme in the southern districts of the Province: Phu Binh, Pho Yen, Song Kong and Thai Nguyen. Some households own forest gardens, or forestry farms and manage their land profitably and sustainably. There are traditional models of sloping land use which have been perfected

with assistance from the Forestry Department. In the past, 5200 households practised shifting cultivation. Nowadays they are participating in forest protection as they have help from the Forestry Department, they also grow fruit trees and raise cattle and food crops. Forest losses have reduced significantly.

In recent years, the rate of afforestation has increased but it hasn't caught up with the rate of forest destruction due to uncontrolled slash and burn practices.

The reasons for these weaknesses in forestry land use are due:

- firstly, to the farmer holding no responsibility for the management of forest lands. Farmers were moved away from the forest under the sedentarisation programme, and the state enterprises covered a very large area. The farmer households and the local communities were employees for the enterprises, that's why they paid no attention to land use and land management, and the land management ability of the enterprises was limited;

- secondly, the policy to solve the shifting cultivation problem in the past was not strong enough;

- thirdly, there wasn't a professional organization responsible for extension activities to help farmers use their allocated forest land in a planned manner.

From this general assessment it can be seen that:

- Suitable forestry land areas have been converted to agricultural production, especially the growing of fruit tree with high commodity value.

- The role of extension agents is critical.

Forestry officers must be fully aware of this role and must be able to choose measures of land use suitable for farmers. Technical assistance should be given, but it is also important to develop supporting policies to finance farmers.

The Social Forestry project which is expanding in Yen Do (Phu Luong commune) and other models for sloping land farming within the sedentarization areas are of great significance in helping farmers to choose measures of land use which suit their traditions, knowledge and ability. It is clearly necessary to consolidate and organize the forestry extension forces to deal with technical services for farmer households.

As regards the orientation for forestry land use, Bac Thai Forestry Department will improve management of the existing forest, pay more attention to protection for natural regeneration, select good and suitable species for afforestation, improve soil management in sloping land use, and apply intensive forestry by means of agro-forestry practice. All these measures will contribute to the implementation of 327 programme.

12 LAND USE AND HOUSEHOLD ECONOMY

by Dr Nguyen Quoc Hung, Economics Institute, National Centre for Social Sciences and Human Affairs

Behind concepts of the peasant household family economy there is a reality which is directly descended from traditional economic organization.

Families use the land in a great variety of ways. Different members of the family have different roles. The roles are not permanent but change over time and with negotiations and arrangements depending on the rank of relationship and the rank of power, levels of health and skills in cultivation. The division of labour is very flexible and leads to an efficient use of land. The combined labor and capacity of all members of the family, with their varying skills and capabilities leads to the general benefit of the whole family.

Where attempts are made to separate the labour of the family into generations and branches. In order to create new families with their own family economies. The separation can lead to a loss of efficiency in land use. With different conditions of capital, manpower, capacity, organisation, each new family or household will develop its own approach to cultivation, and its own range, quantity and quality, of products.

The establishment and development of new households is the basis for creating diversity in land use which is critically important in a developing market economy. Diversity leads to stability.

During 1992 - 1993: an investigation was made amongst 100 families cultivating land in Hien Luong commune. Hien Luong was chosen for the following characteristics:

- It is typical of lower slopes of the high-land area. Populated by an ethnic minority.
- Education, production and organization is average.

The following analysis aims to make a correlation between family economies and land use under current policies and market conditions.

The land area used by 100 households is 145.447 ha; the average area per household is 1.45 ha and per person is 2524.6 square metre. Of this total, the area used to grow food plants has the maximum share: milpa rice occupies 46.901 ha (33.25%) water rice gets 11.3 ha (7.77%); maize: 21.02 ha (14.45%) manioc and edible canna: 29.02 ha (19,95%). The forest area provided to families remains small: 1.75 ha (11.76%), and family garden is 12.1 ha (8.32%).

Land which has not been put in use or which is used as cattle fields takes more than 8 ha (5.50%). Hien Luong gives priorities to production of food plants in the area of 108.24 ha, which takes 74,4% of the total area. With the most important areas milpa rice (32.25%) and edible canna, manioc (19.95%), maize (14.45%).

Until now, the standard of milpa rice has been of the highest grade. Milpa rice is produced in Hien Luong primarily for local consumption. However, with an approximate average area of only 814 square metres per person (or 4700m2 per family), the income from producing milpa rice yields only about 8.5% of total income [The maximum income is of Ngu quarter (12.2%), and the minimum is of Mai quarter (7%)].

Therefore ensuring that there is adequate food for consumption in Hien Luong must include not only rice , but other crops such as maize, manioc, edible canna. Self sufficiency in food is not the only problem that Hien Luong faces. Under the evolving market economy there are two other major problems to be overcome:

Firstly the price for agricultural products in the country and in Dabac Region in particular has fallen and is extemely low. Although the production of food in Hien Luong commune is mainly for local consumption. The low price of rice has surely influenced the people of Hien Luong's toward s choosing a land use structure which increases the proportion of higher valued crops and reduces the volume of rice grown. For example, the maize area in Ngu quarter increased from 0.7 ha in 1991 to 6.47 ha in 1992 with Bioseed strain which brings an output (yield) of 6 tones per ha; growing Soya in Hien Luong reached a high efficiency thanks to new DH4 strain (900 kg per ha or about 3,150,000 dongs per ha). This has proved a good choice of production structure for Hien Luong under the current market conditions.

Secondly, the isolation of Hien Luong, introduces problems. The absence of an adequate transport stucture means that foods canot be effectively marketed. In 1992, the average price of (non-glutinous) maize (TSB2) per kilogram was 900 dong, edible canna was 320 dong, although in Hien Luong, the prices of the same products were 720 dong and 250 d respectively. In 1993, the Market price of TSB2 maize was 1200 d per kilogram and of edible canna was 300 dong per kilogram. At the same time, the price of maize was 900 dong per kilogram and the price of edible canna was only 180 dong per kilogram in Hien Luong.

The survey showed that until 1993, only 1% of the population agreed with the abolition of cooperatives, whilst 12% wished to re-organize the cooperative structure and 73% opted to maintain the current structure (other unclear and hesitant opinions amounted to 14%). It was generally agreed that a new cooperative organization is required to:

* focus on technology training to assist families to improve irrigation work (60%);
* provide credit and other services (or materials) including seed, seedlings, fertilizers, insecticides (46%);
* other opinions suggest that the role of cooperatives is only to take over certain phases of the cultivating process such as soil preparation.

Whilst the role of the commune may need rethinking, it is clear that the development of the family economy stimulates the development of production and trade generally, and liberates and mobilizes economic potential even in a poor community like Hien Luong.

13 A FARMERS' EXPERIENCE AND VIEWS FROM BAC THAI PROVINCE.

by Nguyen Van Cuong, farmer

Originally I was born (in 1935) and grew up in the Red River Delta (Nam Ha province). My native land is over-populated with very limited land resources for farming. Each household owns only 1/10 ha of land averagely. In 1965, a group of families and mine moved to Soc Son district - a Highland of Vietnam to earn the living.

When we first arrived in the new land, we were happy as land left non-use was boundless. When we found that land here is very poor, impossible for cultivation as there is much rock on the surface and low in fertility, most of the migrators were despondent. What to do? Return to the former native? That was not the way out. So, we started farming on this poor soil in the Midland.

We failed at the first rice crop, the production was only a tonne per ha. Food deficit once again happened, however, the first 6 month - government's subsidized food could not solve this food shortage, some households quitted. The second crop was better as we improved the soil by giving land lime and irrigating the rice taken from different water sources.

As is known to everybody, at that time, agriculture - cooperatives managed land collectively, but each family could own some thousand square metres of land privately. My family owned 3 s¡o (1 s¡o = 360m^2) for eassava and 5 s¡o for tea, our life was temporarily settled.

By 1980 - 1981, a new policy for agriculture production in agricultural co-operative was applied. Agricultural land was allocated to farmers in the form of land use contract as a term used in Vietnamese "khoŸn 10", the term is understood in a way that it not only brings more benefits to farmers, but encourages production to get more incomes for both farmers and nation as well. I got more land for farming. With my own experience and it is improved to be technical measure, I have been successful in my farming. Rice varieties have been replaced to get the right one that suits the soil conditions, fertilizing the right rate among the fertilizers (organic matters, chemicals, manure and even mud taken from pond bed, compost...). Besides, I had to follow the changes of the weather to have right measures to avoid disasters caused by the nature to limit losses.

How I manage my land

Garden: 1 ha of fruit trees divided into 3 parts, 1000 trees under harvesting:

- 200 Mediterranean grapefruit variety taken from President Ho Chi Minh Palace garden: 8000 pieces (12 ton) per year.
- 200 jujube (ziziphus jujuba) trees of different varieties: 3 ton per year.
- 300 custard apple trees.
- 300 trees of different species (jackfruits, apricots, plumtrees, litchi, persimmon..) 6-7 ton per year.

Total: 20 ton per year.

1 ha of tea (half of it is planted purely and the other half planted under the crown of the fruit tree). I also develop tea processing myself and the quality of my tea is highly evaluated. Each year, 20 million VND are obtained.

Fish pond: 6 ponds (1500m^2), different varieties of fish have been rearing (carp, roach, tench ...) At first, I had to buy varieties, gradually I prepare it myself. Food for fish is taken from many sources I have, certainly the family of mine can't supply enough, so I have to buy weed or vegetation leaves (6000 VND per 100kg) 5 million VND are harvested from 1,6 tone of fish every year excluding cost.

Cattle raising: Annually, 5 buffaloes, 8 pigs, some 200 chickens are raised. Last year, 500 kg pig and 600 kg chicken were sold excluding domestic use.

Afforestation: In 1967, I "furtively" planted one ha of Eucalyptus around my house. My neighbours thought badly of me, but officers from the study station of Soc Son Enterprise, Ministry of Forestry encouraged and praised me as I contributed to the greening of the open land. 6 years later, 2000 stems were harvested (D = 15-20cm). By 1975, 200 steres of firewood were sold, then I barttered wood for bricks. A big house was built. I also helped poor households (160 stems for 4 H.Hs) By now, 10 fellings have been applied, that surprised many people in my area as the coppice crops are still vigorous, certainly tending, weeding must be done but not much.

By 1982, when the government promulgated the policy of land allocation and forest protection by contract to farmers. I received 6 ha of open land, and in 1987 another 9 ha. Within 3 months, 6 ha of Eucalyptus and 3 ha of Acacia mangium were planted and by now the average diameter of those are 15-20cm. The Acacia mangium also yield high production of seeds for multiplication. 0,8 kg of Acacia mangium seed were sold. Road to access my plantation is also constructed for transportation of loggs.

The preparation of site for afforestation was too hard as we had to uptake the rock, dig the site for growing but our labour was significantly compensated. 55.000 trees for timber are growing very well in 17 ha (51.000 Eucalyptus, 2000 Acacia mangium and 2000 Acacia auriculiformis).

Planting technique: On sloping site, square holes were dug (50x50x30 cm) 3 month later, the holes would be filled with crumbly soil, and when it began to rain, planting started.

Shallow ponds were prepared close to the top of hills to store water, and the water is led little by little to channels. The terraced channels and return to the trees. When the forest is not established it is intercropped by cassava, ground nut and pine apple, then only pine-apple remains as it is shade tolerant species.

It taken time and efforts to take care of the fruit trees, tea plantation. 250 kg of mud and surface soil from rice field for a fruit tree, and the same amount of mud plus urea for a row of tea. What happens to the rice field when the surface soil taken away. I plough the remained clayey layer and fertilize 30kg of lime, 20 kg of P and 200 kg of ground nut leaf for 360m2 of rice filed to keep them fertile.

My farm is divided into 3 compartments, households of my children are located close to the plantations, each household consists of only 2-3 grown up persons, it is impossible for them to look after a large area. The only way out is to be kind and on good term with the surroundings. I fully understand the term "never enjoy all gained wealth, each for all and all for each". I'm very friendly with my villagers particularly children and always help them in difficulties.

Some figures about my incomes through years:

1988: 12 million VND
1989: 18 million VND
1990: 25 million VND
1991: 36 million VND
1992: 48 million VND
1993: 58 million VND

My family consists of 11 members (children, grandchildren) out which 5 are main labourers, 2 assistants and 4 small children. I take the case of 1993 for example, benefit gained from tea plantation is the highest, 2000 VND per m2 per year.

-	Incomes from VAC:	20 million VND
-	From tea plantation:	20 million VND
-	Rice + crops:	10 million VND
-	Forest:	8 million VND
Total		58 million VND

So, each member of the family gets 5.3 million VND averagely or 0.44 million VND per month.

And if all sources of capital is mentioned, the following figures can be seen:

-	Forest + VAC + tea...	430 million VND
-	Other sources (houses, equiments...)	124 million VND
-	Capital in other forms:	
	- National debt:	20 million VND
	- Savings:	15 million VND
	- Loan granting (without interest)	5 million VND
	- Charity:	8 million VND
Total:		602 million VND

Within some 20 years I have been praised and rewarded by the authority levels for success in profit making via gardening. Recently I was invited by FAO to attend a conference of good farmers of the Asia-Pacific in Bangkok and I was awarded a Golden Medal by FAO.

14 A MODEL FOR USING SLOPING LAND FOR HOUSEHOLD ECONOMY DEVELOPMENT IN LUONG SON DISTRICT, HOA BINH PROVINCE

by Nguyen Ngoc Trinh, Farmer

I am Nguyen Ngoc Trinh. I am 57 years old and head of a family in Tan Vinh commune, Luong Son district, Hoa Binh Province. Allow me to tell you of my experience in using sloping land for the stable and long - term development of a household economy.

1 Economic situation after 10 years cultivation of sloping land

In early 1985 my wife and I were both demobilized soldiers and retired as regulated by the State. The property of each of us at that time was only a knapsack of clothes and two laboring hands to support 4 young children.

My native place is Song Cho commune, Chau Giang district, Hai Hung Province. As there remained no land in my native commune for me to cultivate we decided to move to a hilly region of Hoa Binh province for land reclamation.

On coming to Luong Son I found no flat land was left for rice cultivation, because most of the people in the commune were of Muong ethnic minority and had been practicing water rice cultivation for generations.

In those circumstances we decided to reclaim sloping land for cultivation and livestock keeping.

2 Current situation

Thanks to industrious labour I have already now a garden and some forest. With domestic fowls with this system I am capable of earning a living for the whole family. We become better off day by day. In 1994:

- *Members of the family*: 6, which 3 are main labourers, 3 are still at school age (my elder son is serving in the army and lives far from home). All members of the family are engaged in agriculture, no involvement in trade or handicrafts.

- *Land*: we were allocated 6 ha of sloping land for gardening, forest planting and livestock keeping.

- *Benefit*: Total produce sold in 1993 was 33.1 million VND. After deduction of the expenses on fertilizers, insecticides etc. the remaining value was 28.8 million VND, all the benefits generated from 6 ha of sloping land.

- We have built a two storeyed brick house, a tea-drying kiln, a hut for poultry and have bought other facilities for cultural life including a TV set, cassette radio, and electric fan.

- Our life is generally stable. We have enough food and clothing. In 3 to 4 year time when the orchard is well established, the income should be doubled and the labour will be less arduous.

- In the past few years a number of Party and Government leaders have visited our family including the party's general Secretary Nguyen Van Linh, and the premier Vo Van Kiet. A number of international delegates also paid visits to us including comrade Cay-xon, and the the Japanese, Hungarian Czechoslovak, and Chinese delegations.

3 The family's land conditions

The total allocated land area is 6 ha. The whole area lies on the hillside, slope gradient 18° - 25°. The land has long been under slash and burn cultivation by the ethnic minority people and now there remains only a grass cover of Saccharum arundinaceum and, Imperata cylindrica The soil fertility is much reduced and maize and rice can no longer be cultivated.

Forest - orchard - livestock keeping model.

As the land is sloping, unfertile and in want of water, I decided to plant perennial deep - rooted trees such as tea, fruit trees. Vegetables are planted only for our own consumption. To conserve the soil, bands of forest trees have been planted to cover the upper slope and parts of the hill side.

Structure of the planted trees and crops

Forest: 4ha of forest have been planted on the upper slope to cover the land, the trees are mainly Acacia mangium, Albizia falcataria, Calliandra calothysus and Eucalyptus camaldulensis. After two and half years this forest belt is 5-6m and fully covers the land, checking the soil erosion, providing shade and preserving soil moisture for the tea plantation and the orchard lying below. A number of trees have been thinned for firewood in tea drying.

Orchard: An 0.5ha orchard concentrated on land less sloping and jack trees were scatter planted to provide shade for the tea. Tea is the main source of income for my family. As there are in the garden 7-8 fruit species the harvesting takes place all the year round.

Tea: (1,5ha) Tea was planted along contour lines on moderate and steep sloping land (over 20°). In the recent 6 years tea provided the most important and stable income for the family's economy. All the tea processing is done by the family itself and tea is sold processed. Tea productivity is rather high, 900-1000kg processed tea on 1.5ha.

Other subsidiary crops: Besides the area for the 3 above mentioned groups of trees, some land is left for planting cassava to feed the domestic fowls and vegetable for daily meals.

Livestock keeping: Due to lack of green feeding, pig keeping is impossible. Effort therefore is concentrated on domestic fowls (Song Cho) strain) keeping. At the age of

three months they can weigh 1.5-2.0kg each and are sold for continued keeping. Domestic fowls constitute a remakable source of income for the family.

Thanks to the rational structure of garden and forest (mainly perennial trees, protected soil) soil fertility lasts longs as compared with food crops planting.

4 Products harvested in 1993

Although many fruit trees were just bearing fruit for the first time, the yield in 1993 was as follows:

Income:

-	Tea (1.5ha) 1000kg prossed product	=	12 million VND
-	Fruit:		
	- Jujube (70 trees) 6000kg	=	8.0 million VND
	- Jack fruit (100 trees) 300 fruit	=	0.4 million VND
	- Sugar apples (50 trees)	=	2.0 million VND
	- Sapochier (33 trees)	=	1.2 million VND
	- Grape fruit (20 trees)	=	1.0 million VND
	- Kumquat (3,000®/kg)	=	0.7 million VND
	- Guava (17,000®/bag)	=	1.1 million VND
	- Livestock keeping (Dong cao fowls)	=	6.7 million VND
Total		=	33.1 million VND

Production cost:

-	Lime for soil treatment	=	0.3 million VND
-	Manure	=	1.2 million VND
-	Urea 600kg	=	1.2 million VND
-	Insecticide	=	1.0 million VND
-	Fruiting stimulant	=	0.3 million VND
-	Maize for fowls feeding	=	0.3 million VND
Total		=	4.3 million VND

(All the firewood used for tea processing and cooking estimated around 3.0 Million million VND was self - sufficent relying on branches of jujube tree, forest thinning etc... thus it is not added to the production cost)

Thus after deduction of the production cost, the effectiveness of the "forest - garden - livestock keeping system" in 1993 is:

(33.1 million VND - 4.3 million VND) = 28.8 million VND
monthly mean: 2.4 million VND for three labourer.

