

Thesis Title	Study of Farming Systems for Sustainable Development : Suitable Cropping System and Cropping Patterns for Mooban Bor Maung Noi and Huay Nam Pak, Tumbon Sangpha, Nahaew District, Loei Province.
Thesis Credits	12
Candidate	Mr. Sakehai Wattanasrirungkul
Supervisors	Assoc. Prof. Dr. Morakot Tanticharoen Asst. Prof. Dr. Sudarut Tripetchkul
Degree of Study	Master of Science
Department	Natural Resource Management
Academic Year	1999

Abstract

The objective of this study was to suggest suitable cropping systems and cropping patterns for two villages of Loei Province (Ban Bor Maung Noi and Huay Nam Pak) in northeastern Thailand. The research was conducted at two levels. First, at a general or area-level, the goal was to determine which available cropping systems and cropping patterns were most suitable. The goal of the second level was to analyze individual farmer preferences, and together with results from the first part, recommend specific crops for each family in the two villages. Area-level suitability was based on four factors: 1) physical factors (such as distance to water, topography, climate, and soil fertility), 2) biological (primarily physiological requirements of available crops), 3) farmer preferences (based on local farmer's knowledge/experience), and 4) socio-economic factors (such as market demand, cost of production, etc.). Through a series of questionnaires, experts from governmental agricultural agencies and, local and national universities were then asked to weigh the relative importance of each factor. These weights were then applied to find the most suitable cropping system and cropping patterns through the use of multiple criteria decision making (MCDM).

Results from the first part of the study suggested that an integrated farming system (mixed cropping) using mixtures of 2, 3, or 4 crop types (fruit crops, field crops, vegetable crops, or

floriculture crops) would be most suitable for the study area. The results also suggested that for each of these species groups there were 3, 7, and 13 highly suitable cropping patterns respectively. Most of the highly suitable, mixed cropping patterns of the two species groups were either a combination of fruit crops and field crops or fruit crops and vegetable crops. For the three-crop option, the highly suitable cropping patterns were a combination of fruit crops, field crops, and vegetable crops. The highly suitable mixed cropping patterns for the four crop option was a combination of fruit crops, field crops, vegetable crops and floriculture crops.

In the second part of this study the results suggested that suitable cropping patterns for each family depended primarily on market demand. Farmers in Ban Huay Nam Pak preferred to grow crops with low investment costs. The farmers in Ban Bor Mueng Noi preferred crops that had shorter planting periods and an earlier harvest dates. Based on various physical and socio-economic factors, i.e., distance to water, slope, transportation, availability of labor in the family, and availability of agricultural technologies, approximately 37 crops for Ban Bor Maung Noi and 30 crops for Ban Huay Nam Pak could be grown successfully.

The families could then be divided into groups based on their particular constraints (both physical/topographic as well as socio-economic). Families in Ban Bor Mueng Noi could be divided into 4 groups while Ban Huay Nam Pak, could be divided into 5 groups. For Ban Bor Mueng Noi, Group 1 had no limitations; Group 2 was limited by transportation and availability of agricultural technologies, and these could grow fruit crops, field crops, vegetable crops and floriculture crops. Group 3 was limited by water resources, and Group 4 was limited by water resources, slope and availability of agricultural technologies. For Groups 3 and 4, fruit crops, field crops and vegetable crops were suitable. In Ban Huay Nam Pak, Group 1 was not limited; Group 2 was limited by availability of agricultural technologies. Group 3 was limited by water resources and transportation, and Group 4 was limited by water resources, transportation and availability of agricultural technologies. Fruit crops, field crops, vegetable crops and floriculture crops were suitable crops for these groups. Group 5 was limited by water resources, slope, transportation and availability of agricultural technologies. For this group, fruit crops, field crops and vegetable crops were suitable.

When the crop types were overlaid within a geographic information system (GIS), due to locational and other socio-economic constraints, the number of suitable planting systems was reduced. Four crop systems for Group 5 (Ban Huay Nam Pak) and Groups 3 and 4 for Ban Bor Mueng Noi decreased from 13 patterns to 10. This decrease was due to the exclusion of floriculture crops, which were found to be unsuitable for these groups primarily. When the suitable cropping patterns based on farmer preferences for each family were added to the analysis the number of suitable mixed cropping patterns decreased to 1 or 2.

In summary, this decrease in the number of potentially suitable cropping patterns will make it easier for government workers to advise farmers and farmers to choose proper cropping patterns for use in their lands.

Keywords : Mooban Bor Maung Noi / Mooban Huay Nam Pak / Cropping System /
Cropping Pattern / Physical Factor / Biological Factor / Farmer Preference Factors /
Economical and Social Factors / Limitation of the planting area