

# Farming Systems for Kirindi Oya Irrigation and Settlement Project (KOISP)

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**Introduction:**

This effort is to investigate the possible options, preferably the optimum, to establish an effective Farming System or Farming Systems at the Kirindi Oya Settlement Scheme.

To study a particular farming system on a series of farming systems, it is assumed necessary to draw, (1) a definition for farming system/s; (2) parameters to gauge its dimensions; (3) the forms and uses and purposes of these farming system/s; and (4) the links between the farming system/s and the market place.

Establishing a definition for farming systems in the KOISP context, in this instance, has been based on the distribution of land to the settler-farmer-operators, in accordance with the Project Blue Print. Farming System/s for this purpose, has been examined through a series of elements and an attempt to define Farming System/s, in the KOISP context, is the final aim.

The elements, that are considered relevant, are as follows;

1. Crops,
2. Cropping System/s,
3. Husbandry,
4. Post harvest Technology/techniques, and
5. Market links/Markets.

**Element 1: Crops**

Crops, essentially are those that determine the necessity to adopt one or

another form for a farming system/s. Crops cultivated for cash have to be dealt with in a manner removed from crops cultivated for subsistence.

The crops, cultivated at the KOISP, in the current situation, fall into both the above stated categories.

Rice, Cowpea, Mung, Groundnut, Cucurbita produce-pumpkins and gourds, and beetle are some of the crops cultivated at the project site and fall into either one of the above categories. Onions and chillies counted as other food crops, are essentially cultivated for purposes of cash returns. The necessity to study crops also extends further i.e. to identify crops that would expand the potential of the land and climate of this location to derive higher incomes, to introduce a variety of crops which could be drawn for cultivation by the farmer-settler-operator in keeping with his affordability to meet the crop requirements, to utilise the land parcels afforded to meet market demands for low cost agricultural produce for consumption.

On this basis, a set of food crops and cash crops, are suggested below; Cotton — a cash crop for the textile industry, Acaceae — as animal food, Vinca Roseae — a source to extract a medicinal chemical, Alfa-Alfa — as animal food again and Bougainvillia — for pota-pouri and interior decor, are crops suggested for purposes of commerce and raw-material for livestock and dairy.

Sesame, Pigeon pea, Wheat-Durum, Barley, Amu, Meneri, Citrus-tangerine, tangelo and lemon, Mango and Wood Apple are some of the crops suggested for subsistence and commercial cropping.

The crops suggested above, for study, might in certain instances be, crops evaluated at the Kirindi Oya project site in an earlier occassion and failed due to a multitude of reasons; viz. the crops species not being able to thrive and yield as anticipated in the given location; the cost of production being far above the farmer-settler-operators' affordability; and the market situation not been investigated in detail etc.

Anyhow, it is considered necessary to re-evaluate some of these crops and a series of new crops with due attention paid to the links between the variety and the environment. This is considered necessary as there is a need for high value crops at low or stable costs of production and crops that would expand the choices available to the consumer in the common market on the same basis, at the given location — ecologically an arid zone.

The research on crops is considered necessary to re-evaluate some of these crops and a series of new crops with due attention paid to the links between the variety and the environment and is suggested to be carried out on a participatory basis with researchers, experts, farmer-settler-operators, extention personnel and implementors playing a participatory role in the evaluation. Markets; traders — the relevant interested parties, and personnel dabbling with market intelligence should also be engaged in these research efforts.

The sources from which these crops are drawn for this form of evaluation should closely be identical to the climate and edaphic conditions of the KOISP site eg. cotton species from Hydrebad, India could be a better option than cotton species from Central Asia and Africa. The same thinking process is applicable to the imortation of other species, if necessary, categorised under other food crops, cereals, legumes etc.

**Element 2: Cropping System/s:**

A cropping system, which encom-

passes diverse crops contributing to the enhancement of incomes as well as the nutrient levels of the consumers and producers would be the ideal form to be adopted in a situation like the KOISP.

