Topic 3

3.0 Characteristics of the Small-Scale Tropical Farming Systems

3.1 Very small farm size

Farm size is very small in the tropics. The mean farm size is often less than four hectares. Farms are generally smaller in the forest agro-ecological zone than in the savanna. It is relatively easier to clear savanna vegetation than that of the rain forest. Farm sizes are influenced by ecological and socio-economic factors. Increased human population results in smaller farms; an example is Taiwan where human the average farm size is 1.6 ha. There is flexibility of labour on small farms. It is easier to take decision on what is to be done. It may also be difficult for the extension and marketing agents to transmit knowledge since most farmers are on their own and are not organized into cooperatives. In Africa, experiences have shown that small farms could be more productive than large ones in the long run. As a result of small farm size, the use of tractor and their maintenance could be quite expensive. There is high cost of tractor equipment in Africa than in Europe because of shorter life span due to lack of spare parts and unskilled maintenance manpower.

3.2 Predominance of hand labour

Small scale farming is largely dependent on hand labour to about 60-80%. Animal power is about 20% while use of tractor is negligible..On most soils in the tropics water infiltration and low level of microorganisms are problems. With increased cultivation yield decreases from hand hoe>oxen>tractor. Tools utilized are usually inexpensive and readily available and the skill required are already there. There is no need for special training unlike in use of machines Disadvantages include problem of efficient utilization of the labour force. Timeliness of

operation is a problem since the use of hand labour is time consuming. It also brings about drudgery.

3.3 Predominance of mixed cropping or intercroppig

Mixed cropping or intercropping is a widespread cropping practice in the tropics. It is only flooded rice and wheat that are not grown in crop mixture. The advantages include efficient utilization of environmental resources particularly when crops of different maturity cycle complement each other. Provision of favourable microclimate through shading.. Stability of yield as it minimizes risk against crop failure. It reduces erosion as well as preventing the spread of diseases and pests. It has high labour requirement than for sole crop and labour utilization is spread through the season. A major disadvantage is difficulty in mechanization of operations like weeding and harvesting.. Spraying of the lower growing component crop in the mixture is often difficult.

3.4 Priority for subsistence food crops

It is characteristic to produce first food for home consumption before any consideration for cash crop. A food crop can become cash crop when produced in surplus

Topic 4

4.0 Nomadic farming, Shifting Cultivation, Fallow Rotation, permanent Cultivation, Ley farming etc.

4.1 Nomadic farming

Nomadic farming refers to the practice in which livestock farmers move around for a least part of the year, usually in search of water and grazing for their animal for their primary products of

meat and skin, and their secondary products such as wool or hair, milk, blood, dung, traction, and transport;

Because of the different climates and environments of the areas where nomadic pastoralism is practiced and because of the ecology of their herd animals, this management includes daily movement and seasonal migration of herds;

The majority of the members of the group are in some way directly involved with herd management, the household therefore moves with these seasonal migrations; and 4) while the products of the herd animals are the most important resources, use of other resources, such as domesticated and wild plants, hunted animals, goods available in a market economy, is not excluded.

4.1.1 Geographic distribution

Nomads north inhabiting north and north-east Africa includes Afar, Beddouin, Berbers and Tuaregs among others. In west and central Africa examples include the Fula or Fulanis and the Toubou of Niger and Chad. Nomads are also found in East Africa, Afghanistan, Turkey, as well as south and central Asia including southern and northern Europe

General Characteristics of nomadism

a. It takes place mainly in marginal areas where crop cultivation is not possible

b. Animals (cattle, sheep, goat, camel or horses etc.) feed on the forage of lands which humans cannot directly utilize and convert the energy into sources available for human consumption: milk, blood and sometimes meat.

c. The common conception that pastoralists exist at basic subsistence is not true as groups often accumulate wealth and can be involved in international trade. Complex exchange relationships

exist with horticulturalists, agriculturalists and other groups; pastoralists rarely exist exclusively with the products of their herd.

d. Important components of the pastoralist adaptation include low population density, mobility, and dynamism, and complex information systems.

e. Nomadism is well adapted to the environments where it exists;

f. Lands long used for pastoralism have evolved under the pressures of regular grazing on one hand and, fire was a method of rejuvenating pasture land and preventing forest re re-growth.

g. Nomads have deep knowledge of their environment as they operate a well developed traditional information network.