In addition considerable quantities of fruit were consumed in the family. With the above sum of money we; could buy all the needed food for the family, satisfy other needs and continue expanding and upgrading the orchard for the years to come.

Besides, in the two passing years we have lent money to a number of households totalling

15 million VND for house coustruction, buying cows etc... with interest rate as decided by the State Bank.

5 Conclusions

* Priority should be given to the planting of perennial trees with tap-root, avoiding the land surface to be exposed.

* Food crops (maize cassava) are planted just enough for livestock feeding where the land is less sloping. Food crops have low value and degenerate the soil due to soil erosion less sustainable.

* 40-50% of the land area must be planted with trees, forest as well as fruit trees. If the land area is large, the upper slope must be planted with forest trees to preserve soil moisture, supply firewood for tea drying and cooking meals all the year. Small branches and leaves of forest trees are used for soil mulching, preserving soil moislure under tea, soil erosion control, increasing tea yield and reducing the labour in weeding.

After 10 years labouring with 6 ha. of sloping land, I find that: if one knows to plant trees as technically required, and not to have the land uncovered the cultivation can be sustainable, ensuring a life free from want for the whole family.

Gardening brings about an income still higher than rice cultivation and in old age ones labour is less strenuous.

Thank you all seminar participants.

15 SOME RESULTS OF INTEGRATED LAND USE IN TUA CHUA DISTRICT, LAI CHAU PROVINCE

by Dr Nguyen Xuan Quat, Head of Silviculture Section, Forest Science Institute

For 2 years (1992-1993) funds have been provided by the Ministry of Technology and Environment to the Forest Science Institute of Vietnam for it to implement a technology transfer project in the Uplands and Ethnic Minorities Areas. Being implemented at Tua Chua (Lai chau), the main point of the project has been to establish an integrated farming model for the H'mong households on sloping lands. The paper shows some first results gained from the implemantation of the project, in particular from the adoption of measures related to soil and water conservation.

1 Profile of Tua Chua District

Tua Chua is a small district in the uplands, North East of Lai Chau. Tua Chua is located at the centre of the North West and bounded on three sides by rivers.

Rainfall:	1,800mm, with the rainy season occurring from May to October (92% of annual rainfall).
Temperature:	Annual average: 18.9°C, with 3 months below 15°C.
Soil parent materials:	Limestone, metamorphic rocks, shales, phyllites and sandstone.
Farm lands:	11.7% (0.26 ha/person).
Swidden field:	4.000 - 5.000 ha(1.0 - 1.2 ha/household).
Wet rice field:	930 ha (300 sp.m/person, with 1-2 croppings per year).
Total land area:	70.000 ha (17.5 ha/ household).
Forested area:	6.440 ha (1.6 ha/ household).
Denuded moutain/hillsides:	75% 0f total land area, 52.500 ha (14 ha/ household).
Yields of various crops:	Swidden (=Upland) rice: 800 kg/ha Swidden corn: 800 - 900 kg/ha Wet rice (1 cropping/year): 2,000 - 2,500 kg/ha (2 croppings/year): 3,000 - 3,500 kg/ha.
Animal husbandry:	Cattle and pigs: 2-3 head/ household.
Meat production:	170 kg/household/year.
Number of household:	4,056 (6-8 persons per household).
Ethnic groups:	70% of them are of H'Mong tribe.
Income:	218 kg equivalent paddy/person/year; with 60-70% of the household therein experiencing food shortage for 2-3 months every year.
Rate of birth:	4.5%
Educational standard:	20-30% of H.mong tribesmen and women can speak Vietnamese fluently; 60-70% of adults being illiterate.
Road network:	5 out of 11 communes having dry season access roads.

Living in the native place of many ethnic groups, of which H'mong tribes men/women

are the main ones, most of the local farmers therein are practising swidden agriculture.

2 Constraints vs Main Resources for Development

The main *constraints* are:

- steep uplands (with slopes over 80%), dissected topography, poor accessibility in particular in the rainy season.
- sparse settlements, land farming and systems being not able to meet present conditions; low educational standards.
- low incomes by households going hand in hand with difficult living conditions, poverty and nomadic style of living.
- seriously destroyed forests, frequent flash floods, eroded lands, serious shortage of water supply in particular in the dry season.
- lack of flat areas; cultivation of crops on sloping lands with slash-and-burn methods of farming and free grazing being the basic production systems therein.

Main *resources* for further development: potential to develop the following can be identified:

- better use of flats for rice cultivation, corn and bean croppings following more sedentary practices to address parts of the needs in food supply to farmers and limit the practice of shifting cultivation.
- development of animal husbandry through cattle and goat rearing using either stall feeding practices or better controlled grazing methods to increase the production of meat for domestic use and market demamds, that of farm manure for soil fertilization and the number of beasts of draught within the community.
- developing the potentials of forest products production through protection, restoration and plantation, using cash and forest tree crops such as tea, tung oil tree, threeneedle pine, host trees for lac production, and fruit trees (such as plum, apricot) to address at the same time the needs in environment conservation and those in long-term, sustained production of goods and comodities for both domestic use and market demands.

3 Outlines for Analyis and Development

Analysis following the above-mentioned improved practices should be based first on the composition of local farmers' income (or their income basket) so to secure their daily needs in food and other items of first necessity, then on the pattern of land uses, which should be appropriate for uses on sloping lands over enough large area for the households to be fully involved in land farming and in socio-economic development of the community.

A comprehensive pattern of land uses on sloping lands can comprise the following components:

Forest (R) + Swidden fields + Garden (V) + Farm lands (Ru) + Water area (Mn)
or grazing land (N) farming.

However, in the Uplands and in particular in Ethnic Minorities Areas, the whole set of components is rarely made use of. The land use pattern commonly found there only includes:

Forest (R) + Swidden field or Grazing land (N) + Garden (V)
- which should be regarded as the "core" of land uses therein.

This may provide clues to analysing and developing the economy of farmers' household, which as a rule is *linked with the local community and/or groups of households therein.*

Income basket and primary needs of a household

Based on an average H'mong household of 7 members/in 1992, and the current prices of goods and commodities/the primary needs and outlays can be estimated as follows for a household:

- starch supply: (from paddy, corn, cassava, other food): 2,520 kg/ household/ annum or 360 kg/ person/ annum, to be broken down as follows:
  - paddy: 1,000 kg/ household/a (= 143 kg/person/a): 40%
  - corn: 1,260 kg/ household/a (= 180 kg/person/a): 50%
  - cassava + others: 260 kg/ household/a (= 37 kg/person/a): 10%

- other foodstuff:
  - meat (for domestic uses): 112 kg/ household/a (=16 kg/ person/a): pig, chicken.
  - meat (for customary rites): 50 kg/ household/a (= 11 kg/ person/a): all kinds.

- other items of first necessity:
  - iodine-added salt: 42 kg
  - soup making powder, dried fish: 14 kg
  - kerosene: 5 litres
  - dry batteries for flash lamps: 5 pair
  - water supply: 8-16 cu.m.

- productive lands requirements:
  - for food production (estimates with yields amounting to 1000 kg of food per hectare):
    - paddy and corn for food: 2.520/1000 = 2.5 hectares
    - corn for animal feed: 162 x 4/1000 = 0.7 hectares

    (accounting 4 kg of grain for 1 kg of meat)
    total 3.2 hectares
  - paddy and corn seeds for cultivation and land taxes:
    - paddy: 2.5 ha x 60 kg/1000 = 0.15 hectares
    - corn: 0.7 ha x 13 kg/1000 = 0.01 hectares
    - taxes: 2 adult labourers x 60 kg/1000 = 0.12 hectares

    total 0.28 hectares

Total sloping land area needed to meet various requirements as mentioned above amounts to: ha 3.2 + 0.3 = 3.5 ha/household.

Outlays and potential sources of incomes:

- outlays for items of first necessity (in d«ngs):
  - iodine-added salt: dong 700 x 42 = Dong 29.400
  - kerosene: dong 3.000 x 5 = Dong 15.000
  - powder for soup: dong 2.000 x 14 = Dong 28.000
  - dry batteries: dong 3.000 x 5 = Dong 15.000
  - cloth: dong 3.000 x 60m = Dong 180.000
  - others: = Dong 100.000

  Total = Dong 367.400

- main incomes:
  - sales of piglets: dong 10.000 x 10 kg x 2 head = Dong 300.000
  - sales of pork: dong 5.000 x 60 kg x 1 head = Dong 300.000
  - sales of chicken: dong 8.000 x 1.5 kg x 5 birds = Dong 60.000
  - sales of vegetables: dong 20.000 x 10 kg = Dong 20.000

Under these conditions, to meet primary food requirements and needs, each household will need access to:
- 3.5 hectares of sloping lands for food/feed production;
- a regular inflow of incomes amounting at least to dong 400.000 which must be obtained mainly from cattle and pig rearing.

This is to show that the income basket of local farmers and their sloping land use/farming patterns are closely related.

4 State of land uses by local farmers' households

Results of interviews and direct observations show 3 types of sloping land uses that are closely linked with 3 types of households as described below:

- Households having their houses surrounded by small gardens, but their " fixed swidden fields" are located far from houses. These are households of *traditional swiddeners* living in the district for more than 30-40 years and accounting for 75% of the total.

- Households having their houses built up next to their gardens and "fixed swidden fields" both/of larger area but farmed with extensive methods; they are households of pioneer swiddeners, that have been separated from their families since 5-10 years, and that account for 15% of the total.

- Households having new farms or "simple" houses and enough land for gardening and swiddening, but practising only extensive shifting cultivation; these are households of junior pioneer swiddeners that have been newly separated from their old families, and that account for 10% of the total.

The state of land uses and time/the/ households being separated from older ones also translate the process of development of shifting cultivation as it is being practised in the Uplands. This is the effect of an lod-time customary law allowing access to land through the expansion of a more "sedentary shifting cultivation" practice. The state of thing and its process can be described by the following diagram.

Households of traditional swiddeners (living in the area for 40-50 yeras)	Households of pioneeer swiddeners (having separate land holdings for 5-10 years)	Households of junior pioneer swiddeners (newly separated from older families)
House + Small garden +_ Far-away *swidden field*	House + larger gaden + *nearer swidden field*	Farm + garden + *swidden field being newly* established.

Thus, to help local farmers have enough income to lead an acceptable life, and to halt the process of forest destruction through spreading shifting cultivation, it is necessary to pay more attention to the pattern of land uses and the adoption of appropriate farming systems by various households on lands and forests allocated to them as stipulated by laws for sustainable production.

5 Allocation of lands and forests to local farmers

The state of natural forests in the district, as mentioned earlier, is quite abnormal, with forested area amounting to only 1.6 hectare/ household, while denuded mountain-and hill-sides are extending over large tracts of land (14 ha/ household). It is not easy to allocate these denuded areas under the conditions of the Uplands. The allocation to farmers should be started with that of existing natural forests - including newly regenerated fallows - which are to be maintained, and the resources of which are to be developed as forests are very precious in the area for farm crops protection and the conservation of watersheds for water supply to villages.

As these forested areas are very small but very important for socio-economic development and environmental conservation, the allocation has to be made following the below mentioned principles:

* Forested areas next to local farmers' households are to be allocated to farmers living therein for them to develop integrated farming systems and for better protection/management.

* Forested areas of limited acreage but of vital importance for watershed conservation are to be allocated to groups of 2-3 households to secure the principle of equity and for the group to take responsibilities in protection/management following the traditions in the area.

The same principles are to be adopted to fallows now being regenerated, thus empowering local farmers to manage these lands by themselves.

Swidden fields also are not extensive (1-I.2 ha/household) but are of vital importance to households as they are their main and only resources to live on. But swidden swidden fields have been developed piecemeal and scattered over large extent of land; they are, on the other hand, considered as the property of farmers that have cleared the lands and developed the farming thereon following the customary law. Due to this allocation of swidden fields is to be made following the "preemptive" rights of local by laws to be followed by gradual land transfer adjustments through persuasion of and negotiations between farmers. At the same time, special attention is to be give to the fact that the smallest area to be allocated should not be less than 3.5 hectares for a household of 7 menbers to live with the land through improved land farming, using better seeds and technology to increase the current yields of various crops. However, under the present seting, land allocation by it self is not everthing. Other assistance is also badly needed .

For gardens, the allocation is much easier because of their smaller area (400-500 sq.m - 1000-2000 sq.m/ household) and their loacation next to farmers'houses. Allocation is to be made simply based on land already developed by individual households for that purpose. The main point here is to introduce better practices of gardening and animal husbandry so to provide conditions for each family not only to secure their subsistence life but also to produce marketable commodities for sales.

Based upon the above, 200 hectare of natural forests have been allocated to 60 households (3-4ha/household) for longterm maintenance/protection; 150 hectares of swidden fields and lands having potentials to be developed into swidden fields have been allocated to 50 households (3.7 ha/ household); and nearly 10 hectares of garden have been allocated to 97 households in the two (2) villages of Phi_ng bung (M_êng B¸ng commune) and of T_ La C¸o (Xinh Ph_nh commune). That first stage of land allocation with special reference to the traditional land use pattern of the area has created conditions for sustained production therein and further transfer of technology to farmers.

6 Transfer of Technology and Adoption of Advanced Techniques

Forestry: Extension workers have helped local farmers establish boundaries between plots for forest protection and management by the farmers themselves, plant Amomum spp. Under the canopy of degraded forests and fill the gaps with seedlings of Chukrasia tabularis, Toona spp., Acacia mangium... in patches mainly in newly regenerated fallows (6 households on 10 ha).

Households have also carried out multipurpose trees planting using Tephrosia Candida, Leucaena glauca and other tree species to create alleys/quick hedges for protection of home gardens, soil conservation and fuelwood production.

Swidden agriculture: Households have begun to use new cultivars, in particular the corn cultivars known as Q2 and TSB2, on rice terraces and gentle slopes not under cultivation during the Spring/Autumn crops, to increase both corn production (by 2-4 times more) and the number of corn crops (/2-3 croppings) per year. The local rice variety has been replaced by a new cultivar from Thailand and the rice production has been increased by 2-3 times (50 households on 50 ha).

Local farmers have been encouraged to gradually build up terraces for the cultivation of cash crops such as tea, coffee, using Acacia magium, Leucaena glauca, Tephrosia candida as cover crops or/Tung oil trees mixropped with Tephrosia candida for soil conservation, better soil water retention and soil improvement (5 households on 2 ha).

Alley cropping of upland rice and corn practised on contour lines and using Tephrosia candida planted at distances of 20-30m on slopes has been developing in the area for run-off control, soil and water conservation to promote the adoption of more sedentary land farming systems on sloping lands (10 households on 20 ha).

Home gardens: The older gardens have been improved following the principle of alley cropping, using quick hedges to protect fruit trees including varieties of plum such as Men Heu, Men Tam Hoa, those of apricot from Yunnan, and of mango from Yen Cheu, grown with tea or coffee (70 households on 5 ha).

The so called junior pioneer swiddeners having their newly established home gardens extending over larger area of 2000-3000sq.m have started the cultivation of long term fruit and cash crops most suitable to the ecological conditions of the area and grown with beans and legumes such as Mung bean (SX 03) and Tephrosia candida or following alley cropping in rows (12 households on 3 ha).

Parallel with the above transfer of technology on how to carry integrated farming on sloping lands following the traditional cropping pattern, other relevant measures have been introduced and promoted in the area.

- Establishment of man-made forests for both production and protection on denuded mountain - and hill sides; planting scattered tress at hospitals, scholls, offices...with such tree species as: Chukrasia tabularis, Toona spp, Pinus massoniana, sandal wood, Cinnamomum camphora, Acacia mangium, Schima spp... (nearly 70000 plants during 2 years).

- Improvement of degraded tea plantation, using for this Tephrosia candida as cover; establishment of new tea plantations, in which Tung oil trees and legumes are used as cover crops and terraces gradually built up.

- Construction of ducts for water supply and of water tanks for groups of 2-5 households (10 water tanks for 10 groups of households in 5 villages), and that of village household communication systems (in 2 villages).

The above activities for the welfare of local farmers and their communities were supported by a wide range of technical assistance provided through the following Projects:

7 Support to the transfer of technology and adoption of new techniques

Side salary amounting to dongs 50000 - 300000 per month provided to officers/workers working either at central or local agencies, based on results gained (in directing the work or carrying out introduction of new technology in the Area), and on the time worked

(months/years).

Establishment after 2 years of work of a demonstration area, in which an integrated "forest - swidden - garden" system production is adopted on 3.5 hectares of sloping land on loan from the District (the land being now returned to the District authorities for use as demonstration areas), to show pioneer swiddeners how to farm in the area. The demonstration area comprises: 2 hectares of regenerated fallow being improved with further plantation of indigenous forest tree species such as Chukrasia tabularis, Toona spp., Schima spp.; 1 hectare of "fixed swidden field" in which more sedentary shifting practices have been used: 9a) slopes planted with corn cultivars Q2 and TSB2 in Spring/Autum foloowing alley cropping on contour lines and using Tephrosia candida for soil erosion control, and (b) on gradually created terraces (at foot of hill), 3 crops per year (rice in Spring - Summer; corn cultuivars Q2/TSB2 in Summer -autumm; and corn cultivar Q2 in Autumm - Winter) have been effected; and 0.5 hectares of garden being farmed following the current VAC system with the cultivation of all kinds of fruit crop: plum, apricot... mixropped with tea, Tung oil trees, mung bean (DX03) and with Tephrosa candida, Cajanus cajan, Acacia mangium, Leucaena glauca... to provide shading and cover protection for other crops and enhance fuelwood production, all this parallel with development of pig and poultry rearing and that of fish culture and Azolla cultivation in ponds and on their surface.

In fact, the demonstration area attracted the attention of more than 26 delegations of visitors coming from within and without the province and thousands of local farmers interested in the farming system as a whole.

