5

PRODUCTION FLOW : LINKAGES AMONG COMPONENTS OF MOUNTAIN FARMING SYSTEMS

Backward and Forward Linkages

Crops (including horticultural crops), livestock, and forestry have been identified as the three most essential components of the mountain farming systems in all three study sites. A farmer or a household manoeuvres these three components with his/its management skills in order to extract outputs that can be generated from each component. Market forces are more recent influences that shape a particular type of farming system in the mountains. These components are so much interwound that one can hardly think of a farming system in the absence of one component. The only fact is that the magnitude of the attributes of these components differs as per the variation in altitude, microclimates, and other socioeconomic settings. This section of the chapter, thus, will attempt to analyse the direction and magnitude of the production flow of inputs and outputs from one component to another with the help of matrices. The implications of variations in production flow in different study sites will be dealt with in subsequent sections and chapters as well. Three different types of matrices (presented in Tables 5.1, 5.2, and 5.3) form the basis for discussion in this section.

Crops and Livestock

A strong linkage does exist between the crop and livestock sectors of a farming system; the production of one component without the other is either very difficult or unsustainable in the mountains. Crops cultivated in farmland provide a very important source of fodder to animals. This is depicted clearly in Tables 5.1, 5.2, and 5.3. Weeds and other grasses, including tree fodder derived from farmland, form green fodder. However, crop by-products (e.g., paddy, wheat, barley and millet straw, maize stover, etc), called dry fodder, also constitute a major source of animal nutrition. In addition, cereal grains which come from the crop sector are also fed to selected productive animals (e.g., milch/draft animals) in order to derive more milk and animal power. If a farmer at Naubise provides 275 kg of grain (e.g., rice, maize, wheat, barley, millet, etc) to animals in the form of concentrated feed then the figures for Dhuskun and Yelung are estimated at 51 kg and 9 kg respectively (Tables 5.1, 5.2, and 5.3). Livestock farming is heavily dependent upon crops (or farmland), particularly in the Naubise area where about 90 per cent (2,193 kg TDN) of the total animal feed comes from farmland alone.

The livestock component also provides essential inputs to crops for their production and development. In this respect Tables 5.1, 5.2, and 5.3 are self-explanatory. Livestock, in fact, supply manure which is the only source for maintaining soil fertility, particularly in Yelung and Dhuskun where chemical fertilizers are either non-existent or little used. Hence, crop production without livestock rearing is extremely difficult in the mountain region. As indicated by the matrices, the livestock component provides fresh dung (manure) to the tune of 12.8 MT, 8.1 MT, and 10.1 MT in Naubise, Dhuskun, and Yelung respectively. The present manure application rate per hectare of cropped area is extremely high in Yelung (31.5 MT), whereas the figures for Dhuskun and Naubise are only 8.8 MT and 8.0 MT respectively.

Another very relevant attribute from livestock to crop production is animal power which is mainly used for land preparation. The use of animal power varies from one study site to another, depending upon the cropping pattern and intensity, soil type, soil moisture content, and availability of bullock power. An estimation based on field data indicates that on an average a farm household uses a total of 98 animal days at Naubise, 56 animal days at Dhuskun, and 24 animal days at Yelung. Whereas the number of animal days per hectare of cropped area is calculated at 61 each for Naubise and Dhuskun and 75 for

Table 5.1: Matrix Showing Linkages among the Components of the Crop-dominated Farming System at the Dhuskun Site (Per Average Household Per Annum)

Production Sectors	Flow Direction	Consumption Sectors				
		Crops	Livestock	Forest/Pasture	Household	Market
Crops (0.54 ha)						
- Cereals (1241 kg)		34 kg (seed)	51 kg (conc.)	-	1049 kg	61 kg[1] 27 kg (rent)
- Oilseeds (5 kg)	▶			-	2 kg	19 kg
- Crop residue (1850 kg)		-	-	-	72 kg (fuel)[3]	(wage)[2]
- Compost materials (127 kg)		-	1778 kg	-	-	3 kg
- Tree fodder (100 kg)		127.0	-	-	-	-
- Grass fodder (3392 kg)		kg -	100 kg 3392 kg	-	-	- -
		-				-
Livestock (2.70 LSU)						
- Milk (28 litres)	▶	-	-	-	28 litre	-
- Fresh manure (8,898 kg)		8119	-	779 kg	-	-
- Draft power (56 ad)		kg	-	-	-	-
- Live animals (Rs 63)		56 ad	-	-	-	Rs 63
		-				
Forest/Pastures (0.54 ha)						
- Tree fodder (61 kg)		-	61 kg	-	-	-
- Grass fodder (2219 kg)		-	2219 kg	-	-	-
- Grazing (327 kg TDN)[4] or (686 hrs)	▶	-	327 kg TDN	-	-	-
- Compost material (320kg)		320 kg	-	-	-	-
- Bedding materials (757 kg)		-	757 kg	-	-	-
- Fuelwood (2572 kg)		-	-	-	2572 kg	-
Household (5.07 family size)						
- Labour (520 md)	▶	161 md	265 md	-	-	Cash (Rs 3893[5]) (94 md[6])
Market						
- Credit (Rs 1036)		Rs 145	Rs 300	-	Rs 591	-
- Off-farm income (Rs 2569)		-	-	-	Rs 2569	-
- Cereals (76 kg)		3 kg	13 kg	-	60 kg	-
- Fertilizer (33 kg)	▶	(seeds)	(conc.)	-	-	-
- Labour (3 md)		33 kg	-	-	-	-
- Animal purchases (Rs 52)		3 md	-	-	-	-
- Other inputs (Rs 52)		-	Rs 52	-	-	-
- Consumer goods and services (Rs 2379)		- -	Rs 52 -	-	Rs 2379	-

