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APPLICABILITY OF FORESTRY TO INFERTILE UPLANDS OF NORTHEAST THAILAND

by

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เรื่องย่อ

ข้อเขียนนี้รวมสาระสำคัญของงานวิจัยการใช้ที่ดิน งานวิจัยการปลูกป่าหมู่บ้าน และงานวิจัยระบบการเกษตรน้ำฝนในภาคตะวันออกเฉียงเหนือ เนื้อเรื่องได้กล่าวถึงประชากร สถานะทางเศรษฐกิจ ข้อจำกัดต่าง ๆ ทางกายภาพ และสถานภาพของป่าไม้ในภาคตะวันออกเฉียงเหนือ และได้ให้ความเห็นจากประสบการณ์ในงานวิจัยเกี่ยวกับรูปแบบของการทำการเกษตรโดยปลูกป่าพร้อม ๆ กันไปด้วย

ABSTRACT

This article encompassed the essences of research results of The Land Use Project, The Pilot Village Woodlot Project, and The Rainfed Farming System Project in the northeast. The subject elaborated the northeast population including economical condition, constrains in its physical factors and status of forestry practice. Suggestions, from research experiences, were also given on the practical means of integrating forestry in to upland farming system of the northeast.

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INTRODUCTION

The 16 provinces of Northeast Thailand cover some 168,854 sq.km. (ca. 1/3 of the countrys land area), most of it in subsistence agriculture. Until recently some 30,000 sq.km. was regarded as forest ; since the analysis of satellite imageries, however, this area has been reduced to 25,886 sq.km. (1982). Although containing one third of Thailand's population and with the highest population growth rate (2.9%) of any of the 4 regions, the N.E. share of national GDP was only about 20% in 1980 and falling. Per capita income is about 30% of that of the Central region (including Bangkok), 45% of that of the south and 60 % of that of the North. It is only within the last two decades that communication development within the N.E. has enabled economic integration with the commercial center of Thailand. While, socially and politically, the region is still remote from Bangkok, when modern development began (with improvement in communications), it heralded drastic changes ; urban growth was rapid and later establishment of major military bases stimulated migration into towns ; the introduction of crops increased land hunger, and the (often punitive) mortgaging of land and production to affluent city dwellers created social pressure not previously experienced ; encroach upon forest lands for agricultural development accelerated to the point where it is now impossible to locate accessible areas of any size free from settlement. Urban unemployment is high (and increasing) and agricultural development affects 30% of the available labour supply between planting and harvest. Health and educational services lag well behind the rest of Thailand and there are massive differences between urban and rural facilities. Thus, disparities between N.E. and the other regions of Thailand are parallelled by contrasts within the region in population, in culture (e.g. Thai/Laos and Thai/Kmer etc. differences), in climate, in ecology and lifestyle.

The soils of the N.E. are generally poor. The General Land Capability Map of Thailand recognises 9 major land categories based on soil, and assesses their potential for increased agricultural production. The types with "high" or "moderately high" potential are virtually absent from the N.E., and even the forested areas rate only a classification "moderate" or "low". Fast expansion of cultivation and the extension of grazing will, inevitably, be at the expense of forest land and will be extensive rather than intensive because

of the generally poor soils and primitive techniques. Such land forms aconstantly diminishing regional perimeter.

Rainfall distribution is extremely variable, as is the occurrence of drought. Thus, the number of total drought days (May – June) varies from 13.3 in Khon Kaen province to 21.1 in Srisaket. Maximum continuous drought days range from 11.2 in Udon Thani to 45.3 in Korat.

These features of the region are all well known and well documented. Of particular relevance in the present context are the mounting land hunger and forest encroachment, and increasing unemployment and falling incomes. They highlight the importance which require immediate land–use planning.

The growing pressure upon forest land is graphically illustrated in various papers by the Mekong Committee. Based on ground surveys supplemented by LANDSAT photography, the papers indicated the "quasi complete destruction of natural vegetational cover", to widespread annual flooding particularly in the Nam Mun valley–and to the limited production potential of the generally poor soils of the region. With a population growth rate of 2.9 % (implying a doubling in 25 years) and the fact that all arable land (as well as many marginal and submarginal areas) is now taken up for agriculture, there is no hope for large–scale forestry development. It is now critical to improve land–use and seek new approach to identify, maintain and manage upland watershed.

PAST/PRESENT FOREST SITUATION OF N.E. THAILAND

The N.E. the biggest region of Thailand, with the second greatest forest area in the past (1961), in 1982 has the lowest percentage of land under forest. The periodic changes are drastic in 1973 the forest area was 50,671 sq.km (30 %) of the land area, in 1978 the forest area was depleted to 31,221 sq.km (18.49 %), and in 1982 went down to 25,886 or 15.33 % of the total land area (Wacharakitti et. al. 1984). These dramatic changes due to many pressures such as land encroachment for cash crops planting, land settlement, mining, over exploitation, illicit cutting, construction of hydroelectric dams, and construction of highways.

In the past (1970), the average consumption of fuelwood per capita was estimated to be 1.23 m^3, with the highest consumption in the Northeast.