Assistance in terms of improved seeds, breeds and technical supplies with /without repayments:

- Repayments in kind are requested for all items of assistance that can help farmers obtain annual incomes, the amount being equal to what has been given at the beginning as assistance - except for very poor households and those encountering restraints and having not enough resources to proceed on - so to provide the Project with some more resources for extension of new technology to other households in the area; (payments being also requested for rice husking services so to pay the workers employed for that purpose and parts of the costs of fuel used and of machinery repair).

- Repayment in kind is not requested for all other crops/animals that can yield incomes only after long periods of waiting and for technical supplies such as forest tree seeds and seedlings, fertilizers, insecticides so to encourage the adoption of new technology by farmers.

For 2 years, the Project has provided 1970 kg of corn (Q2, TSB2 and PII cultivars) 72 times to households for corn cultivation on 45 hectares of swidden field, 920 kg of rice from a Thailandese cultivar and a Chinese hybrid 15 times to households for cultivation on 17 hectares of swidden field, 2500 kg of Tephrosia candida seeds to 13 households for alley cropping, 3500 seedlings/cuttings of fruit tree to 30 households for improved gardening on 1O hectares. Repayments in kind of corn and rice by local farmers

amounted to 2500 kg, most of these were used to help other intereted farmres who began to grow new cultivars of rice and corn/those and/who could not crop in good harvest due to a lack of close monitoring by Project staff.

Assistance to improve the educational standard and the technical knowledge of local people has been given through informal training during extension, through on - farm training, training workshops, case studies and field visits. Ten(1O) local officers, 50 household heads and "village" technicians in 2 villages involved in the Project have got good knowledge/experience on how to extend the new techniques. Fifteen (15) managers and instructors of the district have got enough experience on how to direct rural development in the area as conceivad above. Three(3) training workshops were held by local Forest - Agriculture Extension Agencies to train over 200 local technicians and farmers. Three (3) study tours/field visits were organized for 16 officers/managers working at district, commune and village levels to see the results of sloping land farming at 1O districts in other provinces of North Vietnam.

8 Summing-up and conclusion

Tua Chua district is quite specific with its location in the back Uplands of Lai Ch©u province, and of the North West. 70% of local farmers are of H'mong practising shifting cultivation on lands, 85% of which are sloping, in an area having only 1O% forest cover, very poor transport facilities, constraints to water supply, low local people's educational standard and a high rate of poor households (60% of the total).

Improving land farming, using more sedentary and intensive methods, better controlled cattle grazing in combination with forest resource development based on the traditional "forest - swidden - garden" cropping pattern seems to be best to remove the present constraints for the consolidattion and development of Uplanders'household economy.

The transfer of technology and the extension of new techniques made following the above mentioned guidelines and being actively supported by a wide range of appropriate and effective technical measures during these last 2 years (1992 and 1993) have been eagerly received by local farmens' households and communities and have brought in good success, the impacts of which are to be studied with care. They are creating prerequisites for sustainable sloping land use and development.

Not taking into account other direct/indirect benefits which may be neglected in this report or which are difficult to assess, the system, as practised on 3.5 hectares of sloping land with new cultivars and more sedentary methods introduced, has provided over 7000 kg of food/household/a (the estimate being made based on the lowest yields of the crops used), affording a food supply much higher than the one needed estimated at 2500 kg/household as mentioned earlier when trying to find out appropriate land use systems to meet the minimal requirement in food of local farmers. The exercise though not very complicated has in fact helped local farmers remove the vicious circle of poverty, under - developed economy and environment destruction.

16 SHIFTING CULTIVATION IN VIETNAM

by Dr Do Dinh Sam, Vice Director, Forest Science Institute

Shifting agricuture is a traditional land-use system of the ethnic minorities in Vietnam and many other coutries in Asia, America and Africa. There is a common belief that this practice deteriorates the environment. In particular, forest destruction causes serious soil degradation and erosion. Many researchers in various countries consider the problem of shifting cultivation more carefully and objectively, seeing in it valuable aspects that can contribute to sustainability. Careful consideration of this problem in Vietnam is needed to determine appropriate policies and measures. Analyzing the problem is not entirely simple because shifting agriculture in the present stage of our country is under the increasing pressure of population growth, the environment being seriously damaged by many causes,

We must however try to approach the problem in an objective manner.

It is necessary first of all to differentiate the types of shifting agriculture. The following main types of shifting agriculture exist:

- The *pioneer* or non-cyclical system. That is the type of slash-and-burn cultivation that exhausts soil fertility. Due to seriously decreased crops productivity or the labour spent on weeding is too high compared with the value of the harvest resulting from repeated cultivation, the people leave the land for ever and the entire hamlet moves to another place.

- The *rotational* system. In this system the slash-and-burn cultivated plot will lie fallow for a period of time some years of cultivation (the soil is not exhausted). After the following period the land is used again.

Besides these, in Vietnam there is *supplementary* shifting cultivation, this type is usually found on steep slopes surrounding valleys. The people are short of water-rice fields and must resort to slash-and-burn plots.

The researchers all admit that the pioneer shifting cultivation system destroys the environment drastically and especially causes soil degradation and hinders forest rehabilitation. Rotational shifting cultivation system is relatively sustainable, and does not seriously destroy the environment. This system is moreover considered as a wise use of a rather fragile system of tropical forest and forest soil. What is like these two types of shifting cultivation in Vietnam?

Through a series of surveys and studies and literature references we come to the analysis as follows:

- It is similar to Thailand and Laos, pioneer shifting cultivation system is mainly pratised in the uplands (North West), elevation $>1{,}000$m by H'Mong ethnic group. A number of H'Mong hamlets (Khau vai, Sinh ho, Xin phinh) have resettled many times. For example two hamlets Ta la cao (Xin phinh) and Phuong

bung (Muong bang) in Tua chua district (Lai chau province) have just settled there for 50-60 years after moving from Ta xich Thay and Trung thu, 20-30 km far from there. Now both the two hamlest already practise shifting cultivation at a place 10-15 km far away, erecting temporary lodging huts. The H'Mong people in Paco, Hang kia in Mai chau district, Hoa binh province are more conscious, leave over the part of forest on the hill top for moisture maintaining and soil erosion control when practising slash - and - burn cultivation. They however still practise pioneer shifting cultivation system, 50-70 km far from hamlets. Pioneer shifting cultivation system is now no longer typical with the H'Mong group. It is also practised by other ethnic groups such as Dao, Tay. Van kieu and as the area of forests nearby is not sufficient for slash - and - burn cultivation they must do it at the places far from their hamlets.

- The rotational shifting cultivation system practised by most of the remaining ethnic groups such as Dao, Bana, E-de, Gie trieng... Looking for typical areas of this cultivation system is now not entirely easy (people intently cultivate only one or two crops, seeing to forest rehabilitation for next cultivation cycle and are conscious of maintaining forests, avoiding careless destruction of forests). There can be mentioned a number of areas representing this system of shifting cultivation: The Van kieu people (Quang ninh district, Quang binh province) raise 1 or 2 crops of hill rice or maize then leave the land fallow for 5-7 or 10 years before cultivating the land again.

They are aware of maintaining the forests to preserve the moisture and the environment and only cultivate the old slash-and-burn plots when these are recovered, no further forest clearing is done. Or the Bana, E-de people (Central highland) people, each hamlets has its definite area, rotational shifting cultivation is practised but the forest clearing is done as regulated within the limits of the hamlets. No careless forest clearing is done on the land belonging to another hamlets. According to synthesized survey data concerning Dao people in Bac thai, Quang ninh; Bana people in the Central highland; Van kieu in Quang ninh, the average cropping period is 2-3 years up to years where the soil is good. The fallow period is usually 5-10 years. At present however due to population pressure and the shrinking back of the land for slash - and - burn cultivation, the cropping period is prolonged to the time when the productivity is too low and the fallow period is shortened (4-5 years, or 2-3 at some places). *Thus it can be said that in practice the rotational shifting agriculture in our country has gradually shifted into pioneer agriculture. That is a very important fact that must be kept in mind the present reality.*

The problem is that we must analyze to see whether the rotational shifting cultivation systemm in Vietnam is sustanable or not, sustainable to what extent in economic, environmental and social aspects. To make the analysis we first of all determine on the criteria for the evaluation. As to us the criteria to be based upon are:

As regards economics:

- Food security, ratios of the sources of income in the life of the households at present and in the future.
- Comparing the value of the woody mass in slash - and - burn practice to that of the food obtained.

- Possibility of long-term and stable development.

As regards environment:
- In macro scale attention must be paid to the effect of slash-and-burn cultivation on the ratio of forest loss caused by it.
- In micro scale: consideration is made of the possibility of forest rehabilitation after slash-and-burn cultivation and the natural forest succession process; the change of soil fertility in slash-and-burn cultivation.

As regards social aspect:
- Attention is paid to 2 factors: traditional cultivation practice and the ethnic traditional culture.

In economic aspect it can be generally seen that the ethnic people live on shifting cultivation are mostly poor. Ba che district, Quang ninh province for example is considered to be the poorest district of the province. Most of the people here belong to the Dao ethnic group and practice shifting cultivation. The Don dac village has 737 households (average 6.2 persons/household) of which 286 households are permanently short of food (representing 39%), 372 households are short of food for 3-6 months a year (representing 50%) the remaining 79 hoseholds are short of food for 1-2 months a year. The Dao people of Khuoi Sao hamlets (Tan lap village, Cho Don district, Bac thai province) live totally on slash - and - burn cultivation. 20% are short of food for 3-6 momths/year. The Bana ethnic people in Takor, Sapay village, Gia lai province have 74.5% of their income from hill rice while the average income of the whole village is only 10-12 kg of husked rice capita per month.

According to the statistics of the Ministry of Labour, War Invalids and Social Affairs, in rural areas, the households with average income of $<= 8$kg husked rice/capita/month are categorized as hunger, 15kg husked rice/capita/month as poor. Thus in the mountainous regions of North Vietnam the hunger and poor households represent 20-30% and 40-60% respectively. It is obvious that although in recent years in Vietnam there has been a surplus of food (rice), some amount has been exported, but in mountainous regions the food sources relied on slash-and-burn cultivation (representing 75-80% of the income) are insufficient, let alone other expenses the people must pay.

Although there remain till now different opinions concerning the quantitative index on the evaluation of poverty degrees in the rural areas but one thing generally definite in that the majority of the ethnic minority people in the mountainous regions, practising shifting agriculture are still ranked as poor and hungry in our country.

Comparing the value of wood and forest products destroyed by the people in slash-and-burn cultivation with that of the food obtained on the same area, it is clear without calculation that the great value of wood and forest products is brought to naught.

For example the average volume of forest in high plateau of South Vietnam, where slash-and-burn is practiced, is about 250-300 m^3/ha, in which there are many species with high economic Value: Pterocarpus pedatus, Chukrasia tabularis, Paramichelia braianensis, Michelia hypolampra, Aglaia gigantea, Canarium bengalensis and so forth.

The aspect that deserves most attention is the effect on environment. Researchers, especially those participating in the Tropical Forestry Action Plan hold that one should not over estimate the damage caused by shifting agriculture to the environment and put all the blame on this land-use system.

Let us try first to analyze the relation between shifting agriculture and the loss of forests. A great difficulty remaining is that one can not discern in the deforested erea made known by statistics how much is caused by shifting agriculture and how much is caused by other activities and events (exploitation, forest fire, careless forest cutting for trade and utilization purposes).

Thus the analysis made here is much of an orientation nature. Take the North West region for example (Table 1).

Table 1: Relation between slash-and-burn cultivation expansion and the forest cover in the North West (1965-1985). (According to Bïi Quang To¸n, 1991).

Whole North West region and its provinces	Population (1,000 persons)		Slash-and-burn area (1,000 ha)		Income from Slash-and-burn cultivation (% of total income)		Forest cover (%)	
	1965	1985	1965	1985	1965	1985	1965	1985
Whole NW region	878	2,048	227.1	381.6	76.9	77.1	20.9	10.6
Lai chau Prov	187	421	49.2	86.0	76.6	75.2	18.6	7.5
Son la Prov	269	632	71.0	19.4	73.3	75.7	17.5	9.0
Fommer Hoang Lien Son	422	995	106.9	176.2	81.0	80.5	26.6	15.5

Within 20 year (1965-1985) forest cover decreased from 20.9% to 10.6%, especially Lai chau - from 18.6%. Thus the forest cover in Lai chau decreased by 11.1% in 20 years. The increase in slash-and-burn area was 37,000 ha equivalent to a cover of 2.2% - the cover decreased 2.2%. Similarity is found Son la: (Natural area 1,42,999 ha) forest cover decreased 8.5%, slash-and-burn area increased 48,000 ha equivalent to the cover of 3.3% and Hoang Lien Son (Natural area 1,486,520 ha):11,1% decrease in forest cover, 70,000 ha increase in slash-and-burn area equivalent to the cover of 4,7%. From the above data it can be found that the deforested area due to slash - and - burn cultivation represents 20-40% of the total defrested area, the average ratio for the whole North - West region is 30%. It means that in this region in 20 years the deforested erea due to slash -and - burn cultivation accounts for 1/3 of the tatal deforested area.

A number of recent studies in the project of social forestry development in Da River are also remarkable: at least shifting cultivation is not the only cause of deforestation (NguyÔn Duy Khi_m and Paul Van Der Poel, 1993).

We can consider further the Central Highlands where the forest cover is highest now in the whole country (60%). The forest cover in 1975 was still much higher. The ethnic minorities in the Central Highlands have been living there for many generations practising mainly rotational shifting cultivation. Thus there is good ground to believe that cultivation system had not brought about drastic deforestation for a century in the past.

In brief, rotational shifting agriculture in general does not cause drastic deforestation as expected. It is now however due to many causes (too much population growth, insufficient land for slash and burn cultivation, fallow period is too short, land - use is gradually shifted to other purposes such as enclosures for natural forest succession, forest planting, orchards; mass and unorganized population resettlement etc. ..) that *there are many manifestations of expansion of pioneer shifting agriculture, causing more obvious detrimental effects to the environment.* Some additional latest data can be mentioned: in November 1992 the Tay and Dao ethnic people in Dinh lap (Lang Son province) and Ba-che (Quang Ninh) respectively migrated to Dac Lac. 29 households of the Dao ethnic group have cleared 65 ha. Of rich forests for slash-and-burn cultivation. In the whole Krong - no district upto 175 ha of forests were destroyed in the first four months of 1993 for slash-and-burn cultivation.

Relating to the environment is the modification of soil fertility in the slash-and-burn cultivation process. Researchers in various countries are also of the opinion that the soil degradation and erosion in rotational shifting cultivation is not serious because in the fallow period the forest is gradually restored. Some research authors (Arnason et al 1982) moreover have their remarks that the phosphorus amount remains the same after the three-fear fallow. Main problem is that much labour must be spent on weeding if cultivation is made. In Vietnam, in a number of conditions such remarks of an orientation nature can be admitted through field obsevation. The evedence is that on many good soil areas (specially basalt) where the topography is not very steep, there remains in the surrounding more or less adequate forest cover and long fallow period (7-10 year mr more) is adopted, The People caj do the cultivation for many generations. It means that the soil fertility does diminish but it is gradually restored. However those areas are not many. Usually the people abandon the land for ever after 2-3 cultivation cycles. on this matter we would like to express a number of our main view points based on the studies that have been made previously and recently:

- The potential fertility of tropical forest soil is not high. The nutrient sources contained in the biomass within soil is not great. The more the soil is satisfactorily covered the better its fertility is maintained and conserved. Thus any impacts imposed on tropical forests gradually remove the vegetation cover or substitute it with a cover of simple or non-woody composition will results in reduced soil fertility.

- The burning in slash-and-burn cultivation is much beneficial to the cultivaters: reducing labour in land preparation, reducing soil acidity, increasing ash and nutrient contents, promoting regeneration of a number of forest species etc...

  However the nutrients released in the burning process are leached away quickly. Repeated burnings harden the soil and impair the surface soil layer. A number of elements (P,S) are lost during the burning process.

- In the changing process of soil fertility in slash-and-burn cultivation, the physical properties of the soil are obviously ill - effected especially porosity, moisture, soil structure of the surface soil layer (usually 30 cm deep). This is also the very soil layer where the roots of agricultural plants are most distributed. *As, regards soil*

chemical properties, most prominent is the reduction in humus content, calcium and exchangeable magnesium especially soluble phosphorus-and phosphorus is closely related to rice (grain) productivity (Table 2).

- Effect on soil erosion is most interesting. It is not yet mentioned here the absolute soil loss per ha/year in the experimental formulae but the studies all show that in the same conditions, hill rice and cassave cropping causes greatest soil erosion as compared with other planted crops: tea, groundnut, beans, coffee... or bush vegetation. For example hill rice in the Central Highlands on basalt soil causes soil erosion of 130 tons/ha/year (NguyÔn ThÕ Mü, 1964) cassava on 25° steep slope on mica-schist causes soil arosion of 1,64 ton/ha/year, but dense brushes cause soil erosion of only, 0,60 ton/ha/year (Bïi Danh M«, 1986)

There is here however an agreement that it had - better not to extrapolate from absolute data from annual observation on a definite experimental formula to the soil erosion rate in the whole process of slash-and-burn cultivation. That extrapolation is not accurate because the restoration process of the vegetation plays an important role in soil erosion control. Thus it is better also not to hurry in stating that shifting agriculture generally causes serious soil erosion.

On the possibility of restoring a vegetation cover after slash-and-burn cultivation. This is true and has been proved by many studies and real evidence needless of further discussion and analysis. Depending on definite conditions and situation in each area the restoration process of the vegetation cover after slash-and-burn cultivation might be the formation of different vegetation types from grasses, bushes, bamboos to woody species. For example in Muong la, Son la prov. After 10 year secondary forest reappeared with the upper layer of Quercus sp and Fagasceae sp on the shrubland caused by shifting agriculture.

Social aspect: In social aspect slash-and-burn cultivation can be seen as a traditional cultivation system, associated with the people from generation to generation. Slash and burn cultivation can be seen as age old outcome of history, partly linked with the spiritual life of a number of ethnic minorities. For example, with the ethnic minorities in the central hightland the rice harvesting time (from slash-and-burn areas is) Joyful as a festival in the community. People have the custom of making offering and worship before bringing in the crops and many places there is a habit of making ceremory to welcome the rice from the field. Those are part of the spiritual life of the community. That's why the changes in their cultivation habits are not entirely easy.

Looking at shifting agriculture we had better also see in it definite strong points. There are two main features: That is the rotational system in land use. The true nature of this land use system by the people is this maintenace of the soil fertility for long-term cultivation, alternation of cultivation with following, creating conditions for the formation of the vegetation cover. If the fallow period is long enough to allow the restoration of soil fertility then basically the land use system can be relatively sustainable and stable. In addition the people do apply agroforestry system, mixed and overlapped cropping.

