

CHAPTER VI

CONSTRAINTS AND BENEFITS TO CITRUS INTEGRATION

This study also aimed to assess and integrate the qualitative information as evaluated by farm households into quantitative evaluation framework in order to understand the economic viability and environmental (soil conservation) merits of the enterprises. The finding shows that incorporating orange as a system component may bring about several socioeconomic advantages such as increased income and environmental benefits (soil conservation) in comparison with annual crops.

Despite the potential economic benefits of orange, however, until now, its integration has not been very successful in Nepal's mid hill region. A number of socioeconomic and agronomic constraints may prevent farm households to adopt, integrate and expand orange into the present farm systems.

6.1 Constraints:

Descriptive assessments have been used to analyze the constraints to citrus integration by using farmers perception and views. The following information was obtained from the analysis of sampled farmers (Table 39).

Table 39. Farmers' Responses of the constraints to citrus integration into the existing Systems:

No.of Respondents	Percentage	Responses
20	16.25	Lack of land and small sized holding
31	25.25	Lack of knowledge and no technical information and incentives
29	23.25	No markets and infrastructures(Roads).
21	16.75	Lack of resources and funds (Capital)
5	4.50	Water constraints
10	8.50	Lack of family member(s) to manage and care trees
7	5.50	Lack of security of fruits from stray animals and local children
N=123 Total%		100

Responses of sampled households of both study sites i.e Patlekhet (Dandagaon, Aruboa, Panditthok, and Baniachhap villages) and Sankhu VDC's have been collected in order to trace out the major constraints that make the farm households not to adopt, integrate and expand the production of citrus in the existing traditional crop based systems. Tabular analysis of the above information based on farm sizes shows the following results (Table 40).

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Table 40 Percentage Scoring of the major constraints to citrus integration by farm size.

Farm Groups	Land	Labor	Capital	Market	Technology	Water	Output Security	Total
I	50	5	23	6	9	2	5	100
II	17	8	35	15	15	6	4	100
III	0	9	10	34	36	4	6	100
IV	0	10	2	38	40	3	7	100
Total	67	32	70	93	96	15	22	400
Percent(%)	17.0	8.5	17.5	23.2	24	4.0	5.5	100

From the above results it is inferred that different type of constraints are impeding in citrus integration for different farm size. Table 40 reveals that group I or marginal farmers (50%), responded that small size of land which was mostly devoted for grain crops was the major constraint in the integration followed by fund or capital unavailability. Where as group II reported lack of capital (35%) followed by land size (20%) as the major problem. The III or medium farmers reported technological information and market are the major constraints. The group IV (large or resource rich) farmers reported the lack of market (38%) followed by technological information(36%) as the major constraints to its adoption and integration. Lack of labor force to plant, care and manage, water constraints and also damage from stray animals and theft from local children are also reported to be constraints to some of the farmers.

Over all, as shown in figure 4, the main constraints observed were lack of technological information, poor marketing systems, lack of capital resources and land. However, smallholders (group I and II) may not foresee that technology will become a problem since the land is the serious constraints which obstructs them to move further for the long term investment in citrus fruit.

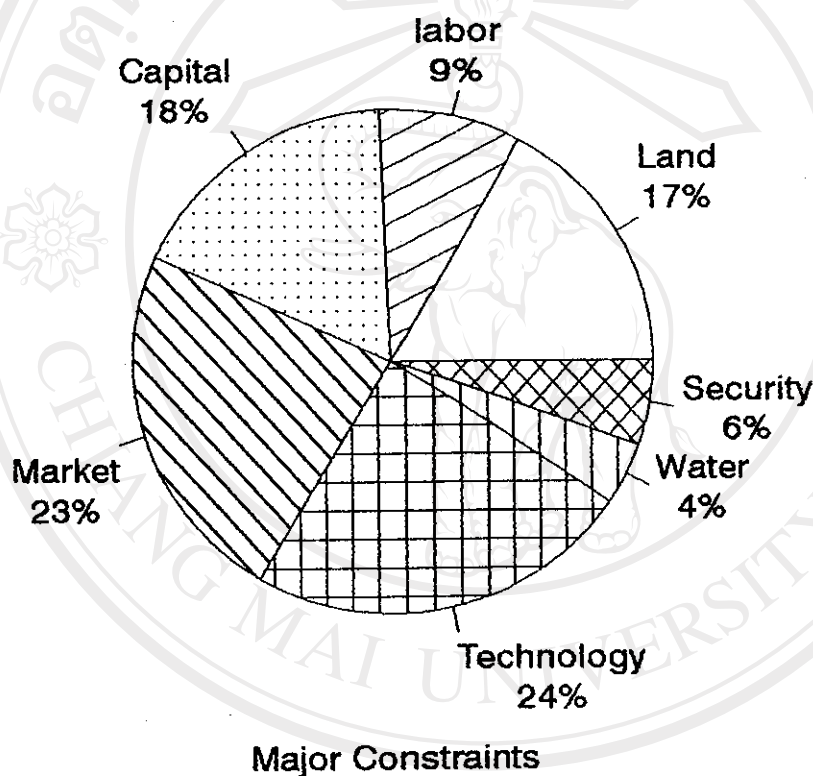


Figure 4. Constraints to Citrus integration
(Mean of four farm groups)

