

Topic 1

1.0 Concepts, Definitions and Classification of Farming Systems

1.1 A system is a set of inter-related, interacting and interdependent elements acting together for a common purpose and capable of reacting as a whole to external stimuli. It is unaffected by its own output and it has external boundaries based on all significant feed backs.

1.2 Farms are systems because several activities are closely related to each other by the common use of the farm labour, land and capital, by risk distribution and by the joint use of the farmer's management capacity. The analysis of farms is quite important to the subject of development. Relevance of the farming systems approach: Choosing policies for agricultural development requires the use of information about the existing farming situation. A farming system results from a complex interaction of interdependent and interrelated components of elements that bear upon the agricultural enterprises of the rural household. At the center is the farmer who takes decision in an attempt to achieve his aspirations, goals and desired objectives within the limits of technologies available to him. He uses inputs to get outputs in response to the technical elements which is the natural resource endowment in any given location restricting what the farming system can be. The human element provides the framework for development and utilization of a particular farming system.

1.3 Definition of Farming system

Farming system is a unique and reasonably stable arrangement of farming enterprises that a household manages according to well defined practices in response to the physical, biological and socio-economic environment and in accordance with the household goals preferences and resources. These factors combine to influence the output and production methods. More commonalities will be found within system than between systems. Farming system belong to a larger system and itself can be subdivided into subsystems

1.4 Characteristics of farms:

1.4.1 *Goal orientation*

A farm is taken to be an organized decision-making unit in which crop and/or livestock production is carried out with the purpose of satisfying the farmers goals and preferences. On large scale, market production and profits are the main objectives whereas for the small-holder farmer who farm most of the tropics the farm is a multi-objective system that provides food for the household, raw materials for building huts, accumulation of wealth and capital in form of animals or plantations.

1.4.2 *Boundaries*

The farm as a system has boundary that separates the system from the environment. The system embraces all workers and resources (elements of the system) which are under the management of the farmer. All land used wholly or partly for agriculture belongs to the farm.

Processing units are part of the farm wherever they are if they are under the management of the farmer.

1.4.3 *Activities*

The farm is characterized by activities that turn input into output including crop and livestock production, as well as processing, marketing maintenance, and procurement.

1.5 Classification of farming system

Farm as a unit transfers input into agricultural output and which undergoes changes over time. In the process of adapting cropping patterns and farming techniques to the natural, economic and socio-political conditions of each location and the aims of the farmers, distinct farming systems are developed. For the purpose of agricultural development it is advisable to group farms with similar structures into classes

1.5.1 Collecting

This is the most direct method of obtaining plant products. It includes regular and irregular harvesting of uncultivated plants. Hunting goes hand in hand with collecting. It is still being practiced to provide additional to the normal subsistence food supply. It is only in few cases like wild oil-palm in some parts of west Africa and gum Arabic in Sudan and wild honey in Tanzania that collecting is a major cash earning activity.

1.5.2 Cultivation

a) *Classification according to type of rotation*

Cultivation alternates with an uncultivated fallow which may take the following forms Forest fallow made up of woody vegetation with trunks, a bush fallow comprising of dense wood without trunks A savanna fallow comprising of a mixture of fire resistant trees and grasses and in which grasses are dominant 4. a grass fallow comprising grass without woody vegetation, Ley systems describes where grass is planted or establishes itself on previously cropped land. The grass is allowed to grow for some years and used for grazing. \wild and unregulated ley are common in the savanna. In regulated ley, the swards are established during fallow the non cropping period. This is rare in the tropics but are found in some highlands (Kenya) and in Latin America. Field systems occur where arable crops follow another and where established fields are clearly separated from each other. System with perennial crops (field and tree crops)

b) *Classification according to the intensity of rotation between cropping and fallow period*

Considerable variation and degree of intensity exists between cropping and fallow period within one cycle. The symbol R is the number of years of cultivation divided by the length of the cycle of land utilization multiplied by 100. If 20% of available land in one holding is cultivated, then R is 20% The larger R becomes, the more stationary is farming. When is $< 33\%$, it is shifting cultivation : When $R > 33\%$ and $< 66\%$ it is Fallow systems:while it is permanent cropping when $R > 66\%$. Permanent cropping can again be classified according to the degree of multiple cropping. An R value of 150 would indicate that 50% of the area is carrying two crops a year. and three crops a year for a value of 300

c) *Classification according to water supply*

This is in terms of whether it is irrigated farming or rain-fed farming

d) *Classification according to the cropping pattern and animal activities*

This classification is according to the leading crops and livestock activities of the holdings. Each activity has different requirements as to climate, soils, markets and inputs e.g. coffee-banana holdings or rice-jute holdings

e) *Classification according to the implement used for cultivation*

In different parts of the world, land is cultivated by methods that requires no implement or simple tools. In the Sahara desert nomads sow millet without fire-farming or soil preparation, shifting cultivators frequently sow in ashes without touching the soil. Rice growers in Thailand make use of water buffalo to trample on moist fields. The main divisions vary from hoe-farming or spade farming to farming with ploughs and animal traction to farming with ploughs and tractors

f) *Classification according to the degree of commercialization*

Farms are classified into three groups based on the destination of the agricultural output

1. Subsistence farming –if there is virtually no sale of crop and animal products,
2. Partly commercialized farming-- if more than 50% of the value of the produce is for home consumption
3. Commercialized farming--- If more than 50% of the produce is for sale.

1.5.3. Grassland utilization

Low yields in grassland area of in the arid and semi-arid areas necessitated nomadic life, or semi-nomadic life, or development of ranching

- a. Total nomadism – the animal owner do not have a permanent place of residence. They do not practice regular cultivation and their families move with the heards tended by herdsmen
- b. Semi-nomadism where the animal owners have a semi-permanent place of residence near which supplementary irrigation is practiced. However they travel with their herds to distant grazing areas
- c. Transhumance in which farmers with a permanent place of residence send their herds tended by herdsmen for long period of time to distant grazing areas
- d. Partial nomadism is characterized by farmers who live continuously in permanent settlements with their herds remaining in the vicinity
- e. Stationary animal husbandry occurs where the animals remain on the holding or in the village through the entire year