In brief, from all the analyses above we should evaluate the problem of shifting agriculture more objectvely and ascertain correctly its effects on the environment.

Another fact that should be paid attention to is: In the present situation in Vietnam as already analyzed above (population pressure, much of the natural forests are destroyed, insufficient land for slash-and-burn cultivation....) the trend of pioneer shifting agricultural system does grow (more exhausted land use, shorter fallowing period and going farther from the hamlet for slash-and-burn cultivation). It is due to that very trend together with the drastic decrease of forest area now that the negative effects of shifting agriculture express themselves more clearly.

Besides, relying only on shifting agriculture the people's life is poor. Together with high population growth rate (average 7-9 children per household) the people's life can not be assured normal.

That is why we have proceeded with the fixed cultivation and sedentarzation for many years now and many changes have taken place in the people's life with about 30% of the shifting cultivation people adopting fixed cultivation have rather stable life through enlargement of water - rice area, husbandry, promoting industrial crops, fruit trees and/or forest species with high economic value (Cinnamomum cassia, Illicium verum). We have also determined the orientation in solving the food problem for the people by several ways, not only by production of food on the spot. Food production in the whole country now increases a lot with some extra amout for export.

The change of farming method of shifting agriculture plays an important role in the fixed cultivation and sedentarization. Water rice yield reaches 3-6 tons per annum that is 3 times more than the dy rice. In central high plateau the target of 2.5 tons of cafe per household becomes reachable. Inhusive maize plantation produces the yield 6 tons/ha 3 times higher comprared with the previous one.

In some regions the ethnic minorities have involved into state agricultural and forest enterprises. This forest enterprises of Easup (daclac prov.), Rubber and coffee plantation of Daclac, Gialai, Kontum prov. have been sucessfull in involving local people into enterprises activities.

Application of agroforestry systems is important /measure for the intensification of shifting cultivation. Agroforestry model with high-value economic specie Cinnamomum Cassia is successful applied, especially by Dao ethnic group in North Vietnam and Co ethnic group in Centre Vietnam (Quangnam - Danang, Quang Ngai prov.). Cinnamomum bark is exported to many countries and wood can be sawn for furniture although it doesn' have fine veins.

Main agro-forestry modes with Cinnamomum Cassia are following:

1. Cinnamomum Cassia is planted in different time under the Canopy of natural forests, 0,5-0,7 coverage with high density 2,000-3,000 trees/ha. When Cinnamomum Cassia is 3-5 years old, to meet its light requirement, some woody trees of natural forest must be bark - girled to death. Finally there will be Cinamomum Cassia forests, uneven - aged, mixed with tiber species. At about 10 years of age C. Cassia can be selectively thinned and have their bark harvested. At 20-25 years, C. Cassia reaches the height of 20m, diameter: 30-35c,. The ethnic

minorities have the practice of planting shade-tolerant, big pineapple Anana sativa under Cinamon forest.

2. C. Cassia + dry rice or cassava model, dry rice or cassava does not only give its products but also plays an important role as shade providing for C. Cassia in young stage. Planting desity is is high, 7,000 - 10,000 trees/ha. Food crops are no longer mixed planted when C. Cassia forest is 4-5 years old.

Establishing C.Cassia forests the Dao ethnic group, have the opportunity to carry out intensive management of their water - rice fields below. C. cassia forest in Vietson (Yenbai prov.) at 30-35 years old - each tree yields 30kg of dry bark. In Quangnam - Danang prov. a tree with D = 23cm, H=13m yields 23kg of dry bark; D=27cm, H=14 yields 50kg. Rice mixed planted can have the productivity of 1.5-2T/ha crop and Cassava 8T/ha/crop. Water rice productivity is 5T/ha/year.

In another model in Quanhoa (Thanhhoa), the ethnic minority people plant bamboo "Dendrocalamus membranaceus" to have its shoots for export.

However, the number of people having stable life with fixed cultivation is not great. Even in some regions where the fixed cultivation is considered good the conditions are favourable for economic development our survey shows that majority of the people are still practising shifting agriculture, especially of the pioneer type. Inregions where difficulties are still met with, the conditions for enlargement of water - rice area are unfavourable, the topography is rugged, coomunication is incovenient then shifting great problem with the people in the mountainous regions especially the high mountain areas.

In all the fixed cultivation and sedentarization alternatives in many provinces, shifting agriculture problem was not conceived as it really meant. May in the concrete conditions of the region, the locality this problem be reexamined in a more business - like way so that rational approach can be found out. May it necessitabe the remaining of shifting agriculture in a positive direction i.e ensurring the cycling of forest and slash - and burn cultivaton on definite areas. We need also quickly to carry out research on establishing on these areas shifting cultivation mode that are effective in both soil conservation and generation of income for the people.

Depending on the conditions and situation there must be differentiated 3 areas in relation to shifting agriculture: The area where shifting agriculture must be replaced by other land use alternatives (in the immediate time, those are upstream areas, special used forests areas where condition allow development of commodity economy); the area where shifting agriculture must be replaced step by step (there exist both rotational shifting agriculture and other land use alternatives); the area where shifting agriculture might be allowed to some extent without causing adverse effects to the environment. Such a classification helps us concentrate our invested fund to the critical areas where the problem of replacing shifting agriculture must be solved.

Table 2: Changes of soil fertility in slash-and-burn cultivation (Yellowish-red feralit)

Profile	Depth (cm)	Clay (<0.001 mm)	Water pH	Humus (%)	N (%)	Exchangeable acidity Al^{+3}+ H^{+1}		Hydrolytic acidity (Miliequivalent/100g)	$Ca^{+2}+\frac{1}{2}Mg^{+}$ (mg/100g) equivalent	Soluble P2O5 (mg/100g
1st hill-rice crop after slash and burn	0-10	13.2	4.9	5.5	0.23	2.3	0.04	12.8	3.7	5.0
Cassava crop after several successive ones	0-10	10.8	5.6	3.8	0.17	0.4	0.04	6.3	4.2	1.2
Maize, two years after forest clearing	0-10	14.0	5.9	4.1	0.22	0.2	0.04	5.9	8.0	3.1
Maize, four years after forest clearing	0-10	19.6	6.1	4.2	0.21	0.1	0.04	4.4	10.5	0.8
Grasses, 7th year of the fallowing period	0-10	21.6	4.1	4.9	0.40	2.1	0.04	10.3	0.8	0.6
Secondary forest after slash-and-burn cultivation	0-10	21.6	4.8	6.2	0.24	2.2	0.06	14.0	2.7	1.5

Table 3: Structure of income per capita in Takor hamlet (Gia lai pro.) in 1991 (According to Vu Long, 1992)

Souces of income	Income (1.000 d)	Ratio %
Rice	203,0	74.5
Green bean	26,2	9.6
Maize	12,8	4.7
Cassava	17,2	6.3
Others	13,4	4.9
Total	272,6/Year	100

17 REMARKS ON SUSTAINABILITY IN AREAS WHERE LAND HAS BEEN ALLOCATED

by Dr Nguyen Tu Siem, Chief of Sciences Section, Institute for Soils and Fertilizers

Abstract

A survey on land and forest allocation and land use at the farm scale been made in the provinces of Bac Thai, Vinh Phu, Hoa Binh and Nghe An. The paper summarizes the survey results with emphasis on the present status of the implementation of the above-mentioned policies, the farmers feedback and strategies for sustainability. Some technical and socio-economic aspects of land use sustainability are also discussed.

1 Introduction

Environmental sustainability is essential in any system of land management. It is especially important in the upland areas of Vietnam, where the ecosystems are fragile, the soils marginal, and the vegetation has been drastically degraded. The farmers are the poorest communities in the country.

The policies of land and forest allocation to farmers have been being put into effect for more than 20 years and have had a number of positive impacts on land use and management. The State recognizes the farmers' rights to long-term use of land, inheritance, and exchange. The awereness of the farmers on the need for sustainable land use has been raised. And the care of the land has improved. Government policies have not been as detailed as they should be for application at local levels. There is lack of guidance and shortness of financial means. Lack of skill in implementing officers has retarded the process. During implementation, a number of shortcomings and adverse aspects have been exposed, and these have limited the effectiveness of the policies. This is a report of brief surveys made in 4 provinces Bac Thai, Vinh Phu, Hoa Binh and Nghe An on the farmers' responsesk to the policies of land and forest allocation and on their strategies towards sustainable land use. The impact of these policies on sustainability and environmental quality are also discussed.

2 Notes on implementation of land allocation policies.

Land allocation policies deal with both agricultural land and forestry land (land with forest and land for forest).

In the agricultural sector, farmers are more enthusiastic about land allocation and the process encounters few difficulties. This is because the lands have been thoroughly surveyed, classified and evaluated. And have been gradually allocated to farmers through many steps of the renovation policies in which the farmers have participated in the land evaluation and allocation.

Rights and obligations of the receivers are clearly defined. Most agricultural lands are flat

lands with boundaries clearly marked.

Quantitively, the distribution of lands has been based on the principle of equal portions per capita and qualitatively, each household has been entitled to both fertile and marginal lands, near by or at somedistance from the community. This led to dissection of the fields into numerous small pieces not suitable for crop management.

As lands are allocated once and for ever, the allocation of lands had a positive impact on the population size. Most young families stated that they would have few children because lands are not left in reserve for them. Some families who already have many sons are trying to buy the allocated lands from those having few sons but many daughters.

Concerning the agricultural lands, problems are most acute with the resettlers who came to the localities to join the cooperatives in the sixties. Major parts of their fertile cultivated lands were claimed back by the local former owners who friendly gave them before although this action is not legally recognized. In most cases, respecting the local customs, the new settlers had to turn back the lands.

In Bac Thai Province, up to 26 000 households have lost the cultivated lands which have been allocated to them by the authorities. With lack of cultivable lands,they have to encroach on other areas albeit in formal contravention of the law.

In the forestry sector, the areas to be allocated include both lands with trees (forest lands) and lands without trees (bare lands).

At the village level, forestry lands which are subjected to allocation, are classified into the following categories:

Bare lands: This term includes a vast areas of denuded hills and low mountains left for fallow or totally abandoned after intensive cultivation. The soils have been heavily degraded, being unsuitable for most annual crops grown in zero input systems. These lands can be subdivided at least into three subgroups with regard to their production potential:

Grade I-Bare lands of eroded skeletal soils having no potential for either annual or perennial crops;.

Grade II-Bare lands suitable for only forest trees and /or re-vegetation. This kind of bare land is steep with shallow soils, low in effective fertility and located far from the housing quarters.

Grade III-Bare lands potential for agroforestry at farm level are usually found in the foothills with flat to undulating topography.

In general there is no accute problem with allocating bare lands, except that people may be unwilling to accept them without technology to utilise them profitably and effectively.

Planted forests: In Vietnam, absolute ownership of the land remains with the whole

people. The production units/individuals merely acquire land use rights and control over the plants/animals the cultivated.

If the crops are perennial, the producers may retain control over the land for extended periods (to 50 years). This arrangement may appear like a private form of ownership, but differs from real land ownership. In the studied areas, rights to land use, provided they are well specified and practised, appear to be satisfactory for users. Interviewed farmers were more concerned with the value of land utilization rather than land ownership. Their ideal is:

- *Equity between users* (state, collective enterprises and farmer households).
- Perfected policies for the highlands with *priorities* for the minority ethnic groups.
- A harmonious *rural community* based on voluntary participation of individual members and operated by the regulations set up by them and for them in the framework of the national policies.
- National characters, culture, and traditions preserved and developed.

3 Creating conditions more favorable for land use sustainability

Lack of sustainability may be bio-physical and/or socio-economic. From the survey in the above-mentioned provinces it comes to us that at present the adverse impacts of man's activities should be removed before new techniques could be successfully introduced.

1. *Land and forest allocation* is prerequisite for land use sustainability and sound environmental sustainability. Its implementation is going on sucessfully in certain places and unsucessfully in the others.

To improve the process, we should:

- invest in land survey, measuring and mapping.
- classify in detail land and forest to be allocated.
- revise the projection background of State farms and allocate under utilised areas to farmers.
- define clearly obligations and rights. The unclear specification of rights and obligations is damping the enthusiasm of farmers for land and forest allocation.
- provide enough fund and facilities to do this
- train the local implementing staff

Land allocation is a necessary precursor, but insufficient in itself to guarantee sustainable land use. It should be followed by various activities to bring into real effect the rural

development policies at the farm level.

2. *It is imperative to protect and maintain existing forest areas in parallel with planting new ones.* Replanting forests and regreening bare lands are commonly very expensive, and if not well managed the results will be not proportional to the inputs invested. There is strong evidence that sustaining an equivalent area of forest, by investing in protection and maintenance is much cheaper than planting new areas.

3. Rural community has a low profile among the stronger communities in their dealings with *the financial and banking systems.* It is very difficult for small farmers to get a loan because of the complicated procedures. For the poor households, requirement of warantee is obviously too rigid and funds rarely go into providing infrastructure for small holders.

In general,the rates of interest are too high and the duration is too short for poor farmers to profit some advantages from these systems. A rate of less than 1.5% and a duration more than 1 year is proposed by the farmars interviewed. It is evident that the policies of subsidised price are more generous for the other sectors of economy than for the agriculture and forestry although the latter suffer more risk.

A reform of the existing financial and banking systems is urgent and the relevant regulations should be thoroughly revised. A rural credit system should be widely developed up to farmer level.

4. *Infrastructure* in the rural sector is too weak to support a sustainable production and a sound environment. The weakness of the irrigation facilities,transport systems,processing industry, education facilites have considerably limited the effect of the development projects.

Most farmers are in remote hilly and mountainous terrains with poor access,there is a serious problem of bringing the surplus products to local centers for marketing. Improving physical access to markets will contribute much to facilitation of supply provision and to validation of farmers' products.

Updating the infrastructure requires capital resources that the local budget can not afford.

5. *Extension services* should be strengthened. At the present time, they function like an administrative bureau rather than a technology advisory and transfer office.

We believe that the single most important factor limiting crop yields and sustainable land use in the uplands is soil infertility. Unless it is corrected,farmers will gain little benefit from the use of improved varieties and cultural practices. However, soil improvement projects often require a long period for providing benefit in term of soil fertility. So they should be designed so that immediate return could be generated hand in hand with the long term one. Attempt to impose the long term benefit projects has always ended with failure.

At best, the government only has the foreign exchange to import the minimum amounts of fertilizers required and the low-resource farmers only have little budget to spend for

fertilization. Therefore, the techniques to be transfered should be integrated ones which could maximally use up the local sources and generate not necessarily maximal crop yields,but maximal economic yields. We believe the increases of crop production and farmer income can be achieved by application of technology already available or well-advanced in the research pipeline rather than by those expensive and far-reaching from the poor farmers input capacity.

It is important to motivate the types of products of great degree of marketing flexibility which could overweigh the problems of poor access,processing and conservation.

6. Although farmer households have become self-governing production units,the *farmer communities* have an influenced role in the rural development in general and in the land use and management in particular. Appropriate forms of farmer communities (cooperative,mutual aid group, hobby group, association ect.) must be studied and promoted.

A lot of constraints to land use continuum can be overcome only with the joint efforts of farmers consolidated their community, but not an individual household. Likewise,the conditions ensuring sustainability of land use systems in the commune or larger scale can only be created by the communities (irrigation system,wind-break forest,fire control,plant protection,security etc.).

4 Concluding remarks

Since the farmer households became self-governing production units, strategies on sustainable land use and management have become quite diverse and dynamic. Food security is first component of their strategies and cash income is very important factor governing the strategies.

Short term and medium term strategies are the choice of majority of households. With land entitlement and a modest capital,about 10-15% of families become well-to-do ('rich class') and their land management can be classified as sustainable.

At present the socio-economic constraints appear to be more acute than the bio-physical ones. Conditioned more or less by market mechanism of economy, a majority of small farmers (about 75%) can not overcome the difficulties in initiating inputs without the support from the bank and credit systems.

Land allocation should be advanced, but its success will depend much on the improvement of the implementation conditions. Without a set of minimum conditions (indicated above) the process presents a formality and can cause immidiate adverse impact on land and forest sustainability.

Regarding the technical aspects of sustainable land use management, not expensive techniques, but those already available or well advanced in the research pipeline are expected to be successful and acceptable to farmers as indicated by analyzing the experiences of lead farmers.

Rural development and sustainable land use have been put always high in the government list of priorities. However,the relevant policies should be specified in greater detail and implemented by well-prepared staff with adequate resources.

References.

J.Dumanski, 1987. *An International Framework for Evaluation of Sustainable Land Management*. In'Land development and management of acid soils in Africa'. IBSRAM Proceeding No.7,Bangkok.

D.Greenland et al.,1994. *Soil, water and nutrient management research - A new agenda.* IBSRAM Position Paper,Bangkok.

N.S.Jodha,1990. *Mountain perspective and sustainability: A framework for development strategies.* Report. International Symposium on Strategies for sustainable mountain agriculture. Sept.10-14, 1990. ICIMOD, Kathmandu, Nepal.

V.V.Me et al.,1993. *Land classification and land allocation in Vietnam and in Tu ne commune (Tan lac,Hoabinh).* Ministry of Forestry, Hanoi.

18 THE APPLICATION OF PRA IN LAND USE PLANNING AT COMMUNE LEVEL

by Vu Thanh Mo, Forest Inventory and Planning Institute

1 Introduction

Unlike in the deltas, land use planning in highland and hilly areas is not well undestood. Apart from agricultural land under cultivation and land used for dwellings, roads, and graves... most of the land in mountainous and hilly areas is managed by the government. It is allocated to the State enterprises for management. Unfortunately these lands are often illegally used by the local people.

Since the land law and other policies came into being, these land areas - formerly listed as 'commodity remained non - use' have been allocated to different economic components for management. Now most of the land is allocated to the communities and farmer households (H.H).

Planning for land use has traditionally been top-down. Now, as land owners are active in land use within their allocated sites as regulated by the policies. The question is how to set out a plan for land use at commune and village levels which suits the desires and benefits of the land owners (the farmers) while it satisfies the community needs as planned by the District and Province.

2 The application of PRA

1. To plan for agricultural and forestry production, the first thing to be done is to work out a land use plan. Communal staff and farmers may not know how to do this. Government cadres must therefore provide assistance at the commune level. It is important that the cadres do not work out the land use plans themselves, but that the farmer makes the decisions about how to use the land.

