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SOCIO-ECONOMIC ASPECTS OF TRADITIONAL AGROFORESTRY PRACTICE IN TWO VILLAGES IN VIENTIANE PROVINCE, LAO PEOPLE'S DEMOCRATIC REPUBLIC

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By

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LIST OF ABBREVIATIONS

CUSO	Canadian University Support Organisation
DOF	Department of Forestry
FAO	Food Agriculture Organisation
FIO	Forest Institute Organisation
ICRAF	International Centre for Research in Agriculture
IITA	International Institute of Tropical Agriculture
LSFP	Lao-Swedish Forest Programme
Lao ADB	Lao-Asian Development Bank
Lao PDR	Lao People Democratic Republish
RRA	Rapid Rural Appraisal
SPSS	Statistic Package for Social Science
SALT	Sloping Agriculture Land Technology
SEARCA	Southeast Asia Research Centre Agriculture
TOL	Temporary Occupation Licence
TFAP	Tropical Forest Action Plan
UNDP	Unit National Development Programme
UPM	Universiti Putra Malaysia

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Agroforestry is a general concept for a land management system combining trees and agriculture crops or livestock and it is being practised in a number of ways or techniques. Each of these techniques is adjusted to a specific set of socio-economic factors. Agroforestry cultivators or managers belonging to varying social strata and institutional grouping may practice different forms of agroforestry, even within the same general region. Agroforestry is a traditional practice in almost all of Asia. It has been practised in Laos for hundreds of years. However, it has not been organised and managed in a systematic and scientific manner. This study evaluated the agroforestry practices in two villages in Vientiane, Lao PDR. The objectives of the study were: (i) to describe some agroforestry practices being practised in the two villages, in Vientiane Province, Laos and (ii) to examine the bio-physical and socio-economic aspects in relation to agroforestry practices in the two villages.

The study was conducted through a survey of one hundred families in two villages. Data were collected from two main sources: primary and secondary sources. Primary data were gathered from personal interviews with the head of the household using a structured questionnaire. Secondary data were collected from published reports available at the Department of Forestry, and other published reports by relevant agencies.

The study described some general structural and functional characteristics of traditional agroforestry systems practised by the two communities in the villages. These systems include rice cultivation, home garden, livestock grazing, shifting cultivation and off-farm activities.

The results of the regression analysis showed that the farmers' income from agroforestry activities was affected by age and land size. The income and age relationship shows a quadratic relationship. However, there was no significant difference in income between the two villages. The relationship between the income of farmers from non-agroforestry sources and its determinant was analysed using tobit analysis. The results showed that only the variable education was significant at the 0.05 level. The implication of the results are that the government should consider these factors (age, land size and educational level) when implementing an agroforestry project to increase farmer's income.

Understanding of these traditional agroforestry practices and non-agroforestry activities, as well as the rationales behind their management and income are important consideration towards the development of appropriate agricultural technologies for Lao PDR.

Abstrak tesis yang dikemukakan Senat Universiti Putra Malaysia
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SOCIO-ECONOMIC ASPECTS OF TRADITIONAL AGROFORESTRY PRACTICE IN TWO VILLAGES, VIENTIANE, LAOS

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Perhutanan tani adalah satu konsep asas bagi sistem pengurusan tanah yang menggabungkan pokok dengan hasil pertanian atau ternakan dan dijalankan dalam berbagai cara atau teknik. Setiap teknik ini diubbahsuai dan ianya bergantung kepada beberapa faktor sosio-ekonomi. Pengamal atan pengurus perhutanan tani adalah terdiri daripada berbagai strata sosial dan institusi dan mungkin mengamalkan bentuk perhutanian tani yang berlainan, sungguhpun dari kawasan yang sama. Perhutanan tani telah lama dipraktikkan di samua negara Asia dan talah diamalkan di Laos untuk beratus tahun. Sunggahpun begitu, ia tiak diurus secara sistematik ataupun saintifik. Penyelidikan ini telah mengkaji pengamalan perhutanan tani di dua perkampungan di Vientiane, Lao PDR. Objektif kajian adalah: (i) untuk menggambarkan jenis perhutanan tani yang diamalkan di dua perkampungan di Vientiane, Laos dan (ii) untuk mengkaji aspek bio-fisikal dan sosio-ekonomi ber hubung dengan perhutanan tani di kedua-dua perkampungan tersebut.

