

Chapter 5

Profile and Production Systems of the Study Area

Cu Sue commune is one of the 15 communes of Cu Mgar district in DakLak province in the lower part of Eatul catchment. The commune is divided into ten villages with the commune office located at 16 kilometer from Buon Ma Thuot City. Topography of the commune is characterized by a relatively flat upland that is intersected by deep streams crossing the villages, and at some locations, it is hilly and rolling with relatively steep slopes. The area is covered with perennials crops like coffee, rubber, pepper, scattered fruit trees, and annual crops, such as rice, maize, green bean, soybean, and groundnut. Of which, coffee is the main commercial crop and the main income source for the farmers here.

5.1 Physical settings of the study area

5.1.1 Climatic condition

The climate of the study site is characterized by a wet and a dry season. The wet season starts from May and ends in October. The dry season is in the remaining months of the year with an average temperature changes from 22 to 24 degree centigrade. The annual rainfall is about 1,700 millimeters with an average monthly precipitation ranged from 4.0 to 298 millimeters. The relative humidity ranged from 71 to 88 percent. More than 80 percent of the rainfall is concentrated between the month of August and September. In the dry season rainfall is usually very low; therefore, crop cultivation is not possible without irrigation. But the irrigation system is poorly developed and managed, which poses a problem both in dry and rainy seasons. The climatic conditions in Buon Ma Thuot are presented in Figure 1.

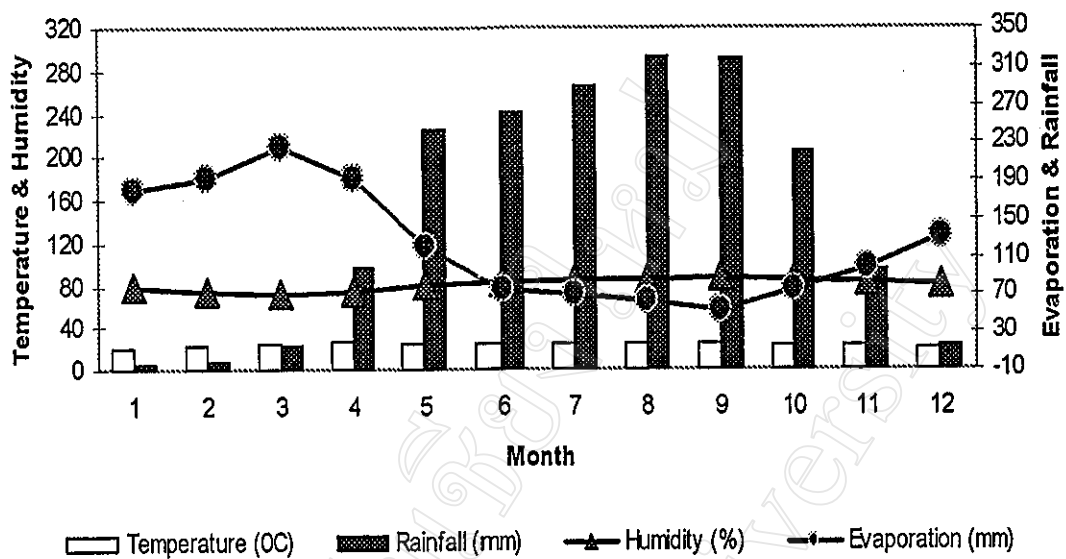


Figure 1 Meteorological factors of Buon Ma Thuot (1988 – 1998)

Source: *Meteorological Buon Ma Thuot station, 1999.*

5.1.2 Social-economic setting

The demography of the study site is characterized by a mixed population composition of three ethnic groups, Kinh, Ede and Man. The Ede group is the indigenous population who has lived at this place for a long time whilst both of Kinh and Man groups moved to this area after 1975.

Table 4 Demography of Cu Sue commune

Items	Male	Female	Total	Percentage	No. of HH
Kinh	1,815	1,890	3,705	40.4	670
Ede	1,820	1,871	3,691	40.25	515
Man	898	875	1,773	19.33	245

Source: *Survey, 2002. HH: households*

Cu Sue commune is ranked as the category II area as followed the classification of the government. Table 5 shows that the most households in this commune fall into the medium level group accounts about 70 percent, followed by

high income group accounts for 26 percent. Then, there were still 4.0 percent of poor households with the total income less than \$1,300 in a year.

Table 5 Economic status of households at Cu Sue commune

Items	Annual income per household (\$)	No. of household	Percentage
High	> 2,600	375	26.0
Medium	1,300 – 2,600	997	70.0
Low	< 1,300	60	4.0

Source: Survey, 2002

5.2 Agricultural production at the study area

Agricultural production plays a significant role in the economy of the commune, contributing to the largest share of income for the local people. It is characterized by a concentration of mono-culture of commercial coffee production as the result many forested areas are being replaced first by annual food crops and then by coffee plantations.

5.2.1 Land holding

Table 6 proves that the main income for farmers here comes from coffee production. The other income sources come from upland cash crop production like maize, beans, and rice. Farmers usually cultivate annual crops on parcels of land, which are marginal or not suitable for coffee cultivation. The commune currently had a total of 2,918 ha for agricultural production, of which the coffee area had 2,065 ha, accounts for 70 percent of agricultural production, followed by rice accounts for 13.5 percent, and then, rubber had 8 percent. Aside from that, the other crops like black pepper, fruit trees and other perennial crops were also available in this commune.

