

## CHAPTER 3

### RESEARCH METHODS

#### 3.1. Study area, sample size and the scope of the study

The delta plain and sandy coast zone in Thua Thien Hue province were chosen for conducting this research.

- Four villages in four districts were selected for the survey, of which two villages are located in irrigated areas and the another two villages are in rainfed low land areas. Thuy van and Thong nhat villages with good irrigated system were chosen for collecting data relating to transplanting rice and broadcasting rice in irrigated areas. Phu da and Quang thai villages were chosen for the rainfed lowland.
- Thirty farmers were interviewed in each village. So that the total sample comprised 120 farmers in both regions
- The cross-season data and information about the production of spring season rice in the year 1998 and summer season rice in 1987 were used in this study. Number of households in the districts and villages interviewed are presented in Table 1.

Table 1: Total respondents by location.

Location	Districts	Villages	Farmer(HH)	% of total farmer
Irrigated	Huong thuy	Thuy van	30	2.8
	Huong tra	Thong nhat	30	3.6
Rainfed	Quang dien	Quang thai	30	6.6
	Phu vang	Phu da	30	4.0

### 3.2. Data collection

(1) Secondary data sources: Time series data were collected from rice statistical books, Agricultural Cooperatives and Department of Agriculture in Thua Thien Hue province.

(2) Primary data sources: Informal and formal surveys were undertaken for the following data:

#### a) *Socio- economic profile of the communes:*

The household structure, family labour, education level of the household head, practice of hiring labour, availability of capital, and constraints to rice production.

#### b) *Agronomic practice:*

The cropping pattern, planting method, level of fertilizer application, rice variety used, pest management, weed management, source of seed, method for selecting rice seed and source of technical knowledge as well as environmental constraints to rice production.

**c) *Costs and returns of rice production.***

Area cultivated, yield, price of input and output of transplanting rice and broadcasting rice in two planting seasons as well as in two environments were collected for data analysis.

**3.3. Methods of analysis**

To achieve the objectives, the data was analysed by using both qualitative and quantitative methods. The specific methods are briefly discussed as follows:

**3.3.1. Descriptive analysis.**

To achieve the first objective, to review the situation of rice production system in Thua Thien Hue province, the results from formal survey and interview were analyzed using descriptive statistics and gross margin analysis.

Percentage, mean and standard deviation were used for the analysis of farming systems components, technologies which are related to rice productivity in each production system, production constraints and supporting factors, and the farmers' socio-economic status, sources of technical knowledge as well as opinions on extension services.

**3.3.2. Quantitative analysis.**

**(a) *Gross margin analysis.***

Gross margin analysis is widely used by researchers to analyze the performance of a particular farm enterprise (Castle *et al.*, 1987). Gross margin of an

enterprise is defined as the enterprise gross return minus the variable expenses attributable to that enterprise. Gross margin analysis facilitates the evaluation of the economic efficiency of the farms existing way of producing crops or livestock. It is used to compare the profitability of the enterprise within a farm, or the profitability of a similar farm (Anderson *et al.*, 1977). The variables included in the gross-margin analysis are as follow:

Yield per area	= Total production divides by total area (kg/sao)
Total revenue	= Total production in kg multiplied by price per kg (VND/sao)
Net return	= Gross return minus total cost (VND/sao)
Material input cost	= Cost of seed (own supplied and purchased) fertilizer, pesticide, irrigation fee (VND/sao)
Machine costs	= Cost of land praperation and threshing by tractor (VND/sao)
Labour costs	= hired labour plus imputed value of family and exchange labour ( VND/sao)
Total cost	= Material costs plus labour cost plus land tax plus machine cost (VND/sao)
Return to labour	= Gross return minus all cost except family labour divided by total family labour (VND/manday)
Return to material input	= Gross return minus labour cost divided by cost of material input ( ratio)

The currency used in calculating cost, return and other measurements is the Vietnamese currency (VND). One \$US was approximately equal to 13,800 VND

during the survey (April and May, 1998). Costs and returns of production were evaluated at farm gate price.

*(b) The production function*

To achieve the objective of identifying the factors affecting rice production with regard to different planting methods and different agro-economic regions, multiple regression analysis was employed to estimate the production function (Studenmund, 1991; Chand et al., 1986). Determination of the production function included information on input utilization such as, manure, urea, potassium, phosphorus, cost of pesticides, cost of herbicide as well as man days of labour for rice production. Different planting methods and planting seasons as well as the different production environment of farmers also were assessed in term of their rice yield. From the production function, marginal analysis of input responses to output was calculated. In this study the appropriate production function was explored in order to analyse the following:

- Irrigated lowland transplanting of rice for production in spring season.
- Irrigated lowland broadcasting of rice for production. in spring season.
- Irrigated lowland transplanting of rice for production in summer season.
- Irrigated lowland broadcasting of rice for production. in summer season
- Rainfed low land transplanting of rice for production in spring season
- Rainfed low land transplanting of rice for production in summer season

- Rainfed. low land broadcasting of rice for production in summer season

In general the production function was expressed as follows:

$$Y = f(Mn, N, P, K, Lb, H, Ps, e)$$

Where:

Y = Rice yield (kg/sao)

Mn = Manure (kg/sao)

N = Urea ( kg / sao)

P = Super phosphate fertilizer application (kg /sao)

K = Potassium chloride fertilizer application (kg KCl/sao)

Lb = Labour (man days/sao)

H = Herbicides application (VND/sao)

Ps = Pesticides application (VND/sao)

e = Error term.

Note: 1 sao equivalence 1/20 hectare or 500m<sup>2</sup>