There is no better way to achieve this, than that of the cadres living and working together with the farmers in their communities for at least two production seasons.

2. PRA is a method which has been developed to assist farmers willing to tell their ideas, opinions on things concerning their life. This is not a survey in form of a questionnaire planned, but interviewers observe, suggest, listen to and detect newly emerged things and flexibly raise simple and short questions and also play the role of a compere.

3. Through three phases of PRA application in localities.

- Pa-Ko and HangKia communes, Mai Chau district, Hoa Binh province: Aiming at detecting the shortcomings, constraints in production and living conditions of the local people and set out priorities for each category.
- Bang Lang commune, Cho Don district, Bac Thai province: Aiming at the setting up community forestry.

- Phong Du commune, Tien Yen district, Quang Ninh province: Aiming at making plan for land use.

Certainly, key demands are different from place to place, but the question of land use is always placed first importance.

4. Through the application of PRA in land use planning in commune levels mentioned above, the following conclusions can be drawn:

PRA method can be applied in survey according to different objectives, but in terms of land use planning of thousands of communes in the midland and highland which amount to 2/3 of the territory of the country, it is sensible to develop general regulations as objectives, demands, principles...while the approaching method is flexibly applied depending on the object of survey, concrete conditions of certain localities and certain period of time. Prior to using PRA, it is helpful to do or to have information on the following.

- Classify and identify existing land use:
  - Cultivation land (agriculture, forestry, pasture, fishing sites...)
  - Non-production land (dwelling, road, graveyard...)
  - Protected sites (watershed, nature reserves, others...)

- Identify the boundaries of lands allocated to different economic components: State units, privates, communities, households...)

- Identify land use purposes for each land categories such as agriculture production (rice field, corn field) cash crop sites, gardens, pasture, forestry land.

- Assess the forest role in case of ecology, environment and the potential of forest resources.

- Assess the land use status and effect.

With this information in hand, PRA can begin. There are three phases of PRA application process:

Preparation phase: This is an extremely important phase and is very necessary for PRA officers. They must:

- Study the available materials, data on natural, socio-economic and resources status of the location he/she is in charge of (district, commune)

- Carry out field survey on land use status, closely contact to local authorities who are conducting land use issue at district, commune levels.

- The survey allows to fairly imagine concretely the studied materials at the same time to grasp the most up-to-date situation, to get the useful remarks, ideas of the local authorities which are not shown in the studied documents.

- Work out plan for PRA survey: In the principal, it is to group the villages which have similar characters (ethnic group, farming system, the cultivating terrain) locations to be surveyed in the field, level the HH groups (rich, poor, medium or food-surplus, food-deficit HH...) sample the HH to be intensive interviewed, and clarify the concept of rich, poor ones based on the way of assessment of the local farmers.

The expanding phase: approaching and interviewing farmers as well as interview those met by chance in the way to the surveyed field have been shown in PRA paper for other countries and Vietnam as well. Bellows are some extraction:

- It is better to interview the farmers not only in their home but in the field as well, because, in the field they can tell lively information about their own land use or others' while they can' t tell at home as they can' t remember. The best time for interview at home is evening as almost all members of family are present. Bear in mind that friendly behavior plays the decisive role, questions to be raised must be easy to answer. And the form of interview must be done in talking manner.

- While exchanging ideas with farmers, it is important to understand the role, power right of each member in the family, language used must be popular, technical terms as hectare, kilo, slope ought to be avoided as the farmers don' t understand, so PR officers must convert into the equivalent units. Listening more than speak less is important and don' t ask them to give their conclusion frankly to each question. Comprehension task should then be done later and if interviewers don' t think that it is enough, just wait till next time and don' t try to force them to answer.

- The role of women is of great significance in a HH, it is why one of PRA officers is a woman, it is easy to approach the farmers in case of a direct talk.

Land use planning phase: After comprehending the findings of the expanding phase, a meeting should be held to discuss about land use in the communes, villages. PRA officers sum up the main features in connection to showing on the map, the names of the local places must be mentioned for farmers to follow and imagine. The most important is to pay more attention to the local authorities, experienced farmers.

After discussion, PRA officers must show the areas on the maps where certain measures ought to be applied, and the farmers will distribute their ideas and get the decision among the local authorities (commune, village levels).

3 Conclusion

The experimental use of PRA in 3 communes indicates its practical value.
In regard to the highland - the location for community forestry development - in which suitable land use play the decisive role, that is why it is necessary to immediately review, put forth regulations and guidance's harmoniously throughout the country in order to work out plan for land use with high possibility of implementation at micro level.

19 LAND USE CLASSIFICATION IN VIETNAM

by Nguyen Ngoc Nhi and Vo Van Du

1 General features of land use in Vietnam

Vietnam is situated in central Southeast Asia within the tropical zone of the Northern hemisphere a little bit close to the tropic. It lies between 23'24 - 8'35 North latitudes and 102'10 - 109'26 East longitudes excluding thousands of islands belonging to Vietnam.

Vietnam has a shape of an S, large in both ends (the deltas) and narrow in the middle. The North-South length is 1,650 km, the widest east-west distance is 600 km and the narrowest one is 50 km (Quang Binh province) and the highest peak is Phanxipang 3143 metres. The coastline is 3,260 km and 3,700 km border line with 3 neighboring countries, China to the north, Laos and Cambodia to the west and southwest. Due to its geographical location, VN enjoys sunshine round the year with positive sun radiation balance and rain happens by seasons, the alternation of different kinds of wind, and is there a lot of fauna and flora species immigrate into the natural features are plentiful and diverse and complex.

The history of development of nature, particularly the history of neo-tectonics are the causes which result in the peninsular which are mountainous and hilly characters, symbolic features of the country.

Four fifths of the mainland territory of Vietnam is covered with mountains and hills while the delta amounts only to a fifth of the natural land and the deltas concentrate in the estuaries.

Naturally, mountains in Vietnam are old ones, juveniles during the process of motion of neo-tectonics and elevated gradually by many historical stages of nature that results in the terraced topography in which low mountains of less than 1000 metes amount to 85%, while high mountains (over 1000 metes cover only 14% and 2000 metes upward 1%. Mountains in Vietnam, however, are low but very difficult to assess and separated by the stream system. they are both steep and dissected.

The terrain is rather flat in some of the high land, convenient for exploiting and the become the economic centers of the mountainous areas.

The soil of Vietnam is formed and developed in diverse and complex natural conditions consequently there are different soil types. According to the findings of soil classification made by Vietnamese pedologists, soil in Vietnam can be classified into 14 groups and 68 types.

1. Sand dune and sandy soil in the coastal zones (5 types)	502,045 ha
2. Salted soil (4 types)	991,202 ha
3. Alkaline soil (4 types)	2,140,306 ha
4. Old alluvium (15 types)	2,936,413 ha

5.	Swampy soil and peat (3 types)	71,796 ha
6.	Poor grey soil (7 types)	2,5481,987 ha
7.	Red and dark brown soil in semi-arid zones (2 types)	34,734 ha
8.	Black soil (7 types)	237,602 ha
9.	Yellow red soil (10 types)	15,815,790 ha
10.	Red yellow humus on mountains (6 types)	2,976,313 ha
11.	Humus on high mountains (2 types)	280,714 ha
12.	Alluvium in valleys (1 types)	330,814 ha
13.	Soil that exposes to the light (1 types)	505,298 ha
14.	Podzodic soil (1 types)	negligible

Vietnam is ranked 55th among 200 countries in the world as far as territorial land area is concerned with 72,6 million inhabitants (1994). So, in case of land area per capita, it is very low and ranked 20th while the distribution of labour force is uneven. Most of the population locate in the deltas 1989 census data show that 19,36% of the population live in the urban areas and 86,64% in the country. The Vietnamese amount to 86,87% and mainly concentrate in the urban and delta areas, the rest are 50 ethnic minority groups, and live in the high land areas. Until recent 55% of the total nature land are used as agricultural and forestry land, dwelling, specialized land. The highest of rate of land use happen in 2 areas that are the Mekong delta, 80% compared ta that of the natural land of this delta, and the Red River delta, 77,24%. Then, the Western Highland 69,85% the Southeast 66,89%. The Former Fourth Zone 51,83%, the Central Coastal zone 48,35%. The lowest rate of land use happens in the mountainous and hilly areas 34,13%.

Land used agriculturally is 6,993,000 ha or 21,13% of the natural land or 38,5% of the total used land. In which, land covered by annual crops accounts for the greatest rate of agricultural land throughout the country, say 76,3% or 88,64% in the Red River delta, the Western Highland 56% the lowest rate of annual crops cultivated but the Western Highland cover the largestrate of land area to plant cash crops as coffee, rubber say 35% of agricultural land of the region.

Land used for forestry purposes is 9,359,200 ha or 28,38% of the natural land and nearly most of it covered by natural forests say 92,85% and the rest covered by plantation is 7,15%. Natural forests in the Western Highland covers 60,04% of the region or 33% of the forest area of the whole country, the Mekong delta 3,71% and the Red River delta 2,54% of the total forest area.

Specialized land (but non-agricultural and forestry uses or dwellings) covers an area of 972,190 ha or 2,93% of the total land. Comparing the specialized land with the natural land of the region we can see that :

- The Red River delta : 10,83%
- The Mekong delta : 3,92%.
- The northern central coastal zone : 2,16%.
- The Western Highland : 0,84%.

The 2 categories of specialized land which account for the largest areas are road system : 23,77% and irrigation system : 35% of the total specialized land.

- Dwelling accounts for (1990) 817,750 ha or 2,47 % of the total natural land.

  - The Red River delta : 6,42% of the delta (Highest)
  - The Mekong delta : 5,15% of the delta.
  - Eastern most : 4,44% of the region
  - Central Coastal zone : 1,44% of the zone.
  - Western Highland : 0,95% of the region (lowest).
  - Northern most and middle areas : 2,03% of the areas.
  - Formal Fourth zone : 1,57% of the zone.

- Non-used land consisting stream and river surface covers an area of 14,925,000 ha or 45% of the total territory. This category of land distributes in 4 regions and amounts to 87% : Northern most and middle areas, the Former Fourth Zone, the Central Coastal zone the Western Highland in which specialized land concentrates mainly in the Middle, mountainous areas which cover 43,28% of the total specialized land. Non-used hills and mountains cover 75,5% and the flat terrain cover 6,94%, stream and river 16,5% of this category

- The compared figures between 1990 data and 1985 data show that agricultural land increases 0,74% plantation area increases while natural forest reduces rapidly say, forestry land reduces 2,56% area for road system increases 11,6% nearly 5000 ha in creasing annually in average. Land conversion into irrigation use increase 39,1% or 20,000 ha annually in average. Land conversion into construction increases 5,8% or 11,000 ha/year averagely.

- Due to the rate of population increasing rapidly that's why the average of natural land per capita as well as other land use is low compared to the world, and reduces greatly.

m^2/ inhabitant	1980	1985	1990
natural land	6.419	5.517	5.139
agricultural land	1.318	1.159	1.086
cultivated land	1.137	0.938	0.892
forestry land	1.800	1.610	1.458

Within 5 years (1980-1985) 22 provinces and cities in 4 regions :

- The Red delta, the Western Highland, the Southeast, the Mekong delta : 660,000 ha were reclaimed while in other 3 regions.

- Northern most and Middle areas, the former Fourth Zone, the central Coastal Zone - 850,000 ha become fallow again. That into say that total land use reduces 0.15% during the period 1985-1990.

2 Land use classification

This activity consists of two things: land use status classification and land use potential

classification. This will greatly help the planning and management of land use at all levels concerning land use.

In the recent 30 years, many studies were done and many land use classification systems were worked out. Until recent, no system was widely discussed to win the support of the scientists. In land use classification, there remain 3 systems belonging to 3 functional sectors who are important bodies in land use and land management. They are the General Department of Land Management, the Ministry of Agriculture and Food Industry and the Ministry of Forestry. Besides, the Ministry of Construction in the urban and rural planning also deals with land use classification.

The difference among these system cause great difficulties for the use and supply of information on land use among the sector.

To contribute to the construction of a harmonious land use classification system throughout the country that suits the Land Law, and approaches the scientific progress in this field of the world, and suits the practical land use in Vietnam with its daily changes, a body of scientists consisting of Dr. Bui Quang Toan, Dr. Nguyen Xuan Quat, Eng. Vo Van Du, Eng. Nguyen Van Khanh (Ministry of Agriculture and Food Industry, Ministry of Forestry, Ministry of Construction) presided by Dr. Nguyen Ngoc Nhi has worked out the table of land use classification of Vietnam. This draft was sent to different scientists for contributing. Contributed ideas gained from Dr. Ton That Chieu, Eng. Pham Thi Binh, Dr. Phan Dinh Quac, Dr. Le Hong Ke (economist). Architect Le Hoang Huan, Dr. Siem, Dr. Nguyen Dinh Sam and Dr. Nguyen Huy Phon.

Concerning the system of land use potential classification the working group suggests that, it is necessary to deal with survey in different locations and carrying out experiments to get the initial suggestions for planning and land use in agricultural and forestry production and in protection of soil against degradation and erosion.

Land use status classification: The authors analyzed and employed the existing systems, compared to the field check and based themselves on the Land law (1993) and guides made by FAO and also consulted foreign material which have similar economic and natural conditions to draft the Land Use classification system.

The classification system consists of three levels :

- Type: by specialized management of land use, in connection to the Land Law 1993.
- form : basing on the general status in the field.
- Land Use form : basing on the concrete status in the field.

However, this draft of land use classification system consists of only 2 categories of land: Agricultural and Forestry land as they cover the most part of the territory, while other categories consists of only 2 levels : Type and Form and the specialized sectors will better propose the land use type that suits that sector for example the case of land for urbanization.

- Dwelling should be classified in some items: permanent houses and temporary houses, semi-permanent houses... villas, blocs... one storeys, 2,3 storeys...
- Specialized land: land for road, airport, railway should be classified.

The system of Land Use Classification in Vietnam (draft).

1. Agricultural crops
    - 1.1.1 Rice
    - 1.1.2 Rice and corn
    - 1.1.3 Vegetables and corn
    - 1.1.4 Sweden
    - 1.2 Perennial
    - 1.2.1 Cash crops
    - 1.2.2 Fruit trees
    - 1.2.3 Other perennial
    - 1.3 Pasture
    - 1.3.1 Natural pastures
    - 1.3.2 Artificial pastures

2. Forestry land
    - 2.1 Natural Forests
    - *2.1.1 Natural Broad-leaved forests*
    - 2.1.2 Coniferous forests
    - 2.1.3 Mixed forest (BLF and CF)
    - 2.1.4 Open forest (Dipterocarpus)
    - 2.1.5 Pure bamboo forests
    - 2.1.6 Mixed forest (Timber + Bamboo)
    - 2.1.7 Mangroves
    - 2.1.8 Nippa
    - 2.2 Plantation: As mentioned in 2.1.1 and by species
    - 2.3 Shelter
    - 2.4 Scattered trees
    - 2.5 Shrub and bush
    - 2.6 Grass land

3. Water bodies
    - 3.1 Water surface for marine culture
    - 3.2 Water surface for other use

4. Urban (inside city, town, townlet)
    - 4.1 Dwelling
    - 4.2 Public works
    - 4.3 Parks, play grounds
    - 4.4 Road, square
    - 4.5 Cultural work
    - 4.6 Offices
    - 4.7 Industrial use, stores
    - 4.8 Military use

4.9 Other

5. Resident area (rural)
   - 5.1 Dwelling
   - 5.2 Garden
   - 5.3 Road
   - 5.4 Public works

6. Specialized land
   - 6.1 Industrial zone
   - 6.2 Road
   - 6.3 Irrigation
   - 6.4 National parks, nature reserves...
   - 6.5 Military use
   - 6.6 Mining area
   - 6.7 Production of china, pottery, brick...
   - 6.8 Salt field
   - 6.9 Graveyard
   - 6.10 Ground for waste things

7. Non-used land
   - 7.1 Fallow land in the plain
   - 7.2 Swampy land along the rives
   - 7.3 Sand dune along the seashore
   - 7.4 Swampy land along the seashore

The classification of land use potential: The fact that this classification is of significance in sloping land while others were efficiently used without doubt. That is why, the used criteria inland use classification mentioned below are limited by the sloping land mainly agricultural and forestry production.

Studies made by most countries which have sloping land aim at the identification of the limited sloping levels for agricultural use. Take the case of the former Soviet Union(< 50), the Caribbeancoutries (<100). Indonesia (<220). The maximum sloping level can't be need for agricultural production but forestry use only say over 300. The criteria and measures for sloping land use made by FAO based on sloping and soil depth.

Soil depth is classified in 4 levels:
1. Over 90cm
2. 35 - 90cm
3. 20 - 35cm
4. Less than 20cm

Site with soil depth of less than 20 cm in any sloping level is left for natural regeneration, and the sloping level is classified by 7:
1. 0^0 - 2^0
2. 2^0 - 7^0
3. 7^0 - 15^0

4. 15^0 - 18^0
5. 18^0 - 25^0
6. 25^0 - 35^0
7. Over 35^0

Site with over 350 sloping is left regenerated naturally. Site with soil depth of over 90 cm and 20 sloping is used for annual crops and they must be measures to protect it from erosion. Also site with soil depth of 20-35 cm and the slope of 20 is used to graze castles, grow fruit trees and forest trees but there must be measures against soil erosion.

In Vietnam, since 1975, the Government issued Decision No.278/TTP (11/1975) on the orientation of land use basically based on 2 categories : slope and the depth

- Site with soil depth of over 35cm, slope of less than 150 issued agriculturally in connection to the irrigation system.

- Site with soil depth of less than 35 cm (> 250) for forestry.

This Decision is better than those happened before 1975 as they based on slope (>250) only, and this type of site is for forestry. It is difficult to identify consistently if only the depth of the surface soil is identified as the identification of the soil depth is more suitable to our condition. While doing this different sectors have different regulations particularly the case of forestry and agricultural sectors:

Agricultural Sector:

- Slope is divided in 6 classes
  - < 50
  - 50 - 100
  - 100 - 150
  - 150 - 200
  - 200 - 250
  - Over 250
- Soil depth (5 classes)
  - < 50 cm
  - 50 - 70 cm
  - 70 - 100 cm (120 cm)
  - 100 - 150 cm
  - > 150 cm

Forestry Sector :

- Slope (6 classes)
  - > 30.
  - 30 - 80
  - 80 - 150
  - 150 - 250
  - 250 - 350

- Over 350

- Soil depth (3 classes)
  - < 30 cm
  - 30 - 80 cm
  - > 80 cm

There are other type of classifying the slope and the soil depth of many scientists who proposed in some of the studies that change the slope classes and soil depth classes mentioned above. But, in general, it is possible to with draw some of the principal classes to consistently use throughout the country.