6.2. Discussion of major Constraints to Citrus Integration.

6.2.1. Land Constraints

The finding of this study showed that predominance of small holders in the middle hill region makes integration of orange fruits difficult because of their preference to grow annual crops that meet their immediate food and cash needs. In addition to this, many small scale farm households who do not have enough homestead lands (as lands allocated for fruit trees far away from home is difficult to care and manage and not fully secured) find difficult for citrus integration. Even though, small farmers who are innovative enough to adopt citrus trees, because of the small size of land, they need to go for intercropping of food crops during early years to compensate foregone production and income from annual crops by adopting citrus fruits.

Lack of land makes many small farmers difficult for getting institutional credit as the land is a main collateral used by the institutions (e.g. Agricultural development bank) for the disbursements of the credit. Though lack of tenurial rights for cultivation is also considered one of the major factors for fruit growing, this problem was not so pronounced in the study sites.

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6.2.2. Capital Constraints:

The findings from this analysis also revealed that lack of fund or capital resource is also observed as a major constraint to integration of citrus fruit particularly for the majority of marginal and small farmers. Uncertainties in the disposal of fruits make small farmers to sell their fruits to pre-harvest contractor in far below normal price. Furthermore, it is also found that farmers make contracts for selling fruits long before harvesting due to cash needs for inputs and household consumption requirements. Considerable variation was observed among small and larger farmers in the return per unit of output price received due to variation in the amount of capital owned. Large farm households received higher return as compared with small farm households as they have greater amount of working capital availability and greater access to credit for the direct marketing of fruits.

Despite, fruit farming is more profitable, it requires relatively bigger investments in the beginning and long time (5-6 years) to get expected return. This necessitates assistance for the farmers with the production and consumption credits in the absence of remunerative off-farm activities as their land used for their subsistence crop is lost. Unlike annual crops, fruit growing requires relatively high and timely availability of inputs. However, in the study sites, there is a limited availability of forest litters and compost and also the chemical fertilizers are expensive, difficult to afford and not available on time.

6.2.3. Labor Constraints:

Undoubtedly, improved farming for fruit trees such as orange is labor intensive, needs constant care and management skills to operate the orchard. However despite this, in Sankhu site, there is a low labor use in the existing orange production systems as more innovative, particularly active male members of the households who are involved in managing orange fruits were found to be involved in off-farm during off-season and also migrate seasonally to urban and other areas for off-farm work. This makes scarcity of active labor force during dry season where most of operation in citrus such as pruning, manuring, irrigation, plant protection and harvesting are carried out. Since, orange as being perennial crops require more constant labor input throughout the year than annual crops (which can be cultivated by seasonal out flow of labor in the rainy season), it is difficult to be adopted by farmers who seasonally migrate and find off-farm work more remunerative than farming in the village.

6.2.4. Marketing Constraints:

The analysis also revealed that lack of market and storage facilities for orange fruits have been found as the major constraints particularly to medium and large farmers. Because of seasonality, perishability and bulkiness of the citrus fruit, they need to be disposed off immediately after harvesting or processed into different forms like

concentrates, jam, jellies, marmalades and canned fruits. Lack of suitable low cost storage technology and processing facilities have made farmers difficult even to dispose off fruits in low price during the season. The price of fruits as reported by farmers goes off 2 -3 times higher during off- season than during harvesting time. This is also a major bottlenecks to fruit integration.

Furthermore, small farmers do not have bargaining power to market their limited produce in the fair price. This has resulted less expected return from their produce hence consequently, less interest towards fruit growing. The produce cannot be transported smoothly because of rough and improper road systems.

6.2.5. Technological Constraints

Since citrus fruits are not traditional to study areas, specific knowledge and skills about planting, care and management are required for its successful cultivation. Many plant materials presently supplied by the government farms and private nurseries are also not true to type and available easily. This has specially hindered for inexperienced farmers to adopt citrus. Better citrus cultivation technology in terms of improved varieties and improved husbandry practices are almost non-existent compared with cereals and other annual cash crops. Institution concerned with citrus research and development have put little concerns about its promotion in the socioeconomic circumstances of the small

farmers in the hills. The research and extension service with farming systems perspective is lacking since small farmers need special skills and knowledge to integrate it into the existing systems.

