Transformation of Cropping Pattern towards Appropriate Land Use
- The Case Study in Vinh Bao District, Hai Phong Province, Vietnam -

Bui Nghi* · Tsuji Masao**
(* Graduate School of Kyushu University · ** Kyushu University)

I Introduction

Appropriate utilization of land resources on the basis of appropriate cropping pattern application not only helps improve the farmer’s income, but also leads to a gradual transformation of self-sufficient and monocultured production into market-oriented production.

The transformation of the cropping pattern also helps eliminate backward living and cultivation practices in rural areas, and initially addressing the problems of farmer’s poverty and directing the rural and agricultural development.

II Objectives of the study

Analysis of main issues for appropriate agricultural land use in the aspects of land area, land quality, methods of land utilization, forms of cropping pattern and alternate cropping pattern in the study areas.

III Selection of the Study Areas

A survey on agricultural land use and cropping pattern application has been conducted in three typical communes: Vinh Long, Vinh An and Tran Duong covered of 30 households, and 10 in each commune with total of 319 plot of land in Vinh Bao district. Because agricultural land area was equally allocated to farmer household, so every household they have all kinds of land with good and bad conditions, high, medium and low positions. This data was not only representative in the district in particular but also in the Red River Delta in general. Using the slice-based method, (fig. 1) Four areas used for agricultural production have been defined, namely high land, medium land, low land, and hollow land.

1 Situation of Land Use in the District

The situation of land use in district from 1995 to 1997 is shown in the table: 1. Land use during that period was still waste, the total area of unused agricultural land was high, (831 ha out of 12,700 ha of agricultural land). Although the total area of agricultural land has been stable or increased very little from 66.8 % in 1995 to 70.0 % in 1997, but the considerable improvements have been made in the structure of land use. Until 1995 there had been no land used for 3-crop cultivation, but in 1997, 572 ha of agricultural land were used for 3-
crop cultivation. On the other hand, the land area for of one-crop cultivation decreased from 970 ha in 1995 to 687.4 ha of the total rice cultivated land in 1997. Measuring for the area of annual crops cultivated only, the land use ratio has been increased from 170% in 1995 to 200% in 1997.

2 Cropping Patterns in the district

(1) Cropping Patterns in the High Land

The main physical feature is characterized by sandy soil with thin cultivation layers, infertility, acidity and extremely poor phosphate and potassium content. Auxiliary food crops and dry crops are commonly used for cultivating in the high land like: peanut, soybean, sweet potato, cassava...and so on.

There are four cropping patterns applied in this area. (fig.2)

The disadvantage of this type of land to crop cultivation is the problems of water falling and land erosion.

The survey indicated the average of households applied the (High land Number 3) HL3 pattern was 19.4%, 39.1% applied the HL2 pattern, 30.0% applied the HL4 pattern and 11.5% applied the HL1. (table 2)

(2) Cropping Patterns on Medium Land

Medium land has many advantages over other types of land. Its system of irrigation works is relatively complete and is able to irrigate 60-70 % of the cultivated area.

The cropping pattern is characterized by transformation of 1 or 2-crop cultivation into 3 or 4-crop cultivation.

There are seven cropping pattern applied in this area. (Fig.3 and share’s area for each cropping pattern has shown in table 3). Most households apply three traditional cropping pattern, i.e. ML3, ML4 and ML6.

Of the surveyed areas, Tran Duong is the place where the area under ML1 is the highest (20.5 %). One of the reasons for this is that adequate and timely irrigation is ensured in the commune.

Although the ML1 alternate farming was first introduced ten years ago, it is still an advanced pattern at the moment because it makes full use of natural resources, brings about high economic efficiency, and is highly effective for environmental protection. However, the pattern has certain limitations such as: Highly seasonal and highly risky, Required adequate and timely irrigation and required big capital.
The area under MIA pattern has a large share in the total cultivated medium land. This pattern has many advantages: the season is not tense, it provides nutrients to the cultivated land and helps improve land fertility. Particularly, the potato crop helps improve the economic efficiency of the pattern as a result of its high price in the beginning of the harvest season. However, the disadvantage of the pattern is that it requires big capital, adequate and timely irrigation and good technique of potato seed preservation.

The area under ML6 pattern is the largest compared to all other alternate-cropping pattern (33.4%). This is a traditional long-standing pattern that has been repeatedly improved to become one of high economic efficiency. The advantage of the pattern is that it can be easily introduced (or it does not require complicated cultivation techniques), requires small investments, not risky and conducive to protection of land ecological environment. However, so far the pattern has still been regarded as economically inefficient because the price of peanut and sweet potato is low and difficult to be marketed.

The area under ML7 is the smallest and the pattern is applied by only a small numbers of households are specialized in soybean and vegetables seeds. In fact, this farming pattern is efficient in two aspects, economic and environmental protection.

(3) Cropping Patterns on Low Land

There are three cropping patterns applied in this area. (Fig. 4 and share of area for each cropping pattern has shown in table 4). The low land is usually used for 2 or 3-crop rice cultivation. At present, auxiliary food
crops cannot be cultivated on this type of land. Ten years ago, most of the land was used for summer rice crop cultivation. So that, the utilization efficiency of this type of land can improve or not, depends on how efficiently the flood drainage can be addressed. The pattern of cropping on low land is composed of three major farming patterns as described in the fig. 4

Fig. 4 Actual Cropping Patterns on low land
Source: Result of field’s survey in Vinh Bao in 1998

- LL1 pattern is mainly introduced in low land where floods often occur in July, August and September. Therefore water drainage needs to be done before late winter rice seedlings can be transplanted.
- LL2 pattern is mainly introduced in higher field where flooded water can be drained quickly.
- LL3 pattern is introduced during autumn-summer crop in order to avoid flood occurrence in August and September.

To sum up, the low land has advantages of fertile soil and convenient irrigation. However, the possibility to increase the number of crops per year of the same cultivated land is limited.

(4) Cropping Patterns on Hollow Land

Only summer rice crop is cultivated in this area which the rice seedlings are transplanted in October of a year and harvested in May of the following year. Because the hollow land area has two seasons, the dry season, which lasts from October of a year until May of the following year, and the rainy season, which lasts from May until October. On this time, farmers can not growth any kind of crops.

IV Conclusion

Study of cropping pattern in different areas indicated that irrigation condition is the main factor that influencing the crop productivity and the numbers of crop cultivation per year for each area. The study has showed a number of basic experiences in the transformation of the cropping pattern in agriculture in the study area.

The study has described, analyzed and assess the actual situation of land use in Vinh Bao district of Hai Phong province, pointing out the advantages and disadvantages of the existing land use in the district.

References