Since the forest area is depleted to less than 15% of the land area at the present, Therefore, it is believed that the shortage of fuelwood both in the urban and rural areas would be imminent in the very near future. The fuelwood is one of the basic needs of the rural poor villagers, specially those who live in the remote areas.

EXISTING FORESTRY PRACTICES ON UPLATD AREAS

The existing forestry projects practiced on upland areas of N.E. Thailand are mostly operated by the Royal Forest Department (RFD), Forest Industry Organization (FIO); which are the government agencies. Only small scale of forest plantation in the N.E. operate by private sectors. The existing forestry projects are divided into categories as follow :

1. Reforestation Project. The reforestation project of the Royal Forest Department practices in 16 provinces of N.E. Thailand. Fifty four reforestation units has been established by the Royal Forest Department. Upland areas, specially watershed catchment areas were replanted with Teak (*Tectona grandis*), and hardwood species such as *Pterocarpus macrocarpus, Dalbergia chochinchinensis, Xylia kerrii, Dipterocarpus alatus.* Since these species grow slowly, so they are replaced by the fast growing species *Gmelina arborea, Azadirachta indica, Melia azedarach* and Eucalyptus species. The total planting areas of 54 reforestation units from the beginning up to present (1983) are 30,439 hectares. The operation of the reforestation activities is solely conducted by the forest officers from the RFD and FIO perssonel. Villagers are hired on a daily basis, This operation brought out the people idea of only that the forest plantation belongs to the Ropal Forest Department, not belongs to them or public.

2. Reforestation Project of Watershed Area. This project is carried out specially on highland area where the forest were seriously cut. The operation of this reforestation project is alike the former project operation which is that the villagers nearby were hired as a daily labors. They do not have a sense of belongings. The total planting areas up to present (1984) are 8,431 hectares.

3. Reforestation Project to Rehabilitate the Deteriolated Forest Area. This is the special project conducted over the country. The purposes of the project are to rehabilitate the denuded areas of the high and uplands. But the operation of the project practice is the same as the two projects that is villagers are

hired as daily labors, no sense of belongings. The total replanting areas of this project is 22,320 hectares.

It is often happened that the people disagreed with reforestation operation. Sometimes, they react as the protestants by pulling the seedlings out, burning the forest plantation and burning the reforestation unit.

4. Right to the Tillers in the Reserve Forest Project. The Royal Forest Department recognizes about the failure of the reforestation projects as aforementioned, and trying to modified the Forest Village System of the FIO and starting the project called "Right to the Tillers in The Reserve Forest". This project has been started 3 year agos. The purposes of the project are mainly to stabilize the people in the area by grouping the people who practice cultivation in the reserve forest. The grouping and land reallocation is publicized to the sub-district council and villagers. The project starts after the agreement of those people concerned. The concept of the Right to the Tilleers is that the local landless villagers having privilege to appley for the certificate of right for cultivation. After that land allocation is conducted by means of 2.4 ha. per houshold, that they can use for housing lot and cultivated area. This plot of land they have a right to use for cultivation till their younger generation, but they can not use for sell nor mortgage, and change the right to other families. Some basic infrastructures are established by the Forest Department, for example road, pond, reservoir, water piping system etc. Since, this modified right to the tillers has been recently practiced the advantages and disadvantages are still unknown. The study of impacts of the right to the tillers project practiced all over 4 regions of Thailand will be conducted by the Faculty of Forestry with the collaboration of NESDB.

TREND OF FORESTRY PRACTICES ON UPLAND AREAS.

Experienced from their older generation the people in N.E. Thailand encroach the land and even practiced shifting cultivation by leaving some standing trees on their farmland. Those trees left behind are directly benefits to them (rural people) and livestocks as shelters, food (fruit, leaf, and flower), medicine (bark, leaf, root, fruit, heartwood and flower). Therefore, the introduction of tree species will be planted on upland areas has to be also considerd about the local uses. By this means, the tree planting has to serve social benefits.

At present the word "social forestry" or "community forestry" are commonly used. In principle a social forestry is an approach that involves local participation in forestry activities to meet the loal needs. Community or social forestry has been defined by FAO as any situation which intimately involved local people in a forestry activity. It embraces a spectrum of situation ranging from woodlots in areas which are short of wood and other forest products for local needs. Though the growing of trees at the farm level provided cash crops and the processing of forest products at the household, artisan or small cottage industry level to generate income to the activities of forest dwelling communities. It excludes large scale industrial forest plantation and any form of forestry which contributes to community development solely through employment and wages, but it does includ activities of forest industry interpries and public forest services which encourage and assist forestry activities at the community level. The activities so encompassed are potentially compatible with all types of land ownership. While it thus provides only a partial view of the impact of forestry on rural development, it does embrace most ot the ways, in whieh forestry and goods and services of forestry affect the lives of rural people (FAO, 1978).

From the definition above it is cleared that the beneficiaries from social forestry are local population. either rural population or forest dweller.