Kaji selidik dijalankan ke atas seratus keluarya di kedua-dua perkampungan. Pengumpulan data dilakuan melalui dua cara: data asas dan sekunder. Data asas dikumpulkan melalui temubual bersama ketua keluarga dengan menggunakan soalan kaji-selidik yang berstruktur. Data sekunder pula diperolehi dari laporan-laporan yang telah dikeluarkan oleh Jabatan Perhutanan dan agensi-agensi lain yang berkenaan.

Kajian ini menggambarkan beberapa struktur asas dan kriteria perhutanan tani yang diamalkan oleh kedua-dua komuniti di perkampungan yang dikaji. Sistem ini melibatkan penanaman padi, perkebunan, ternakan, pertanian pindah dan aktiviti bukan ladang yang lain.

Keputusan dari analisis regressi menunjukkan pendapatan para patani yang terlibat dalam perhutanan tani adalah dipengaruhi oleh faktor umur dan saiz tanah. Pendapatan dan umur menunjukkan hubungan kuadratik. Sungguhpun begitu, tiada perbezaan bererti ditunjukkan antara pendapatan kedua-dua perkampungan. Huburgan diantara pendapatan petani dan sumber bukan perhutanan tani pula dianalisis menggunakan analisis tobit. Keputusan menunjukkan hanya angkubah pendidikan telah memberikan keertian pada aras 0.05. Keputusan ini memberikan implikasi bahawa kerajaan hendaklah mengambilkira faktor-faktor ini (umur, saiz tanah dan taraf pendidikan) apabila menjalankan projek perhutanan tani untuk menambahkan pendapatan para petani.

Pemahaman terhadap pengamalan aktiviti perhutanan tani tradisional dan bukan perhutanan tani serta rasional disebalik pengurusan dan pendapatan adalah pertinbangan penting ke arah pembangunan teknologi pertanian yang bersesuaian di Lao PDR.

CHAPTER I

INTRODUCTION

General Background

Lao People's Democratic Republic (Lao PDR) is a small country covering 23.68 million hectares. It is bordered by China, Vietnam, Cambodia, Thailand and Myanmar. More than 80 percent of the land is mountainous and 20 percent is composed of the alluvial plain along the Mekhong river (Tejwani and Lai, 1992). Less than two percent of the land is cultivated (UNDP 1991). Elevation ranges from 200 metres above sea level (masl) in the lowland to about 3000 masl in the north. Sixty percent of the population is found in the lowland areas and the remainder occupy the uplands.

The climatic conditions of Lao PDR are dominated by tropical monsoons, with distinct dry and rainy seasons. Eighty percent of the annual rainfall occurs from May to October; the amount varies from 1,400 mm to more than 3,700 mm. The annual average temperature is about 26°C. Relative humidity ranges from 70 to 85 percent throughout the year.

Lao PDR is located in the Indo-Chinese subregion of the Indo-Malaysian realm. It contains parts of two bio-geographic zones, unit 5 (South Indo-China and Annam) and unit 10 (Indo-China). These are sub-divided into four biotic provinces. Sub-unit 5 (Annam) covers the Annam Trung Son mountain chain along the Vietnam border. The central Indo-China sector (sub-unit 10) covers the tropical lowland plains along the Mekhong river basin. The northern hilly, sub-tropical portion of the country is included in sub-unit 10b (Northern Indo-China Sector). A small portion of the northern tip of Phongsaly Province is in the Indo-China Transition Zone (Sub-Unit 10c--montane temperate). Ten of the original 17 vegetation types recognized for the Indo-Chinese Sub-region occur within Lao PDR.