The aim of land use potential classification is to get scientific bases for the organization of land use reasonably at the macro level. This must also deal with the climatic factor in which the question of temperature must be particularly paid attention to as well as rainfall, but the climatic factor is sun harmoniously, so the remained question is to deal with other factors that directly impact the growth, development of the cultivated species. That is to say about the operating space of the root system and the fertility in soil. It is possible to push forth various important factors including the micro factor, but no need to, and only the symbolic factors ought to be chosen as follows :

- Minimum soil depth : The soil depth is limited when the root system meets with obstacle materials as compaction and sealing materials or rocks (75% in soil) of the profile of the emerging layer.

- Hardpan : Shows the difference of soil texture, acidity and alluvium in soil.

- Slope : an indirect factor but most important one that helps to orient land use, to decide soil preparation measures and that greatly impacts on erosion.

- Land use status (species composition vegetation ....) is the result of the development in the past and also the premise for future land use.

A site of the same slope, soil depth, hardpan, land use status will probably be suitable, or limits the growth of a species among others with the same human being is impacts.

The criteria used for land use classification are given below:

1. Slope:
   Class 1 : < 30
   Class 2 : 30 - 80
   Class 3 : 80 - 150
   Class 4 : 150 - 250
   Class 5 : 250 - 350
   Class 6 > 350

2. Soil depth (cm)
   Class 1 : > 120
   Class 2 : 80 - 120

Class 3 : 30 - 80
Class 4 : < 30

3. Hard pan group
   - Alkaline stone
   - Clayey stone
   - Sand stone
   - Old alluvium
   - Magma acid

4. Land use status : Mentioned in the Table of Land use Classification (draft)

3 Some of the remains and proposals

Land use classification nation-wide consists of 2 categories as mentioned: Potential and Status. The activity is fully supported by everyone, and it also wins the attention of authorities and scientists, but it is not an easy job. That's why until now, no studies are accepted to be the good one is easily understood.

The proposed draft table of land use classification presented in this paper should be further discussed. It is suggested that, for the convenience of management by sectors, road system, irrigation system in specialized land category should be categorized equally to agricultural land, forestry land categories. Another suggestion was that fresh water body should be separated from non-fresh water body.

Concerning the forestry land, it is necessary to classify in 3 different sub-categories : Protected area, Natura Reserve Area and Production Area.

Even in the Working Group for Land use Classification, there has been persistent opinion on the separation of the agro-forestry land as an independent category as this land use type at present is applied popularly and efficiently, and it is a scientific progress in land use...

On the classification of land use potential : This task is quite new and has just been started. It is necessary to sum up into group, type, category, and in each category, concrete orientation of land use must be proposed with economic and environmental efficiency. This could only be done on the basis of survey, analysis of the growth situation and economic and environmental efficiency of each of species planted on different sites of deferent conditions.

Until recent, with the present status of land use and the existing knowledge of the Vietnamese scientists in this field, such remains, constraints mentioned above could easily be overcome on condition that time and budget must be available.

20 USING BIO-CLIMATIC DATA AND GIS TECHNOLOGY FOR MAPPING ECOLOGICAL ZONES FOR SOME FOREST PLANTATION TREE SPECIES

by Dr Hoang Xuan Ty and Dr Trinh Duc Huy, Forest Science Institute of Vietnam

1 Introduction

To regreen extensive denuded hillsides and restore the ecological equilibrium for better land use, a number of forest plantation programmes have been developing in Vietnam.

The main lesson from what has been done is that errors in the choice of tree species used have been noticed only after a long period, when correction measures have become expensive.

Because of this, mapping ecological zones for successful planning of tree crop farming has become essential.

Climatic data covering a wide range of factors have been made available by the Meteorology and Hydrology office. The use of these data for mapping climatic zones for more objective planning in tree crop farming is lags behind. A scientific approach to this problem is needed.

Single factor climatic maps are not of much help for the identification of suitable zones for planting operations. More recently, a series of "agriculture bio-climatic zones" maps have been produced, based on two main factors: air temperature and relative humudity.

These maps cannot yet be used effectively for the identifition of suitable zones for successful tree plantation as the response of tree crops to a wider range of climatic factors are not fully understood.

The main objective of this study is to produce maps showing relevant climatic factors of importance for the growing of specific tree crops. Using GIS technology, overlaying and matching maps of single factors, that through field studies been found to be the key factors for successful plantation of the tree species under study. This technology allows the use of a wide range of climatic, and edaphic data now available from established data bases.

2 Methodology

The methodology is based on GIS. For mapping ecological zones for a specific crop plantation, the following steps are necessary:

- Storing data from single-factor maps into computers.
- Identification of "ecological thresholds" of most important climatic factors limiting

the growth of the species under study.

- Overlaying and matching single factor maps with the ecological thresholds.This produces maps showing climatic aand edaphic zones suitable for the cultivation of the tree crop under study.

The detailed steps are described below.

Step 1: Storing data from single -factor maps (all scaled at 1/10-6 for the whole country).

- Establishment of a grid network (the grid square being of size 4mm x 4mm representing 4km x 4km each on field condition). Vietnam is being covered with a grid of 20,020 squares.
- Plotting data of "single climatic factors" on maps based upon the grid network established.
- Description of climatic characteristics of every grid square on maps based upon a system of coordinates, to be followed by storing the data in lines and columns into computers.

Step 2: Identifying the range of the climatic or edaphic factor under study promoting and limiting the growth of the tree crops consideration to shape out the "Climatic Conditions Specification" Table.

The "Climatic Conditions Specfication " Table is based upon:

- The relationships between the single climatic factor and the growth of the tree species, its yields on stands established in various zones of the country where that climatic factor prevails.
- Specific features of the climatic factor under study recorded in zones where the tree crop occurs naturally and thrives well (for example, for Pinus kesiya, specific conditions of the climatic factors of da Lat and Hoang Su Phi are taken into consideration; they are considered as "key zones" for the listing out of variations of the climatic factors affecting the growth of the species).
- Analysis of all studies identifying favourable and limiting climatic conditions for the growth of the species under study.

Step 3: Production of maps (multi-factor in nature) showing climatic zones for potential cultivation of the tree species under study, though overlaying maching of "single -factor" maps.

- Based upon data from "Climatic single - factor" maps (obtained in Step 1) and the "climatic conditions Specification" Table established for one specific tree crops, the production of maps showing climatic zoned for potential cultivation of that tree crop is made with the use of computers.
- For easier use of the material produced, 4 classes of suitablitity have are indentified for each tree species:
  S1 = Very suitable S2 = Suitable
  S3 = Less suitable S4 = Not recommended

3 Potential "Climatic Zones" for a Pinus kesiya plantation

Pinus kesiya - referred to as Thong Ba La in the vernaccular occurs naturally in India, Thailand, the Philippines, Laos, Burma and Vietnam. In Vietnam, it is found on extensive areas in the Uplands (at elevations of 700-I, 500m), in particular at Dalat, Konplong, Daclay (in Lamdong and Gialai- Kontum Provinces respectively), and at Hoang Su phi (Hagiang) and Mu cang chai (Hoang Lien Son).

Its natural habitats extend over 12° - 15° latitude North, and 92° - 121° longitude East, at elevations of 800-2,500m ASL, in areas with an annual rainfall of 1,500 - 3,000mm, annual, daily temperature of 18-20°C. Its submarginal habitats are found at elevations of 300-400m asl, in areas with an average annual daily temperature over 22°C; the species can stand 5-6 dry months.

Based on comparative studies and other relevant references, the 4 following single factors have been indentified as the most important for successful plantation of the species:

- Total annual heat (in terms of sum of daily temperatures in °C)
- Average temperature of the hottest month (July)
- Hydrothermal coefficient in the cold season
- Length of the dry season

The "key areas" used for the assessments of climatic conditions when shaping out "Climatic Conditions Specifications" for the species are Da Lat, Hoang Su Phi and Mu Cang Chai. The limiting factors in the Lowlands are the high summeer temperature, and the low humidity of the dry season.

Table 1: Best Climatic Conditions for Pinus khesya Establishment

Serial number	Climatic Factor	SI (very suitable)	S2 (suitable)	S3 (less suitable)	S4 (Not recomended)
1	Total annual heat (in°C)	< 700	7.000-8.000	8.000-9.000	9.000 <
2	Average temperature of the hottest month (°C)	< 24	24-28	24-28	28 <
3	Hydrothermal coefficient in dry season	> 0.5	0.3-0.5	0.3-0.5	< 0.3
4	Number of dry months	≤	3 - 4	> 4	4 <

Following Table 1, S1 zones are those in which the 4 relevant single climatic factors are optimal. Identification of S2, S3 and S4 zones have been made following the described principle, using lesser climatic conditions.

The overlaying/matching of 4 relevant single factor maps on computer with the conditions mentioned in Table I has resulted in the production of maps showing various climatic zones of different suitability for the cultivation of Pinus khesya. The areas of various zones shown can be estimated through counting the number of grid squres in each zone delineated.

Final results read as follows:

- *S1 zones*: account for 6.8 per cent of the total country land area. They are found mainly in:
  - Da Lat (Lam Dong);
  - High Mountain areas of the Northern and North Eastern parts of kontum;
  - High Mountain areas of Northern Vietnam bordering Chinese borders in Hoang Lien Son, Lai Chau and Ha Giang provinces.
- *S2 zones*: accounting for 27.8 pct of the total land area; they are found at the Lower Mountain areas of lam Dong , Kontum, Lao-Viet border, and of the North west and the North East (next to Chinese borders).
- *S3 and S4 zones*: being the rest of the country.

Potential "climatic zones" for Pinus kesiya plantation are: the 3 S1 zones + parts of S2 zones as mentioned above.

4 Potential Climatic Zones for Pinus merkusii plantation

According to Kooling (1972), Pinus merkussii naturally occurs on 350.000 hectares in south East Asia. It can be seen in Borneo, sumarta (Indonesia), the Philippines, Thailand, Lao, Cambodia, in particular in areas of 1.500 - 2.500mm of annual rainfall and at elevations of 50-900 m asl .

In Vietnam, Pinus merkussii has been planted widely from the hilly areas in the North, along Central Vietnam to the Lower Mountain area Lam Dong.

Based on the yields obtained and with reference to the main conditions of various climatic factors recorded in "key areas" (i.e.at Hoang Mai, Ky Anh. A "Climatic conditions Specifications" Table has been set up to help identify the best zones for cultivation; (Table 2). Data were also presented for Pinus merkusii, they can be obtained from the author, but for brevity and relevance are not are not given here.

5 Potential "Climatic zones" for Cashew plantation

Cashew is a tropical tree species, thriving quite well on poor and marginal sites and has produced good incomes to planters in the South of Vietnam.

The 3 following single climatic factors are found to be importance for the cultivation of that crop, viz:

- Total heat in the cold season (having a decisive impact on the success of cashew plantation);
- Sunny hours in the cold season; and

- Hydrothermal coefficient in the cold season.

The two last mentioned factors have their impacts on fruit setting as cashews flower in December and January; in case of overcast weather, fruit setting will fail to occur. A "Climatic Conditions Specifications "Table is available from the author, but is no reproduced here. Comparable work has been completed for Acacia auriculiformis.

Of the 4 species under study, A.auriculiformis seems to have larger potential zones for its plantation. Areas in which plantation of A. auriculiformis should be discouraged are those found in the Northern province of Vietnam, in which low temperatures in the cold season due the impacts of North Easterly winds may destroy the plantation.

6 Observations

Using the climatic data available and the GIS technology, maps showing climatic zonnes can be produced for forest tree plantation planning and tree growth prediction with much more objectiveness than before. As they are, the maps produced for the 4 tree species under study seems to concur with the realities found in field surveys.

The methodology used suits situations in which planning at a "macro" level is required.

For in-depth studies, it is necessary to carry the same study at the Regional and Provincial levels, using for this, base maps scaled at I/50.000. It is also preferable to use information on topography, soil conditions, vegetation cover types, land uses ... and other relevant social and economic conditions so to re-shape "climatic zones" maps into ecological and socio-economic zones maps for more intensive studies.

The methodology used has yielded realistic results and as such should be further developed and then extended to Provincial forest authorities for use in their field work.

21 THE TRANSFORMATION OF RURAL LAND INTO LAND FOR URBAN DEVELOPMENT IN THE PROCESS OF URBANIZATION AND INDUSTRIALIZATION IN VIETNAM.

by Le Hong Ke, Ministry of Construction

1 Introduction

In every nation, land has an important role in the development of the economy Land is decisive for agricultural and forestry production systems... Land is also fundamental in the development of urban systems and the process of urbanization. For these reasons, the Land Law of Vietnam has specified clearly the importance and value of land.

The Land Law, together with many under-law documents and guiding regulations have been issued. The most important outstanding task is to plan exploitation and use. Land Use Planning may take the following steps.

- Mapping the resource.
- Planning the use of forestry land.
- Planning the use of agricultural land.
- Planning the use of urban land.
- Planning the use of residential regions in countryside.
- Planning water use.

Planning urban land use, is an integral part of the development process.

In this report, some important features of the transformation of agricultural and forestry land in the process of urbanization and industrialization in Vietnam are discussed.

2 The process of urbanization in Vietnam

The population of Vietnam at present is about 70 million, amongst which there are 14 million people living in cities and urban areas, accounting for approximately 20%. According to the forecasts for the year 2000, the total population of Vietnam will be 82 million people, 20,5 million of whom will be urban people, making up 25%. And by 2010, the population will have reached 97 million, of whom 35 million will be urban. This is 36% of the population. This is below the average level of Pacific-Asia region (48,4%), and very low when compared with the urbanization rate of most developed countries (over 85%).

Industrialization and modernization are the basis and background for the urbanization of a country. The political report of the Central Committee of Vietnam' s Party stated clearly at the national delegates' conference "Although there are still so many weaknesses that we must overcome. We have achieved success in creating premises (industrial and work sites), which help our country to enter a new period of development, the period is a further step toward the industrialization and is of first and foremost significance.

Our economy is rapidly becoming industrialized. According to the estimates of or economists, the density of industry and services in the economy will increase from 59,8% in 1990 to 73-74% in the year 2000 and 87% in 2010. Meanwhile, the density of forestry and agriculture is decreasing from 40,2% to 13% in corresponding times. This will lead to 2 important problems:

- The first one is that a part of the agricultural and forestry land must be given to the construction in order to develop cities and industrial zones. This will have negative effects on the environment.

- Secondly, it will become necessary to move some of the people living in agricultural regions to urban areas where they will earn their livings in industry or the sevice sector.

3 The national strategy of developing urban areas up to the year 2010.

According to the draft of this strategy the economic situation in Vietnam in the year 2000 is predicted to be as follows:

- Following industrialization, which has mainly been carried out in urban areas, GDP will increase by 2 times as compared with the year 1990; and urban areas alone will contribute up to 65% of GDP in the year 2010.

- In the following decades, it will become necessary to concentrate on development and construction in cities.

The areas with high and rapid development growth will be:

* The growing triangle zone of Ho Chi Minh city- Vung Tau - Bien Hoa
* The developing corridor of Hanoi capital - Hai Phong - Quang Ninh
* The developing corridor of Da Nang - Hue - NhaTrang

After some decades, from 2020 on, when the above mentioned development zones are strong enough and it is no longer advantageous to continue "pressuring" to develop in these areas, the development of a medium and small size cities' system in the whole country will become necessary.

From the whole country' s stand, urbanization and the development of industrial areas is the power house driving the development of the national social economy. The success of that process will depend on the availability of land resources.

4 The situation of using urban land

In Land Law, clause 5.5, article 3 of chapter III specifies clearly the definition of urban land : it is the land inside the city, inside the town, inside the townlet, which is used for constructing residences, head offices of organizations and offices organizing manufacturing locations, infrastructure projects serving public, military, security benefits and other purposes. According to the definition and classification of land in planning

urban land, urban land can be divided into the following kinds:

- Civil land, which includes of kinds of land used for constructing residences, projects serving public in administration, trade, education culture, researching science and technique, green tree park system, gardens and water surface, which provide good entertainment and improve micro weather conditions as well as urban environment. Civil land usually gets about 60-70% of constructional urban land.

- Urban traffic land, which includes the land for constructing all kinds of streets, other external routes like: railways, highways, railways station systems, airport and sea port systems, bus stations, parking systems... Urban traffic land often accounts for 10%, this finger is depending on the scope of the development in each city's plan.

- Industrial land, which includes land for constructing industrial factories, export processing zones (EPZs), handicraft manufactures and storage serving industry. Industry land often gets from 20 to 30%.

- Specialized land, which is all kinds of land except the above mentioned kinds. It is the land for historical vestiges, famous landscapes, security and National defence, land for cemeteries and land used for other non-agricultural purposes. The percentage this kind of land takes, depends on the characteristics and specific features of each city.

Up to now, there hasn't been a survey of urban land based on the above definition.

However, according to urban project makers, each urban person needs to use from 100 to 150 m^2 of urban land on average. This area mainly has been put in use in cities and urban regions, the other part has just transformed from agricultural land (in cities of seaside delta) and forestry land (in cities of midland and mountainous area). At present, the foundation of some large deelopment zones has reduced the Agricultural land fund considerably. In the country 6 development zones with thousands of ha have been started. These are:

- Tan Thuan EPZ, Ho Chi Minh city: 300 ha
- Linh trung EPZ, Ho Chi Minh city: 60 ha
- Noi bai EPZ, Hanoi city: 120 ha
- Hai phong EPZ: 300 ha
- Da nang EPZ: 120 ha
- Can Tho EPZ: 57.1 ha

In addition to these large industrial zones, there are some area areas of industrial petro-chemicals, and industrial metallurgy, whixh will develop in the near future... The locations of these new industrial zones are being decided, the areas required will be up to thousands of ha.

In our time, entertainment in urban areas is becoming a very big demand. The demand

for developing international and domestic tourism is not only to satisfy sight seeing, entertainment needs but also to contribute a considerable part to GDP. That is the exploitation of coastal areas, and of island areas such as Ha long bay, Bai chay, Tra co, Do son, Sam son, Non Nuoc, Da nang, Nha Trang, Vung Tau as well as the midland and highland areas such as Sapa, Tam Dao, Soc son, Ba Vi, Suoi Hai, Hoa Binh, Yen Tu, Da lat... As mentioned above, in the near future, the growing triangle and development Projects and constructions belonging to the infra-structure corridor such as roads, drainage, bridges, ports, leading technical projects and the region's residence system... will take a very large area, up to tens of thousands of ha. It is very clear that annually a considerable area of agricultural and forestry lands will be needed for constructing cities and infrastructure.