Table 6 Land holding for agriculture of Cu Sue commune

Crop	Area (ha)	Percentage	Yield (ton ha ⁻¹)	Productivity (ton)
Coffee	2,065	71.0	3.0	5,685
Rice		13.2		
One crop	300	10.3	5.0	1,500
Two crop	33	1.13	4.5	148
Upland rice	50	1.72	1.5	75
Annual upland crop		4.71		
Maize	70	2.4	5.5	385
Soya bean	31	1.06	1.0	31
Ground nut	22	0.75	1.2	26.4
Green bean	15	0.5	1.1	16.5
Rubber	227	7.8	NA	NA
Pepper	90	3.1	1.1	99
Others	15	0.5	NA	NA
Total	2,918			

Source: Survey 2002 from interviewing people' committee of Cu Sue commune.

5.2.2 Cropping pattern

Aside from coffee, there are other perennial and annual crops in this commune: pepper, rubber, maize, beans and rice. These crops were planted on a small-scale in rainfed areas, where were marginal or not suitable for coffee cultivation. Maize is planted in both Summer-Autumn and Autumn-Winter seasons as a mono or intercropped with coffee and beans. Pepper was planted scattered as intercropped with coffee areas. Currently, farmers are planting mostly the hybrid varieties instead of local varieties. The products were normal sold at the local market or used as livestock raising. Rice production was planted scattered in the lowland areas in the deep stream valleys crossing the commune, most of the farmers cultivate rice only for home consumption. There is two rice crop seasons: Winter-Spring and

Summer-Autumn season. The Winter-Spring rice season is from November to March and Summer-Autumn season takes from May to August. Rice production, however, fluctuates considerably due to shortage of water in the Winter-Spring season and unstable rainfall, i.e. periodic droughts at the beginning, and floods in the middle of the Summer-Autumn season (Cropping pattern of Cu Sue commune is attached in the Appendix I).

5.3 Coffee production system

5.3.1 Importance and opportunity of coffee production

Coffee production is one of the most profitable agricultural ventures in this study area that contributes to the highest income for most farmers. The total area devoted to coffee has expanded rapidly during the last few years. This is attributed to the favourable climatic and good soil conditions, favourable prices of coffee in the year from 1993 to 1997. The commune has a total area of 2,065 ha; of which 1,890 ha are bearing coffee and the rest of 175 ha are non-bearing. The coffee producers in this commune were individual farming owners. Its cultivation represents a source of income for almost the household in this commune and generates employment from the production and commercialization of the crop.

Most coffee plantations were planted on the basaltic soils. However, a few areas were planted in black soils as well but the yield was generally lower. It is planted during the first month of raining season annual. Coffee usually gives its first yield in the fourth year. It is in some cases like under a good soil condition or when the plantations undertake intensifies, farmers usually harvest even in the third year. Coffee has been planted as a mono-crop in large areas; however, at its premature stage, annual crops like maize, green beans, soya-bean, groundnut etc. are often intercropped with coffee until coffee tree starts bearing fruits or its canopy is closed. The seedlings are raised in poly-bag, which is kept in the nursery garden about six months before transplanting. Coffee tree can be propagated vegetative either by budding, grafting, or by root cutting to produce plants genetically identification with a

single parent. However, those methods have not been broadly applied in real practices, as they require high costs and skilled labors.

The inputs for coffee were mainly fertilizers, chemical pesticides, labor and water. Irrigation is a decisive factor for coffee production with long and severe dry seasons ranging from five to six months in DakLak province. Therefore, groundwater from hand-dig well is the most important source for irrigating coffee. On average, farmers in this commune had to dig one well for getting ground water to irrigate about one hectare of coffee.

The average area planted coffee in the study area was 1.47 hectare per household occupying the largest proportion 76 percent of the whole commune. The main variety was planted by robusta variety. In establishing of coffee plantations, a planting density of about 1,100 trees ha⁻¹ was commonly used by farmers. The average age of coffee tree was seven years at present throughout the whole commune. Of which, most coffee plantations were planted in 1989 or 1990 in concentration area, and after that coffee area has been planted all throughout the commune by expanding the forest areas resulted in contributing to deforestation.

5.3.2 Maintenance activities of coffee production

The annual maintenance activities and operation time greatly differed from one farmer to another, but normally those are the common activities for bearing period on coffee production included weeding, enlargement of irrigation basin, fertilization, harvesting, grafting, pruning, plant protection, and post harvest. These activities might be changed yearly depending on the climatic conditions, and the labour availability. For example, plant protection by chemical method is done as and when required but often during the period of transitional seasons.

Harvesting is the most time-consuming in coffee production. This activity usually starts at the beginning of October and finishes at the end of December. Its labour peak is in November yearly. At present, local producers at the survey area still

resort to traditional of manual harvesting method. The crop is usually picked into baskets, flatted or slightly curved to fit the body, or into reaping pockets made from half jute bags, carried on the body. Farmers in the study area seldom hire labours from outside. They often exchange labour with their relatives or neighbouring households on the peak periods.

The common and only processing activity of post-harvested is sun-drying method since it is cheap and simple method. The berries are spread thinly on any available flat surface, such as a cemented floor, woven mats, sacks, or even on the ground. Berbert *et al.* (2001) reported in Brazil where drying is generally considered the most critical operation in the harvesting in roasting sequence of coffee processing, and it is usually agreed that improper drying is the primary cause of a deterioration in coffee aroma, flavour and taste. Producers need well-controlled drying techniques, which consists of two different drying stages. First, freshly harvested whole coffee cherries or parchment coffee are spread on paved terraces where they are allowed to dry under the sun until they reach 35 to 30 percent moisture content where in the second stage the coffee is dried in high-temperature mechanical or fixed-bed dryers down to about 13 percent moisture content.