Three major ethnic divisions, based on locations, are recognized in Lao PDR. The Lao Loum makes up the majority of the population (55 percent) and inhabits the lowlands. The Lao Theung comprises about 34 percent of the total population and live on mountain slopes in the middle altitudes. The Lao Soung constitutes about 10 percent of the population and occupy the high mountain slopes. Each of these major groups is sub-divided into ethno-linguistic groups: Lao Loum(17); Lao Theung(34) and Lao Soung(17). In all about sixty-eight major groups are acknowledged.

Agriculture is the main land-use in Lao PDR. About 90 percent of the cultivated land is devoted to producing glutinous rice and about 60 percent of this is grown in the lowlands (Souvanthong, 1994) and depends on rainfed irrigation. Thirty-seven percent of the rice is produced under shifting cultivation, which is the major forest-based agriculture system (Tejwani and Lai, 1992). It is estimated that over

350,000 families practice some form of shifting cultivation. Shifting cultivation is also said to be the main cause of the destruction of some 3,500 sq.km of forest each year (Kingsada, 1990).

Each of the major ethnic groups has different agricultural practices. In general, the Lao Loum practices lowland paddy agriculture, where crop diversification is low. The main crop is glutinous rice produced under rainfed condition. In a few areas (primarily Savanakhet and Vientiane plains), they plant a second irrigated crop. The Lao Loum raises cattle, buffalo, pigs and poultry. In addition, they have small home gardens and fish ponds.

In recent years, with increasing population pressures on the lowland areas, the Lao Loum migrated to the upland areas. In this move, they use the lowland agriculture production methods. Under lowland management schemes, fallow cycles are reduced significantly and soils have less time to rejuvenate. Productivity degenerates rapidly. The Lao Theung traditionally practiced shifting cultivation. They use a large number of fields with a relatively long fallow period (5-15 years). Although upland rice is the main crop, the Lao Theung cultivates other crops such as maize, beans, cassava, and chili. They use several methods to enhance productivity of the land and improve the fallow. For instance, tree stumps are left in the field and allowed to regenerate during the fallow. Some vegetation are left on the fields to help protect the soils.

The land-use system practised by the Lao Theung in Southern Lao PDR is thought to be relatively sustainable (Souvanthong, 1994). In the north, larger areas are available but productivity is lower. Population pressures are greater in the north and fields are completely cleared to allow for maximum crop cultivation. Fallow land regenerates with grass (*Imperata spp*) and bamboo rather than trees. In addition, the topography is much steeper in the north and clearing of fields leads to excessive soil erosion.

The Lao Soung occupies the highest elevations. The topography is very steep, soils are shallow and the fertility is very poor. Vegetables, upland rice and maize are commonly planted, while poppy is the major cash crop. Cotton is also grown for production of garments. Typically, Lao Soung is semi-nomadic, moving to new areas when the fertility of cultivated land no longer yields sufficient products.

Forestry is the next major land use system in Lao PDR. According to a 1991 FAO Country Information Brief, about 47 percent (11.3 million hectares) of the country was covered with forest. This figure was generated by a 1981 study funded by the Soviet Union and reported in the TFAP report for Laos (1990). A subsequent study estimated a net loss of forest cover from 1982-1989 to be about 67,000 ha per annum. If this estimate is accurate, Lao PDR has lost over 804,000 ha of forest since the Soviet study was conducted.

About thirty-five non-governmental organizations are working in Lao PDR. with at least a dozen involved in rural development agriculture. A few have started

small-scale agroforestry projects. Most of the projects focus on alley-cropping for erosion control. Other non-government organizations focus more on environmental and social issues.