The crops evaluated for their ability to generate high yields at the given site should further be fitted into a cropping plan where the water requirement of each of the species would not threaten the cultivation of one another. The necessity for this is the limitation set by the availability of water at a given point in time, at the KOISP site. Therefore, the cropping plan worked out should be a whole network of crops requiring different levels of water for the stages; Growth, Reproduction and Maturity. An example of such a cropping plan is set out below;

**Note:** The lapse time for this cropping plan, for a lowland plot, is two years.

#### Cropping plan-lowland

1. Rice
2. Cowpea
3. Bombay onions/Chillies
4. Alfa-Alfa
5. Fallow

2 Y E A R S	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	
	1	2	3	4	5	Season 1
	2	3	4	5	1	Season 2
	3	4	5	1	2	Season 3
	4	5	1	2	3	Season 4
	5	1	2	3	4	Season 5

**Diagram 1: A two year cropping plan spread over five seasons.**

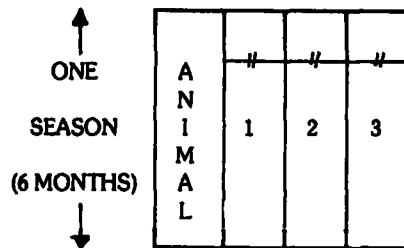
#### Cropping plan-highland

The cropping plan for the highland plot, in this instance, is worked out for a crop-livestock integrated effort.

**Note:** The use of the total acreage under a highland plot for animal and crop is on a 1:2 ratio.

1. Maize/sesame
2. Fallow
3. Alfa-Alfa

**Note:** Scenario 2 will be when the combination is animal & 2, 3 & 1 for crops.



**Diagram 2: A horizontal use of a highland plot over one Season — 6 months. (Scenario 1)**

#### Element 3: Husbandry

Husbandry, an element under Farming system/s falls directly under farm management which is generally a component considered under a theme when farms are established as a commercial unit for purposes of generating profit. Anyhow, in the KOISP context the conditions yet have not matured to consider the holding of a farmer-settler-operator as an enterprise but a holding which assures the farmer-settler-operator a minimum income to survive. Therefore the husbandry patterns in the KOISP context are analysed on the types of land within the holding of a

farmer-settler-operator, ie. lowland, highland and homegarden.

Highland cultivation, generally depends on rain and therefore the cultivation practices and to extents the crops cultivated differ from lowland cultivation which is sustained both by rain and irrigation water. The planning and organisation required to sustain lowland plots in any condition including that of KOISP are more complex with numerous minute details investigated for effective implementation of this element in the context of a farming system. Whereas, in highland cultivation the only variable relating to

the availability of water is the rainfall pattern. The complications with regard to the distribution of irrigation water, the timeliness in delivery and farmer consensus are issues confronting irrigation schemes in the provision of water to farmer-settler-operator fields.

Since, lowland plots could be utilized for a variety of purposes ranging from flooding for paddy to drysurface farming with OFCs, legumes, cereals etc. the husbandry practices to be applied are diverse. Land preparation, sowing/planting, input application and harvesting are the basic stages through which crop cultivation moves to derive yields from one crop or another. The variable relating to each of these stages are determined by the requirement of the crop and therefore are applied in the following sequence; Land preparation — land clearing, tillage at the specific depth and attaining the required soil texture; Sowing/Planting — the spacing for planting or in the case of rice whether it is transplanting or broadcasting; Input application — the sequence of basal application or top dressings; and Harvesting — the times of harvesting for annual, biennial or perennial crops, Ratoons, if another lesser productive cycle is envisaged.

As practices are crop based, the cultivation in the highlands somewhat differ due to the limitations in the range of crops cultivated in highlands and the levels of yields anticipated from these crops.

Home gardening, is seldom worked on a mono-culture. The mixed cropping in these plots is believed brings the produce to supplement family diet. Anyhow, in the KOISP context both mono-culture and mixed cropping were observed. The mono-culture was generally confined to OFCs.

The emphasis through out this brief article is to examine the possible profitable uses that could be derived from the various types of land — highland, lowland and homegarden made available to the farmer-settler-operator, at the KOISP site.

The observations to date have revealed that of the three types of land made available to the KOISP farmer-settler-operator, the highland plots are made

minimum use of due to the limited rainfall in this location.

The highland plots in the KOISP site, visually, were extremely dry on the surface. The application of simple tools to this hard pan might not effect the required tillage depth wise or texture wise. In order to work this hard pan it is assumed that large quantities of water have to be applied to moisten the soil layers. This is anticipated would be conducive to till the surface with simple tools/equipment available to the farmer-settler-operator in the current context, at the KOISP.