4.2 Shifting Cultivation

Shifting cultivation is used for a system that involves an alternation between cropping for a few years on selected and cleared plots. A few years of cropping is followed by a lengthy period of fallow when the land is rested to regain its original soil fertility. It is a technology that has been practiced in thinly populated regions across the world. It is particularly popular in forested and derived savanna areas of tropical Asia, Africa and Latin America.

4.2.1 Types of shifting cultivation

a. Vegetation systems

The system could be practiced in the forest, savanna or in forest/savanna transition where the fallow land are dominated by forest, bush {thicket) or grassland respectively. The low population density , humid and forested areas of Peoples Democratic Republic of Congo, Borneo in Indonesia are examples.

b. Migration systems

Whenever new land is cultivated, there is a tendency for the farming household to move with their household if transportation of produce (e.g. root crops) is becoming problematic. This results in gradual migration.. Usually the huts are always due for repairs every 2-3 years under forest condition and it is often easier to build a new hut than repairing an old one . The frequency of movement and the distances covered seem to increase with rainfall. The Amazon Basin in Brazil and Philippines in Asia are areas where examples are found

c. Rotation systems

For sedentary cultivators, a definite number of fallow years often follow a definite number of years of cropping in a regular sequence. However it may have an irregular character. In the forest zone, 2-4 years of cropping may be alternated with one or three decades of fallow.. In the savanna of Africa, it could be more complicated when short term fallow period of 1-2 years, medium fallow period of 3-5 years or long fallow period of 6 years or more alternate in a single cycle of land use. short fallow periods are often associated with lack of labour during the cultivation period while decreasing soil fertility and increasing weed growth are associated with long fallow period

d. Clearance system

The mode of land clearing depends on the following: rainfall distribution, vegetation to be cleared, crop grown, cultural background of the population and available tool.

4.2.2 Advantages of shifting cultivation

Easy to cultivate quickly, environmental friendly because is organic farming. It is a form of weed control, it can play a part in weed management and it may reduce incidence of soil borne diseases and insect pests. It promotes biodiversity. It is a highly adaptive means of production

4.2.3 Disadvantages of shifting cultivation

This system is not for long term. Not good for land that is used for only one type of crop. It does not produce enough food. It is not cost effective. It is troublesome for farmers to always move around. It is highly susceptible to high increase in population. It requires a large land area because of inadequate cultivable land. It .wastes farmers energy resources in frequently slashing vegetation..

4.3 Fallow systems

Fallow systems refers to when the period of fallow is not long enough for the original soil fertility to be restored after cropping and not short enough for stationary farming. This is typified by R value of 50 when 3, 6 or 10 years of cropping is followed by 3, 6 or 10 years of fallow. This is often caused by increased population pressure and expanding cash crop production..

4.3.1 Characteristics of fallow system

a. The land holding is permanently and clearly defined

b. Most of the farmers practice hoe cultivation

c. System is labour demanding

d. Area under cultivation are larger than under shifting cultivation

e .Yields of produce are lower because of the lower soil fertility but the overall output is higher

because of the larger area

f. There is priority for subsistence food crops although cash crops are prominent

4.4 Ley systems

Ley system involves alternating a field planted with crops for a number of years with a planted fallow used for growing hay for another number of years, after which it is again used for cropping

The benefits include improved soil fertility and structure, reduction of erosion and land degradation improved weed, insect and disease control

4.5 Permanent cultivation system

As cropping of the field becomes more intensified and the period of fallow more shortened or eventually absent, farming becomes permanent. This is particularly the case in densely populated areas of Kano (north Nigeria), and the Ibo and Ibiobio.

Because of the strong leaching of the nutrients permanent upland cultivation of annual crops may result in a severe decline in soil fertility and in very low yields. In the humid areas of West Africa, perennial crops like oil palm, cacao, and coffee have long been cultivated on the uplands. If these crops are intensively cultivated, the requirements of fertilizer, management, capital, and technical knowledge are high. In West Africa, these crops are produced for the export market.