As mentioned earlier that the N.E. of Thailand has lowest forest area in the country (less than 15% of the land area at present) coupled with its physical factors; such as soils are poor and water are less specially in dry season. Thus, tree planting is urgently needed as a source for fuelwood, food and other uses. Tree planting on the high and upland areas provided not only the direct benefits to the rural people but also indirect benefits, like, a watershed catchment area, protect soil erosion, recreational area and so on. The significane of tree planting is as a major potential source for contributing to long-term need of effective resource management. It has benefit to the development of the rural area in general both in socio-economic and environmental point of views.

So then the trend of forestry practices on upland areas of N.E. Thailand has to be modified to the social forestry activities at a small scale like farm woodlot, village woodlot and tree farming which is directy benelfits to rural people.

A pilot village woodlot was established in 7 provinces ; Khon Kaen, Roi Et, Kalasin, Mahasarakam, Yasothorn, Srisaket and Surin by different planting model form the past, such that the village woodlot of Yasothorn was conducted through the sub-district council. The villagers participate in the project since the begining from preparation of nursery for seed germination, transplanting into plastic bag, planting seedlings on public area, maintenance of the forest plantation the whole process of reforestation the villagers has a major role and having a sense of belongings. *Eucalyptus camaldulensis* is the selected tree species for this purpose. This tree species proved to be a promising species in northeast Thailand. It can grow very well both lowland, upland and highland. It can also stand in the arid, saline and swamp areas. For example, the pilot woodlot *Eucalyptus camaldulensis* plantation of Ban Lao Khao, at Thung Kula Rong Hai, Roi Et province is a very successful case, because that area is a sandy soil and very dry, but the plant of *E. camaldulensis* in 2 years grow up to average height of about 2–3 m. (Wacharakitti et. al., 1984 (Intercropping cash crops like cassava in the forest plantation has also been practiced in each province. Results show that this agro-forestry prove to be applicable to uplands farming because both of trees and cassava grow well Farmers earn extra income from cash crop while waiting for the tree crops. The study shows that if the spacing is 4 × 4 m., the cash crop planting can practice up to 3–4 year. The promising crops are upland rice, mung bean,. peanut, corn, cassava, sugar-cane, castor seed, papaya and chilli (Petchmark, 1984).

PRACTICAL MEANS OF INTEGRATING FORESTRY INTO UPLAND FARMING SYSTEM

Agro-forestation is a practical means of integrating forest activity into upland farming system. Agro-forestry is a system of land management where by forest and agricultural products are produced on appropriate and suitable areas simultaneously or sequentially for the social, economics and ecological benefits of the community. This approach to forest occupancy management seeks to stabilize shifting cultivators by managing them in forest lands, in contrast to resettling them in lowland agricultural areas. Other combination is a pastro-forestation, which a system of land management where by forest and livestock grazing are combined after certain period of tree planting 2–3 year.

As an improvement over the traditional farming technology used in upland areas, agro-forestation seeks to achieve simultaneously the following general objectives :

1. to create harmony between natural resource conservation and production.
2. to lessen the gap between food, water, and wood supply and demand.
3. to implement land use scheme that is based on ecological, sociological, demographic consideration ; and
4. to prevent further forest destruction.

Agro-forestation is therefore primarily a resource conservation strategy which is premised on the multiple use of the uplands. As such, it is expected to produce the following outputs :

1. increased forested area and wood production
2. increased production of agricultural crops and livestock
3. improved socio-economic conditions of the farmers.
4. stabilization of forest occupancy
5. improved soils and other environment.

Promising Tree Species on Uplands Farming of The N.E.

The promising tree species on upland farming system of the northeast of Thailand are :

1. *Eucalyptus camaldulensis* (exotic tree)
2. *Azadirachta indica*
3. *Melia azedarach*
4. *Gmelina orborea*
5. *Pterocarpus macrocarpus*
6. *Xylia kerrii*

Promising Cash Crops for Agro-Forestation on Uplands

Evidence from the study of Petchmark (1984) the promising cash crops of Srisaket province are cassava, upland rice, peanut, mung bean, corn,

sugar–cane, castor seed, papaya and chilli. These field crops will probably applicable on upland areas of northeast Thailand.

PROBLEMS IN ADOPTION OF TREE PLANTING IN FARM

Problems encounter in adoption of tree planting in farm and agro–forestation are as follow :

1. farmers do not know what tree species to be planted.
2. farmers have no idea how to get tree seedlings.
3. farmers do not know how to prepare tree seedlings.
4. farmers do not have enough capital for agro–forestation.
5. farmers lack of silvicultural background.
6. lack of forestry extension to rural people
8. marketing of tree crops is uncertained,

CONCLUSION

It is recognized that social forestry in terms of farm woodlots, village woodlots, community woodlots of small scale and with the participation of the rural people are the applicable means of integrating forestry into upland farming system. Adoption of these small scale woodlots even on their farmland, in temple, school and public lands will change the social attitude toward the believe that those forest woodlots belong to them or to public. In other word the social have a sense of belongings. Thus, they will utilize and conserve those woodlots themselve, with the supervising of the local forest officer.

It is also recommended that agro–forestry system, which is a system of land management where by forest and agricultural products are produced on the appropriate and suitable area simultaneously or forestry and livestock raising, a practical measures of integrating forestry into upland farming system in the Northeast.

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