In order to withdraw the highland plot from being a liability to the farmer-settler-operator instead of the initial intention of the project to make this parcel of land an asset whereby the farmer-settler-operator could derive an income, the following approaches are suggested; (1) to provide an alternative source of water for highland irrigation instead of the farmer-settler-operator depending totally on rainfall for cultivation, and (2) to terminate the distribution of highland plots to the individual farmer-settler-operator and retain the highland plots in a unit block for other ventures such as; (a) establishing infrastructure to promote industry — agri based or otherwise — where the off season labour of the farmer-settler-operator community could be utilised and the individuals engaged in such industries could supplement their personal incomes and (b) the highland holding could be cultivated with orchard crops viz. Mango, Wood Apple, vegetables etc. which could be used as raw material for agri-industries if the markets for such processed products are established. Investigations could also be made

to identify aspirations, needs and plans of the farmer-settler-operators and in the event of the said wanting to set up their own enterprises based on the prior knowledge and skills in their possession, credit and other support services could be extended for such purpose.

If approach 1 is considered the action required would be to provide a source of water for highland irrigation. The sources as observed, are limited. The use of surplus water from the reservoir in the event of a cropping plan being introduced where the provision of water for the lowland plots could be economised, is suggested as an alternative.

Another alternative would be to utilise another source of water in the vicinity which in the current context serves a limited purpose. For example the lagoon; in this instance costs have to be borne to desalinate water from the source for use. Anyhow, the feasibility of the two approaches have to be investigated if the necessity to irrigate highland plots is in question.

#### Element 4: Post harvest technology/techniques:

Post-harvest techniques are generally removed from Farming systems as they are not directly related to farming/cropping in the technical sense. Anyhow, the importance of blending this element with the above elements is that the identification of varieties for cultivation is based on the type of post-harvest technique envisaged of the said crop produce; eg. rice varieties have to be considered for each of the purpose in use ie. raw rice milled or parboiled rice milled for consumption. The qualities of the varieties have to differ to meet the varied purposes

of the users and therefore specific varieties have to be identified to meet these specific purposes.

Therefore, the necessity to consider post harvest technology/techniques as an integrated component of farming systems.

#### Element 5: Market links/Markets:

This element is vital when crop production is generally market oriented. As in the case of element 4 this element again determines the crops and the specific varieties that have to be cultivated at the field level. This influence of the markets on the crops and varieties is further extended to the field through the market demand for processed products of said crops. Therefore, the link of the market to the farming system is balanced based on the regular market forces, demand and supply, for crop produce and crop based products, to meet the need of the consumer.

In a commercial farming system the whole production process depends entirely on this element; to sustain the two way returns, income to the farmer-producer and the availability and choice of agricultural produce to the consumer at affordable costs.

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of social and political aspects, the introductions of the mechanisms as the market economy while dropping the regulating mechanisms of a planned economy including the relations with the third world, an alliance with the economic powers which exploit the third world and prevent its development.

From a political point of view the disarmament is surely positive for all but it also implies serious risks. Among others we see the fighting of local conflicts at the expense of popular struggle for emancipation, local governments being pressured to drop their political programmes such as the agrarian reform, the acceptance of geo-political distribution of the influence with a larger scope for the capitalist powers, a slowing down of the revolu-

tionary movements in the third world because solidarity is too expensive which in turn could lead towards a radicalisation of these movements and thus eventually to historical deadlocks. In one word, what should be feared is the reduction of political counterweight.

Finally at the level of reflection the fact that certain theoretical marxist expects have been given less evidence or even have been abandoned is not very promising. If imperialism as a stage of capitalism is no longer mentioned it also does no longer allow third world societies to re-integrate into the world system. The theory of transition could be weakened by a greater insistence on the ecology and the relationships with nature than on the social relationships.

These are a few fears of the third world and it looks as if the events of the recent months prove them right. Only the globalization of our analysis will keep us on the alert, ready to answer those questions.

In conclusion we would like to say that the marxist reflection has still a lot of tasks to accomplish. It is far from exhausted and could find new vigour. Moments of crisis are in fact privileged moments for renewal of the reflection. Besides, reflection can liberate itself from the institutional harness and take up once more its function of theoretical questioning of reality. The moment has come to develop reflection in untouched or nearly untouched fields such as culture.

(Cont. from page 33)