At present, in many cities, the overall planning projects have been studied and approved. This creates favorable conditions for planning the use of land in different periods in the proper way. Good planning can satisfy urban development needs and avoid an unnecessarily massive take of rural land, which would lead to waste and disorder.

5 Conclusions and other proposals

General situation

The transformation of rural land into the land for construction of cities in the process of industrialization and urbanization of the country is proper and necessary. The process of this transformation consists of:

- Improving and expanding the system of more than 500 cities in the whole country (2 of the first grade, 10 of the second grade, and more than 450 cities belonging to the third, fourth and fifth grades).

- Constructing Export processing Zones and Industrial zones.

- Organizing entertaining, tourist systems in different forms to serve cities, industrial zone and the people from inside and outside of the country.

- Especially, urbanizing in 3 growing triangles and development corridor.

Proposals

In order to manage the use and exploitation of urban land well and efficiently, especially the land transformed from rural land, it is necessary to do the following:

(1) Firstly to classify and quantify exactly the existing land resource in cities in the scope of the whole country. This work surely will take much time and expense technology (by air-pictures or by far investigations).

(2) To implement well the State's management of urban land under 13,55 (chapter II) 56,57,58,59,60 and 61 (chapter IV) of land law. In addition, to implement Governmental decision in this question, which is precisely:

- Investigating, measuring and making official geographic maps and pricing different urban land types

- Making projects and schemes, strategies of using urban land

- Entrusting and renting urban land

- Getting back land in order to construct cities

- Constructing cities infrastructures

- Registering and issuing certificates ensuring the right to use urban land

- Carrying out the necessary procedure to transfer the right to use urban land

- Inspecting and settling disputes and violations in using city land

(3) Urgently to prepare projects for planning and constructing cities, ready for approving (for the cities which haven't got approved projects), to check and readjust projects (for the cities, which have got approved projects) if it is necessary. On this base, to make the suitable plan of using land for each period of time, to meet the needs of reality in order to avoid the massive land take, but this land is not used completely, then it leads to a big waste. This is a very important legal basis, a very efficient instrument for the efficient State's management of urban land use.

(4) An interaction between branches in every level from the Governmental to local is necessary to co-operate in carrying out surveys investigations, projects and States measures to manage the use of urban land.

(5) It is good to make use of technology finance and experts of many international organizations to carry out efficiently the above mentioned measures.

22 USING GIS TECHNOLOGY FOR MAKING RECOMMENDATIONS ON FOREST LAND USE IN BAC THAI

by Lai Huy Phuong, Centre for Forest Information and Consultancy

1.1 The importance of forest land use planning under present settings

In line with the country's economic reform, the Vietnamese Forestry Sector has been developing policies and strategies for sustainable forest land use, for a gradual improvement of local farmers' living conditions and rural development in the uplands.

Two key policies have become the focus of activity:

- that of land and forest allocation to upland farmers and to other beneficiaries within various sectors of the national economy therein for developing existing forest resources, regreening denuded hillsides, furthering forestry development through community forestry (or social forestry).

- that of channeling support resources from the Government and International Agencies (for example funds invested for forest protection and plantation, forest products processing) to develop Uplanders' economy.

Introducing these policies in a subsistence agricultural economy moving towards a free market economy requires urgent research on physical, socio - economic and fluctuating market conditions to find the most efficient ways of adapting labour and financial resources for development.

More urgent still is research for planning land uses in forestry. Only by doing this can we make optimal decisions on how to organize land uses in forestry, to mobilize farmers' abilities/resources for well defined investment projects for forestry and Uplands economy development.

1.2 Main requirements for forest land use planning at provincial level under present conditions

By now, planning forest land use should be so well understood that recommendations on the following could be given:

- technically sound criteria for the identification of forest land use forms for either protection, production, or "special use" in forestry.

- on forest lands meant for production, criteria should be provided to help users decide specific appropriate farming systems/practices to be adopted: either extensive production of big-sized timber, intensive production of small-sized timber, or agroforestry practice, land reserve or other land uses, with priorities setting as permitted by the capital/resources available and the urgency to develop national economy.

- promising and appropriate farming models for different forms of land use and systems/practices should be identified for further testing and adoption in the area.

- following analysis of local physical, economic and environmental conditions, technically sound development projects of relevance to the area province should be proposed.

1.3 Background conditions under which the study has been made

To develop the capability of data processing in the forestry sector, since 1980 CFIC has developed and adopted a GIS technology for data processing and map production within the sector, in particular for forest land use.

By now, the technology as developed by the Centre has been gaining the status of an established one, capable of meeting the requirements for forest land use planning.

Under these conditions, in collaboration with *Bac Thai Provincial Forestry Service* and the *Land Use Working Group*, and from October 1992 to August 1993 the Centre has produced a trial planning document for forestry development in "Bac Thai toward 2000". The main objective has been to develop forest land use planning for the Province. This report is made following the results obtained from trials for Bac Thai.

1.4 Main study activities outlined

The main features of GIS technology are to use basic information from maps for comprehensive and systematic data processing. The whole process, therefore, should be carried out in 3 stages, the contents of which can be described as follows:

(i) Collecting base maps and other available information, to be supplemented by additional information of relevance to forest land use planning when required.

(ii) Redressing, collation and systematization of all information in hand so to create a forest map data - base for Bac Thai.

(iii) Transforming the data - base through map overlaying on computer in to a complete set of planning documents comprising forest land use map, forest land farming map and map showing potential forestry development projects to be carried out in the area (below briefly referred to as potential forestry development project map), to be followed by area calculation (using direct and cross methods) from maps and creating a set of statistics showing the areas calculated.

2 Systematic review of land use planning methods used in the forestry sector

GIS technology for forest land use planning as a whole should take advantages of the strengths of all other traditional land use planning methods already used in the sector and be further perfected so to create a comprehensive method based on GIS for improved land use planning.

A brief review of various methods that have been used for forest land use planning in the sector, is given below and compared with the GIS -based method.

2.1 Delphi method for producing forest land use planning maps

Experts are asked to give their recommendations on:

- the selection of criteria for classifying land use types in forestry;
- the production of maps showing various forest categories and zones following the recommended criteria; that of maps showing ecological zones, site quality, main topography, slopes.
- the integration of the above component thematic maps to produce with some degree of selection a harmonized land use planning map (this is sometime a quite difficult job).

2.2 Geography-based analysis method

- Dividing the territory in to basic geographic units (quite homogenous in terms of altitude, slopes, land morphology, edaphic conditions), to be followed by assessment of all elementary conditions in each geographic unit following suitable scales.
- Grouping the basic geographic units based upon land use planning criteria following each elementary condition to shape out land use maps; or classifying the basic geographic units following a general assessment of all elementary conditions, making an analysis and identifying land use types in each class of basic units.

2.3 Combined "delphi and regression models" method

- Quantitatively describing (or scoring) the state of land use on "Component" maps using grids of 1 km x 1 km to assess the effects of altitude, slopes, land morphology and edaphic conditions.
- Field checks by specialists on over 200 sampling plots of the state of land use (using the same scales as above for assessment/scoring); finding out a regression model showing the relationship between land use variables and the "component" variables; checking and repeating the process till a good correlation coefficient has been found.
- Using the regression model found to recommend land use type for all areas within grid, to be followed by delineation of land use boundaries on map by specialists.

2.4 Outlines of GIS-based method aproach to land use planning in Bac Thai

- Preparation of a set of criteria for land use classification in land use planning (referring to various "component" thematic maps available).
- Overlaying and gradual integration of "component" maps using pixcel approach to produce a land use planning map; results evaluation and repeating step 1 when required.
- Integrating land use planning maps with administrative maps to produce land use planning maps following administrative boundaries (as required by the study) to

address various needs in investment planning and in activity monitoring.

Using the GIS-based method for land use planning, we can improve on previous methods in the following ways. We can:

(i) Increase opportunities for making repetitive quantitative analysis for the preparation of improved land use planning maps.

(ii) Facilitate the production of statistics on land uses down to basic management units (forest sub-districts, communes) corresponding one by one to basic units on maps for direct use by planners and development project managers.

3 Approach

The whole process when using GIS-based method for forest land use planning can be briefly described as follows:

- digitizing, redressing and systematization of information from base maps and other information available; collecting missing information when necessary;
- overlaying/analysis of sets of component thematic/base maps for production of forest land use planning maps;
- overlaying/analysis of sets of component thematic/base maps for production of planned forest land farming systems maps;
- overlaying/analysis of maps for the production of maps showing potential/desirable development projects to be carried out in the province (below referred to as potential development projects planning maps).

Below are the main contents of each stage and the results obtained.

3.1 Overlaying maps

The production of planning maps for Bac Thai was done in the following way:

3.1.1 Sets of criteria (as suggested by component thematic maps) for each land use type

(i) Unproductive protection areas of Bac Thai comprise:
- areas with elevations over 1,000 meters asl.
- areas with slopes over 35^0.
- areas with slopes ranging from 25 to 35^0 (as first approach only hillsides are under consideration for local protection)
- areas with extensive limestone mountains, stones and rock covering 75 % of the area or severely eroded phase.

(ii) Productive areas meant for agriculture (KNNN), agroforestry (NLKH) and forestry (LN) development should be identified following the below mentioned principles:

- or non-forested areas, when referring to main topography, slope classes (1).
- for remaining areas: alluvial soils, lands already developed for agricultural farming

should be classified as form lands (NN).
- for water area: unchanged.
- for natural and man-made forests: they are classified as forest lands

3.1.2 Adding Protected Areas to create Protection and Special-Use forests maps

The process is as follows:

- combining maps obtained with other maps showing the protection forests and the protected areas of the province located at the watersheds of Cau and Cong rivers..., trying to find out overlapping areas and others; from these discussions have been made to as certain areas meant for protection and "special-use" forests in the province.
- references have been also made to maps showing rainfalls and to statistics on forest cover on various watersheds, so to find out the right areas for protection and special use.
- summing up the results, we can find that there are 8 types of protection forests as mentioned earlier and 2 types of special-use forests on the maps of the province;

The map obtained shows 10 types of protection and special-use forests. The remaining area of the province is under: productive farm land, production forests and other lands.

Overlaying of sets of relevant component maps to identify areas meant for production, and various types of agro-forest uses.

Processing has been made following the below mentioned steps with maps showing the slope classes, the main topographical features, the protection and special-use forests, the soil classes and the forest types.

(i) Screening out from slope class map and main topography map areas meant for KNNN 20, KNNN 21, NLKH 22, NLKH 23.

(ii) Screening out from slope class map, main topography map and forest map (showing only forested area) areas meant for LN 24, LN 25.

(iii) Screening out from soil classes map areas under farm lands and water.

(iv) Matching 3 sets of maps obtained and maps showing protection and special-use forests to produce land use planning map (with 18 types of land use).

(v) Combining the 18 land use types in to 9 integrated types for land use planning in Bac Thai.

3.2 Results obtained in Forest Land Use Planning in Bac Thai

3.2.1 Forest land use planning maps scaled at 1:100,000 following two types of natural vegetation state (Appendix 3: Forest land use planning maps for Bac Thai)

Maps with 18 land use types as mentioned below have been prepared:

Non-forested	forested	
PH 1	PH 2	Protection forests on limestone mountain
PH 3	PH 4	Protection forests above 1,000 asl
PH 5	PH 6	Protection forests on areas with slopes above 35°
PH 7	PH 8	Protection forests on areas with slopes 25-35°
§D 9	§D10	Special-use forests.
KNNN20		Potential farm land on hillsides
KNNN21		Potential farm land on mountainsides.
NLKH22		Agroforestry lands on hillsides
Non-forested	**forested**	
NLKH23		Agroforestry lands on mountainsides
	LN24	Production forests on potential farm lands.
	LN25	Production forests on lands not suitable for agriculture farming.
NN26		Farm land
CN27		Water area.

- and with 9 integrated land use types:

Special-use forests	°D9
Limestone mountains	PH 1 + PH 2
Strict Protection forests	PH 3 + PH 4 +PH 5 + PH 6
Protection-cum-production forests	PH 7 + PH 8
Production forests	LN 24 + LN 25
Agroforest lands (non-forested)	NLKH22 + NLKH23
Farm lands	NN26
Potential farm lands (reserve)	KNNN20 + KNNN21
Water area	CN27

3.2.2 Sets of statistics showing areas in all forest sub-districts, communes, districts of the province under different forest land uses.

(Appendix 1 - [not included] Statistics showing areas by districts under various land uses and farming systems).

The listing has been made, using cross-statistics from both forest land use planning maps and administrative maps of forest sub-districts, communes so to issue statistics on areas under various forest land uses in the administrative units concerned (forest sub-districts,

commune, district, province).

3.3 Overlaying/analysis of set of relevant maps for production of maps showing forest land farming systems

3.3.1 Methodology used

The production of planning maps for Bac Thai has been completed as follows:

- 49 land forms on land form map scaled at 1:100,000 have been regrouped in to 7 series as follows:
  (30+32+35+37+39+41+43+45+47+49); (8+13+14+17+18+21+22+26); (28+31+36+40+44+48); (9+10+23+24+25+27+38+42); (11+12+15+19+33+34+46); (16+20+29); (4+5+6+7)

- The slope classes from slope class map have been regrouped into: $<12^0$; 12-25^0; and others.
- The present state of forest vegetation has been categorized as:
  (i) mixed forest, rich forests; medium forests
  (ii) poor forests under restoration
  (iii) bamboo forests
  (iv) forests giving non-wood products;
  (v) forest plantation;
  (vi) open lands.
- Forest land use has been classified in to types of : protection, special-use, production, and,
- Main topography in the province has been described in to: mountain-sides and hill-sides.

3.3.2 *Overlaying of sets of maps* to produce maps showing forest land farming systems.

The following steps have been effected:

(i) Listing of planned areas of forests and open lands to be put under various forests land use types and land farming systems.

(ii) Area listing for each land use type and each type of forest land farming systems.
- Based upon land use planning map and forest map.
- Based upon land use planning map and land forms map, and
- Referring to the actual area on maps to rule out too small areas for mapping.
- Then shaping out a final list of forested and non-forested areas to be put under specific land uses and land farming systems (Principles for overlaying II-POII).

(iii) Overlaying relevant maps as suggested by POII to produce maps showing areas under planned forest land farming systems.
- Screening out from land use planning map the areas present for strict protection, protection-cum-production, special-use, product: (on forested lands) and production (on non-forested lands).
- Overlaying/matching maps showing areas for strict protection (?) with maps showing

slope classes ($<25^0$) to produce maps showing areas under PTKD11,12.

- Overlaying/matching maps showing areas for protection-cum-production with forest maps to produce maps showing areas under PTKD 13,14,15,16,17,18.
- Overlaying/matching maps showing areas for protection-cum-production with forest maps to produce maps showing areas under PTKD 19, 20, 21, 22, 23.
- Overlaying/matching maps showing areas for production on non-forested area with main land form maps to produce maps showing areas under PTKD 24, 26, 27, 28.
- Overlaying/matching maps showing areas under PTKD 24 with main topography (mountain-sides and hill-sides) maps to screen out maps showing areas under PTKD 24 and PTKD 25.
- Integrating all the maps obtained, we have produced a map showing planned forest land farming systems (= forest land farming planning map).

The author continues with a technical description of the map overlaying process for Bac Thai Province. It is thought that this work is not of great significance to the general reader, and the tables have been ommitted. For those readers who have a particular interest in the subject, detailed information relating to Bac Thai is available from the author. Detailed analyses of land use can be carried out by the author for all areas of Vietnam.

23 A DISCUSSION AGENDA FOR THE LAND USE WORKING GROUP

by Tariq Husain[1], Consultant, IIED

Organizing a Policy Matrix

As the Land Use Working Group is an inter-ministerial forum for discussion of policy issues, it would be useful to present some ideas on how such discussion could be organized. For this purpose, a simple approach is that of identifying policy targets and policy instruments. From the papers that have been presented, one can identify at least five important policy targets in which Viet Nam could have a major interest. From the experience of Viet Nam and other countries, it is also possible to identify three types of policy instruments for achieving the given targets. Putting the targets and instruments together gives a policy matrix. The matrix of interest to the Working Group can be summarized in simple terms as follows:

	Types of Policy Instruments Available		
National Targets Related to Land Use	Improving the Market Economy	Improving Government Institutions	Direct Support of Households
Land Allocation			
Land Development			
Production and Income			
Land Sustainability			
Social Equality			

The first four targets come straight-away from the first paragraph of the paper given by Tran Khai, Deputy Head of the State Planning Committee, though they are stated above in somewhat different terms. The fifth target is added here to recognize Viet Nam's continuing concern with social equality. Taken as a whole, the policy matrix given above may be considered to represent the areas of concern of both Viet Nam and the international agencies which are supporting it.

A few words on each of the targets and instruments are given below by way of elaboration.

---

[1] The author is an economist and institutional specialist working with Enterprise & Development Consulting (Pvt.) Limited (EDC) in Islamabad. He has assisted and advised the Land Use Working Group on four occasions, since August 1993. This note is based on his verbal presentation at the concluding session of the seminar.

Land Allocation

The allocation of land to households, enterprises, state organizations and foreigners, together with specified rights and obligations, is an ongoing process. It is being managed by the General Department of Land Management, whose Director General, Ton Gia Huyen, gave a paper explaining the 1993 Land Law, relevant policies, and the procedures for land allocation which are being followed by his department. Another national level perspective on land allocation was given in the paper by Le Hong Ke of the Ministry of Construction, who discussed the transformation of agricultural and forest area for urban and industrial uses.

The implementation of the land allocation process at the local level is described by Vu Van Me of the Ministry of Forestry, whose paper gives the example of a whole commune in Hoa Binh Province. Farmer responses to the implementation of the land allocation process are discussed in the paper by Nguyen Tu Siem of the National Institute of Soils and Fertilizers.

It is clear that the task of land allocation, though difficult, will be completed in some time with the administration that has been put in place for this work. International agencies are also assisting in this task. The question for the future is, How can Viet Nam gain the most from the land allocation process? For answering this question, it is important to look at the other targets identified in the policy matrix. The main connection between land allocation and the other targets noted above is through the "327 Programme". This connection can be seen in the paper presented by Nguyen Xuan Vanh of the State Planning Committee, in which the author notes the objectives behind Decision 327-CT of 15 September 1992, and presents some of the results obtained during its implementation; it is also seen by Nguyen Cat Giao, Director of the Planning Department, Ministry of Forestry. Some further discussion along these lines is given below.