Problem Statement

There are several reasons why agroforestry in the Asia-Pacific region has emerged as one of the most appropriate forms of land use in recent years. One reason is the deteriorating land-man ratio in the region which contains 69 percent of the world's agricultural population, but only 28 percent of the world's agriculture land. Consequently, the per capita availability of agricultural land in the region is only 0.27 hectares as compared to 1.64 hectares in some western countries. About two million hectares of forest are cleared annually in the region of which 75 percent is used for agriculture (Rao and Macdicken, 1991). With the destruction of forests and depletion of the fertile top soil, this land is rendered unproductive. The high ecological and social costs of land degradation have therefore become a major concern of some governments in the region. These are the reasons which led to renewed focus by the government on land use system such as agroforestry.

In 1940, the estimated total forested area in Lao PDR was 16.5 million hectares or 70 percent of the total land area. The total forest cover was reduced to about 11.6 million hectares or 49 percent in 1982. The forested area has slightly decreased in the late 1980's and early 1990's. It is estimated that the forest cover is now about 11.3 million hectares or 47 percent the total land area of the country.

A large proportion of the forest is in varying stages of degradation and the forest area is continuously declining. At present, illegal logging takes place at approximately 200,000 hectares annually. Shifting cultivation in Laos accounts for the majority of this area. The decreased forest and degradation of forest resource are a cause of serious concern to the Lao government.

In 1989, the government convened the first national forest conference to address the problems of forest destruction in the country. The resolution of the conference stressed the need for managing the remaining forest area on a sustained yield basis and for rehabilitating degraded forest area through agroforestry and forest plantation establishment.

The number of the Lao people engaged in shifting cultivation is estimated at about 40 percent of the total Lao population in the country (4.5 million). The Lao population, especially the farmers in the rural and remote areas, are familiar in practising traditional agroforestry and traditional shifting cultivation is one form of agroforestry. In order to implement the government policy on improving the living conditions, the rural communities must be incorporated in the forestry sector through forestry and agroforestry activities.

Justification of the Study

Traditional agroforestry has been practised in some parts of the country but it is not called agroforestry. Some call it a farming system, or agriculture system, but all of them are agroforestry such as agrisilviculture system, and agrosilvopastoral system. Therefore, this study is needed in order to provide some information on the agroforestry systems as practised in the country.

This study could be used as a guideline for land use planning in the country. The outcome of the research may be useful for the planner, policy makers and managers to be more familiar with agroforestry development. The study may also be helpful in understanding the problems in agroforestry development and help formulate future strategies for sustainable land development, specifically in the Vientiane Province.

Scope and Objectives of the Study

The study aims to investigate the patterns and extent of the traditional agroforestry systems that are being practised by local farmers in two villages in Phonhong District, Vientiane province, along with the associated problems and constraints caused by the traditional agroforestry practised on land use and land tenure. The main

emphasis of this study is placed on the traditional agroforestry in the two villages, Ban Maiphosy and Ban Nongkhon which were selected to represent the traditional agroforestry practice in the country.

The specific objectives of the study are to:

(i) describe some agroforestry systems being practised in Vientiane province, Lao PDR and

(ii) examine the bio-physical and socio-economic aspects in relation to agroforestry practices in the two villages.

CHAPTER II

LITERATURE REVIEW

Definition of Agroforestry

Agroforestry is a land use system that is increasingly regarded as a cost- effective mean of reducing the degradation of marginal agricultural land and increasing the productive capacity of agricultural ecosystems by enhancing soil fertility, controlling erosion and improving the microclimate (Chuntanaparb and Mac Dicken, 1991). There are various definitions of agroforestry. For example, Nair (1984) defined agroforestry as a land-use system that involves deliberate retention, introduction or mixtures of trees or other woody perennial in crop/animal production fields to benefit from the resultant ecological and economic interactions. According to Bene (1977), agroforestry is a sustainable management system for land that increases total production, combines agriculture crops, tree crops and forest plants or animals simultaneously or sequentially, and applies management practices that are compatible with the cultural practices of the local population. Hocking (1991) defined it as a set of land use systems that combine trees with pasture, arable crops, and /or animal production on the same land-unit, either simultaneously or in short sequence.