6.2.6 Socio-cultural constraints:

Sociocultural factors which have been placed in security constraints in (Table 40, Figure 4) also play some role in the integration of citrus in many of the rural hill areas of Nepal.

(i). There is still social taboo in the study sites to sell and market fruit by farmers themselves. Farmers hesitate to sell their own produce in the roadside or market it by carrying in the baskets. Fruit marketing and production is still regarded inferior vocation as compared with other forms of trade and services.

(ii). Many villagers in the study site including in many mid hill areas still do not respect the right of ownerships of the ripening fruits. When tree starts bearing fruits local children and even adults do not hesitate to pick up the fruits before it is sufficiently ripe to harvests for market. There is no incentives to plant few fruit trees in many of the rural areas of Nepal. Changes in attitudes will be required to encourage farmers to invest in fruit trees.

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(iii). Some farmers also do consider that free grazing of livestock is a problem for citrus integration. The costs of fencing to keep animals out of orchard is expensive and can exceed all other initial production costs.

Biophysical constraints such as climatic suitability, low soil fertility, Water availability and disease and pests are also the major factors that impede citrus integration in the existing systems. However, these factors are not analyzed as it is beyond the scope of the study and it is found that the study areas are suitable in terms of climate, soil and other biophysical factors for growing citrus fruits.

6.3 Summary

This study shows that technological information that is improvement in extension services (technical know-how) and market development could substantially attract small farmers for the integration of citrus into the existing systems. Similarly, improvement in existing credit supply policy and transaction process also expected to have significant role in the promotion of citrus since, initial capital investment and long time lag before seeing return also play important role. The constraints of labor force to care and manage, water constraints, and damage from stray animals and theft from local children, however, are not the major ones which could be alleviated through more capital investment on labor force and water supply and fencing through flexibility in credit supply and transaction.

6.4. Assessment of the benefits of the citrus integration

6.3.1. Economic Benefits

The citrus based production system has been existing since more than a decade in Sankhu site where farmers have fully integrated it into their existing crop based systems because of the perceived economic and financial benefits of the orange enterprise at the households. It is obvious from the views collected from households (Table 41) that orange production is highly profitable to competing crop maize in the upland. This view collected from the farmer also verifies the optimal solution of the programming model.

Table 41. Views of farm households about orange and its profitability.

No Of Respondents	%of total	Extent of profitability
33	63	Three times more profitable to maize
12	23	Two times more profitable to maize
7	14	Equally profitable as to that of maize
N = 52		

Source: Household survey, 1993

Apart from this, results of matrix ranking also substantiate the superiority of orange production to increasing farm income and improving other socioeconomic and environmental conditions as compared with existing field crops and livestock (Appendix Table 7).

6.4.2. Soil Conservation merits

It is reported that fruit trees are good for soil conservation (Nair, 1986). The empirical results suggest that orange tree at full maturity can reduce soil erosion three times more than maize crop at 5-6% slope (Phien, 1988). Sampled farmers in the study sites also do recognize the importance of tree crops in soil conservation. In view of understanding the farmers views and perception about soil conservation, sampled farmers were asked to what extent citrus trees can reduce soil erosion as compared with common competing annual crop maize. The Table 42 shows that majority of the farmers considered that orange tree can reduce soil erosion effectively when it is in full growing stage.

Table 42. Farmers perception of using citrus trees as Soil conservation measures.

Type of crop	Number of Farmer	% Farmer	Effectiveness
Orange	25	47.16	Very effective
	20	37.77	Some effect
	8	0.15	No effect
N = 53			
Maize	10	18.86	Some effect
	22	41.50	No effect
	21	39.62	Negative effect
N = 53			

However, a very high percent of farmers view that maize crop instead of soil conserving enhances soil erosion. While few percent of

farm households consider citrus has no effect on checking soil erosion. However, in case of maize, a significantly higher per cent of farmers had considered that maize has no effect on soil erosion control.

Mostly degradation of land is found to occur because of the low profitability of the existing farming systems. The experience of many farmers in Sankhu site after a decade of fruit farming revealed that use of highly profitable fruit trees like mandarin orange into the existing farming systems could reverse the degradation process because of higher cash income obtained from orange which would favor more conservation work on existing agricultural land as resource is now more valuable. Furthermore, citrus integration can have several other social and nutritional benefits to rural farm households such as improvement in health, aesthetic pleasure to farm families and society, ecosystem stability etc. which are not accounted in this study.

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