Land Development

Once farmers and enterprises are in possession of land, and understand their rights and obligations, they may engage in the process of land development. This refers to the preparation and development of land for specific purposes, such as forestry, agroforestry, fisheries, crop cultivation, etc. As emphasized in the paper by Nguyen Cat Giao, hard work, capital and good knowledge are needed in this process, which is costly and risky. The costs and difficulties encountered by farmers during land development are described in the papers given by the three farmers who wrote papers for the seminar, namely, Pham Hoai Thanh, Nguyen Van Cuong and Nguyen Ngoc Trinh. It seems that some farmers - perhaps the very poor - may not have the patience and resources to develop their newly-allocated land. If this happens, then the very poor will remain very poor, and the benefits of land allocation may also be slowed down.

Some aspects of the situation on the ground can be seen from the paper by Nguyen Van Viet, Director of the Forestry Department of Bac Thai Province, who shows how much progress has been made in his province, and also how much more needs to be done. Some links between land development and technical knowledge are shown in the papers by Marc Langevin of Oxfam (Quebec) and Nguyen Huu Hong of the University of Agriculture Sciences, No. 3, of Bac Thai. The influence of farmer knowledge on land development can be seen in the papers by the three farmers mentioned above, and also in the paper on shifting cultivation by Do Dinh Sam, Vice Director of the Forest Science Institute.

What these papers show is that the methods used for land development affect the economy and the environment, and also social equality. These aspects of land use are further discussed below from different perspectives.

Production and Income

A large part of the benefit of land allocation and land development lies in the contribution of land to production and income. Not all scientists include this consideration in their work. For policy makers and farmers, however, increases in production and income are perhaps the most important objectives, because production and income from land are related directly to human needs - the farmer's needs for food and fodder, timber and fuelwood, and cash.

The paper by Ton That Chieu, Adviser to the Ministry of Agriculture and Food Industry, gives a national perspective on food security; implications of food security for national land use are indicated in this paper. Broader links between human needs (production, income) and land use are shown in the papers by Gunther Mayer of the Viet Nam-GTZ Song Da Watershed Project, Nguyen Tu Siem, Do Dinh Sam, Vu Thanh Mo of the Forest Inventory and Planning Institute and, of course, the three farmers. In general, these papers give the impression that land use is a function of the need for rural households - and for Viet Nam as a whole - to increase their production and income.

A different approach to land use is taken in the papers by Lai Huy Phuong, Director of the Centre for Forest Information and Consultancy, Nguyen Ngoc Nhi, Director of the Centre for Community Forestry Extension and Development, Nguyen Huy Phon of the Forest Inventory and Planning Institute, and the joint paper by Hoang Xuan Ty of the Forest Science Institute and Trinh Duc Huy of the Forest Inventory and Planning Institute. In these papers, the general approach is to make land use plans based on the agro-ecological and physical features of the land, often through some form of GIS application. The paper by Phuong, however, goes further by proposing investment projects for appropriate land uses.

Sustainability

Environmental sustainability through appropriate land use is a major concern of the papers listed in the preceding paragraph. It is also a prominent feature of the papers given by Nguyen Cat Giao, Do Dinh Sam, Nguyen Huu Hong, Marc Langevin and Nguyen Tu Siem. There is a difference, however, between these two sets of papers: the first set of papers assumes that sustainability comes from appropriate land use planning, while the second suggests that sustainability is achieved through appropriate production and land development models. If the qualities of the land are kept foremost, and if planning from above is effective, then the first approach could be followed. If the concerns of farmers and policy makers are to be kept foremost, and if the context is that of the market economy, then the second approach would be more promising. How to combine these two approaches is an interesting question for the future.

Social Equality

This subject was not addressed directly in the papers given at the workshop. It is, however, an important issue for Viet Nam, and for the various aspects of land use. For example, as land development is a costly and risky process, it is possible that poor households may not

be able to develop their new land as quickly as others; then they will certainly fall behind their neighbours even more. It is possible that poor households may not have as much labour, capital, education, knowledge and influence as other farmers. In this case, they will fall behind others, and national progress will also be slowed down. It is also possible that some parts of the country may not be able to move as fast as others; this could create problems at later stages of development. These may be some of the reasons for paying attention to social equality, and for making appropriate strategies for helping poor households.

Instruments for Achieving Targets

After this brief discussion of possible policy targets, it is useful to look at ways in which policy makers can attempt to attain targets. In this connection, useful information and suggestions are found in the papers by Nguyen Cat Giao and Ton Gia Huyen. While there are many specific instruments that could be employed in connection with land use, perhaps the most powerful can be associated with the three types listed above in the policy matrix. These are discussed briefly in the following lines.

Improving the Market Economy

This is one of the main responsibilities of the national government, as it is generally not possible for households, organizations and provinces to influence market conditions (except local conditions). Instruments that are available to policy makers include those that send signals through the market (eg. price policy, trade policy and taxes and subsidies), those that change the legislative framework for operating in the economy and allow new types of markets to be created, and those that open up opportunities through provision of infrastructure (such as roads, electricity, ports, etc.). In each case, the result is that new opportunities are created for households, enterprises and organizations. It is well known that such changes have a profound impact on land use, the land of products that are grown on land, and the kind of protection that is given to land. Although much work has been done in Viet Nam in moving towards a market economy, the impact of market forces and market reform on land use has probably not been adequately researched.

Improving Government Institutions

Much has also been done on this subject in Viet Nam. Examples include: reorganisation and restructuring of organizations; privatization; assignment of new roles and responsibilities; changes in procedures; decentralization and recentralization of certain functions; and so on. Some of the key areas in which perhaps more is needed are: improving horizontal coordination between organisations at each level (for example, between agricultural and forestry organizations at the central and provincial levels); improving vertical coordination and communication between central, provincial and lower levels; and, improving the linkages between the state and the people.

Direct Support of Households

This kind of support may be given through projects or programmes. Its purpose is to help households improve the condition of their resources, including land, capital, knowledge and inputs. Support for farmer organizations is also included in this category. Instruments and

interventions of this type are usually directed at special areas or special groups of people, and for special reasons. The implicit assumption is that instruments available for general use in the countries (such as market-based instruments and the normal programmes of government departments) are not providing as much support as is needed by certain areas and certain groups of people in the country. Most projects, including donor-assisted projects, are formulated as a response to this perception.

Summing Up

The targets and instruments listed above represent many possibilities for action. Even at this stage, considerable importance is being given by the Government of Viet Nam and supporting donor organizations to these matters. It is up to the Land Use Working Group to decide what its priorities might be in terms of the policy matrix illustrated above. One thing, however, should be given due importance: that it is the responsibility of policy makers to make policy, and the responsibility of researchers to find out from policy makers what kind of information and analysis they need. If policy analysis is conducted in this way, then the contributions of the Working Group would become even more valuable for the country in the future.

24 POTENTIAL RESEARCH COLLABORATION FOR THE GROUP WITH UK SCIENTISTS

by Dr Caroline Howard, International Institute for Environment and Development

I have listened to these papers with increasing interest and excitement. Two very clear messages emerge. The first is a success story. The second identifies the way ahead for land use policy, and for the work of the Group.

First, the success story. In his paper Dr Tran Khai stated that the forest cover in Vietnam had increased by 1% between 1991 and 1993. This may seem trivial until it is remembered that all other developing countries in the tropics are reporting annual forest losses of up to 10%. Where does Vietnam's success come from? The answer is given by many contributors to this seminar. They show clearly that the success comes from the policy of land allocation - where people are given rights to land and forest, and where, in response they have accepted responsibility for the protection and management of those lands. Both people and forests have begun to flourish, the people must be credited with the expansion of forests. Their success has been considerably helped by the coupling of technical and financial assistance (capacity building for the land user) to the allocation of land.

Secondly, the way ahead. There are a cluster of new policies, centred on Decision 327, which aim to take forward the greening of the more than 11 million hectares of degraded agricultural land. Generally, this is sloping land where overly intensive cultivation has led to severe erosion and loss of fertility. Land allocation will provide the basic incentive to the farmer to reclaim this land and to attempt to restore its fertility and stability, but technical and financial assistance for the farmer will also be needed.

As a first step, it will be important for scientists in the Group to review existing technology for land reclamation, to identify successful approaches and to determine where new information is needed. Following Professor Hoang Hoe's visit to IIED (London) there is some interest from scientists in the UK Natural Environmental Research Council (NERC) to collaborate with Vietnamese scientists. NERC and the UK Royal Society have commissioned a report to identify potential collaborators in Vietnam, and to outline potential research areas.

It is proposed that the Group work towards setting up a joint research project with NERC, to identify outstanding problems in land reclamation and on the establishment and growth of native timber, and selected other trees, on degraded soils in central Vietnam. The intention would be to develop a simple methodology for tree establishment which could readily be used by Vietnamese farmers. Preliminary work on timber species selection and cultivation has been completed by Professor Hoang Hoe. He identifies 50 potentially useful native tree species, and has published an account of their growth characteristics. The research will also provide information on soil amelioration for farmers wishing to grow perennial crops (other than timber) and will examine natural succession on degraded soils, identifying interventions which could assist the process. During a development phase, a plantation of indigenous trees would be established. Local farmers would be invited to participate, either as employees on the plantation, or by growing trees on their own land under contract to the

investor (State or private). During the development phase of the project, extension cadres could be trained, who would then be in a position to expand the scheme as widely as the Government might wish.

Thank you all for your kind attention. It has been a great pleasure and privilege to be working with you again. I hope our efforts will contribute to a more sustainable future for Vietnam.

APPENDIX I

The Second National Land Use Seminar
Bac Thai, Vietnam
22-23 September 1994

AGENDA

22 September

Morning: Opening plenary

8.30 Welcome address, purpose and objectives of seminar, by Professor Hoang Hoe, Chairman of the Land Use Working Group.

Welcome address by Chairman of Peoples Committee of Bac Thai province.

9.30 Introductory address by Dr Christian Mersmann, GTZ

10.00 Present land use situation and the strategy for using the land from now to the year 2000 by Dr Tran Khai, Deputy Head of the State Planning Committee.

10.30 Coffee / Tea break

11.00 Land law and land management policies by Dr Ton Gia Huyen, Director General of the General Department of Land Management.

11.30 Competing claims and policies for land use, and how to resolve them by Dr Caroline Sargent, Forestry and Land Use Programme, IIED.

Lunch

Afternoon: session on land policies and peoples knowledge

13.30 Renovation of forestry strategy in Vietnam by Mr Nguyen Cat Giao, Director of the Planning Department, MOF.

13.50 Agricultural development and food security, by Dr Ton That Chieu, National Project Manager GCPS/RAS/140/ITA (VIE), Ministry of Agriculture and Food Industry.

14.10 Land management system, land allocation procedures and problems, by a representative of GDLM.

14.30 Land allocation at Tu Ne (Hoa Binh province) by Dr Vu Van Me

14.50 Land allocation at Tien Yen (Quang Ninh province) by Dr Nguyen Ngoc Nhi.

15.10 Tea/ Coffee break

15.30 The role of taxes and subsidies in land use by Mr Nguyen Vanh, State Planning Committee.

15.45 Zoning and regulation of land use in built-up areas and economic zones, by a representative of the Ministry of Construction.

16.00 Cooperation between state organizations and farmer by Mr Nguyen Van Viet, Bac Thai Provincial Forest Department.

16.20 Land use and Household Economy by Nguyen Quoc Hung

16.40 Farmers' experiences and views two farmers from Bac Thai and Soc Son province.

17.30 Close of session

23 September

Morning: Session on practices and procedures

8.00 Some results of integrated land use in Tua Chua District, Lai Chau Province, by Dr Nguyen Xuan Quat, Head of Silviculture Section, Forest Sciences Institute.

8.20 Shifting cultivation in Vietnam by Dr Do Dinh Sam, Vice Director, Forest Sciences Institute.

8.40 Remarks on environment impacts in the areas where land has been allocated, by Dr Nguyen Tu Siem, Chief of Sciences Section, Institute for Soils and Fertilizers.

9.00 Sloping land use experiences by someone from the Bac Thai Agriculture College No. 3.

9.20 Important principles and instruments for equitable land allocation and land use, by speaker from OXFAM QUEBEC / OCSD.

9.40 Experiences from the Da River Watershed Project by Mr Gunther Mayer, Chief Technical Adviser.

10.00 Tea / Coffee break

10.30 Criteria systems and the procedure for land use system identification, by Dr Bui Quang Toan, Director.

10.50 Applying GIS to identify land use proposals by Mr Lai Huy Phuong, Director, Centre for Forestry Information and Consultative, Forest Inventory and Planning

Institute.

11.10 Using PRA to make the land use plan for communes by Mr Vu Thanh Mo, FIPI

11.30 Land allocation and Land management of FDA by Mr Nguyen Huy Phon, FIPI.

11.50 Ecological zoning for number of forest plantation species based on the geographical information system (GIS) on the bioclimatic factors in Vietnam by Dr Hoang Xuan Ty (FSI)

12.00 Lunch

Afternoon

14.00 Fruit trees in home garden at some area by Dr. Prof. Tran The Tuc.

14.20 Major land use issues to be resolved by Dr Caroline Sargent, Forestry and Land Use programme.

14.40 Themes and outline research plan for LWG by Dr Tariq Husain, IIED Consultant.

15.20 Tea / Coffee break

15.40 Impressions and conclusions: possible statements by members of the LWG Steering Committee and representatives of GTZ.

16.00 Closing remarks by Prof Hoang Hoe, Chairman LWG.

16.30 Departure for Hanoi

APPENDIX II

LIST OF PARTICIPANTS

A. Government Officers

1. Prof Tran Khai	Deputy chief of State Planning committee; LWG
2. Prof Ton Gia Huyen	General Director of Land Administration Department; LWG.
3. Prof To Linh	Government Adviser, Government Bureau.
4. Mr Hoang Dinh Tang	Government Adviser, Agro-forestry Bureau

B. Ministry of Forestry

1. Mr Bui Xuan Yen	Director of the International Cooperation Department, Ministry of Forestry.
2. Prof Ha Chu Chu	Director of the Environment and Technology Department.
3. Dr Nguyen Ngoc Lung	Director of the Silviculture Department
4. Mr Nguyen Nam	Vice-Director of the International Cooperation Dept., in charge of the Vietnam - Sweden Forestry Programme, Coordinator.
5. Mr Vu Long	Deputy Director of the FSI
6. Mr Tran Dinh Dan	Expert, Forestry magazine
7. Mr Tran Binh	Vice director of the Planning Committee, MOF
8. Mr Tran Sy Hoai	Expert, International Cooperation Department.
9. Mr Doan Tinh	Expert, MOF
10. Mr Do Nhuan	Head of the Forestry Ministry Bureau.
11. Mr Vu Van Me	FSI
12. Mr Hoai Phuong	Da river Wartershed Project Coordinator.
13. Mr Quang Tan	Interpreter.
14. Mr Vu Thanh Mo	Expert, FIPI
15. Mr Trinh Duy Que	Expert, MOF
16. Mr Trinh Tien Dung	Assistant to SIDA

C. Other Institutions

1. Mr Luong Trung Tien	Editing, Board Head of the Agriculture Publishing.
2. Mr Tran Cong Ta	Expert, Agriculture Ministry
3. Prof Le Trong Cuc	Deputy Director, Center for Resources and Environment, Hanoi University.
4. Ms Hoang Minh Nhat	Reporter, the Voice of VN
5. Mr Nguyen Kim	Expert, Agriculture Ministry
6. Dr Bui Quang Toan	Vice Director of the National Institute for Agricultural Planning.

D. Science and Technology Association union

1. Dr Ngo Duc Minh	General Secretary, Vietnam Forestry Science-Technology Association. (VIFA)
2. Mr Nguyen Van Man	Vice chairman, VACVINA
3. Prof Le Duy Thuoc	Vietnam, Soil Science Association.

E. Bac Thai Province

1. Mr Mai Phuc Toan	Chairman of Bac Thai People Committee
2. Mr Nguyen Van Viet	Director, Bac Thai Forestry Department
3. Mr Nguyen Khanh Quac	Director of the Agriculture College No III, Bac Thai Province.
4. Mr Le Xuan Hung	Director of the Bac Thai Agriculture Department.
5. Mr Nguyen Duc Thinh	Vice Director of the Centre for Agriculture Extension Bac Thai Province.
6. Mr Tran Ngoc Diem	Head of the Technical Section, Bac Thai Forestry Department.
7.Mr Nguyen Van Tien	Vice director of the Technology and Environment Department, Bac Thai province.
8. Mr Tran Huu Van	Chief of the Section, Science-Technology and Environment Department.
9. Mr Nguyen Duc Luong	FIPI Bac Thai
10. Mr Pham Van My	Chairman of Soc Son, District People Committee Hanoi.

F. Farmer Representatives

1. Mr Nguyen Ngoc Trinh	Farmer, Luong Son District, Hoa Binh Province.

G. Land Use Working Group

1. Prof Hoang Hoe	Chairman of LWG
2. Prof Ton That Chieu	General Secretary of Soil Scientific Association.
3. Prof Nguyen Xuan Quat	FSI
4. Dr Nguyen Tu Siem	Vice Director of the Soil and Fertilizer Institute
5. Dr Do Dinh Sam	Vice Director of FSI
6. Dr Hoang Xuan Ty	Director of the Center for the Forest Ecology and Environment, FSI.
7. Mr Lai Huy Phuong	Director of Center for Forestry Information
8. Dr Nguyen Ngoc Nhi	FIPI
9. Prof Tran Thanh Binh	Director of Forestry College
10. Mr Bui Huy Duong	Ministry of Technology and Environment
11. Ms Hoang Hong Hanh	FIPI

International participants

1. Mr Anders Ericksson	Officer of management programme, Sweden Embassy
2. Dr Caroline (Sargent) Howard	IIED
3. Mr Bill Howard	IIED
4. Dr Chis Mersmann	GTZ
5. Dr Tariq Hussain	IIED
6. Dr Francois Obein	FAO
7. Dr Rinville	FAO
8. Dr Van de Paul	Da Watershed Project
9. Mr Paul Barton	PAM
10. Mr Claude	OXFAM QUEBEC/OCSD
11. Mr Marc	OXFAM QUEBEC/OCSD
12. Dr Neil Zamieson	WINROCK, USA
13. Ms Carin	World Neighbour, USA