Note : TDN = Total Digestible Nutrient; conc. = concentrated feed; md = mandays; ad = animal days.
See page 49 for remarks and footnotes related to all three matrices (Tables 5.1, 5.2, and 5.3) displayed at the end of this chapter.

Table 5.2: Matrix Showing Linkages among the Components of the Horticultural Crop-dominated Farming System at Naubise Site (Per Average Household Per Annum)

Production Sectors	Flow Direction	Consumption Sectors				
		Crops	Livestock	Forest/ Pasture	Household	Market
Crops (0.97 ha)						
- Cereals (2658 kg)		74 kg(seeds)	275kg(conc)	-	1662 kg	373 kg+95 kg (rent)[1]
- Oilseeds (29 kg)		1 kg	-	-	8 kg	179 (wage)[2]
- Sugar cane (596 kg)		162 kg	-	-	24 kg	20 kg
- Potato (176 kg)		-	-	-	80 kg	410 kg
- Fruits (647 kg)		-	-	-	291 kg	96 kg
- Vegetables (2892 kg)		-	-	-	150 kg	
- Crop residue (3591 kg)		-	2883 kg	-	708kg(fuel)[3]	356 kg
- Compost materials (820 kg)	▸	820 kg	-	-	-	2741 kg
- Bedding materials (533 kg)		-	533 kg	-	-	-
- Tree fodder (497 kg)		-	497 kg	-	-	-
- Grass fodder (4275 kg)		-	4275 kg	-	-	-
- Fuelwood (2092 kg)		-	-	-	2091 kg	-
- Roofing materials (69 kg)		-	-	-	69 kg	-
Livestock (4.19 LSU)						
- Milk (407 l)		-	-	-	335 litre	72 litre
- Fresh manure (13,297 kg)	▸	12,811 kg	-	486 kg	-	-
- Draft power (110 ad)		98 ad	-	-	-	12 ad
- Live animals (Rs 682)		-	-	-	-	Rs 682
Forest/Pastures (0.20 ha)						
- Compost materials (426 kg)		426 kg	-	-	-	-
- Bedding materials (650 kg)	▸	-	650	-	-	-
- Grazing (220 kg TDN)[4] or (298 hrs)		-	220 kg TDN	-	-	-
- Fuelwood (1417 kg)		-	-	-	1417 kg	-
Household (7.13 family size)	▸					Cash (Rs 17,076[5])
- Labour (724 md)		270 md	224 md	-	-	230 md[6]
Market						
- Credit (Rs 5818)		Rs 2093	Rs 1300	-	Rs 2425	-
- Off-farm income (Rs 5421)		-	-	-	Rs 5421	-
- Cereals (147 kg)		8 kg	12 kg (cont)	-	127 kg	-
- Potato (29 kg)		29 kg	-	-	-	-
- Meat (5 kg)		-	-	-	5 kg	-
- Vegetables (9 kg)		Rs 183	-	-	9 kg	-
- Fertilizer (340 kg)	▸	340 kg	-	-	-	-
- Pesticides (Rs 361)		Rs 361	-	-	-	-
- Labour (71 md)		71 md	-	-	-	-
- Draft power (34 ad)		34 ad	-	-	-	-
- Animal purchase (Rs 1301)		-	Rs 1301	-	-	-
- Other (Rs 618)		-	Rs 618	-	-	-
- Other inputs (Rs 662)		-	Rs 662	-	-	-
- Consumer goods and services (Rs 9355)		-	-	-	Rs 9355	-

Table 5.3: Matrix Showing Linkages among Components of the Livestock-dominated Farming System at Yelung Site (Per Average Household Per Annum)

Production Sectors	Flow Direction	Consumption Sectors				
		Crops	Livestock	Forest/Pasture	Household	Market
Crops (0.28 ha)						
- Cereals (312 kg)	▶	17 kg	9 kg	-	282 kg	4 kg rent[1]
- Potato (348 kg)	▶	68 kg	-	-	249 kg	31 kg
- Crop residue (526 kg)	▶	-	510 kg	-	16 kg (fuel)[3]	-
- Compost materials (48 kg)	▶	48 kg	-	-	-	-
- Tree fodder (187 kg)	▶	-	187 kg	-	-	-
- Grass fodder (4568 kg)	▶	-	4568 kg	-	43 kg	-
- Fuelwood (43 kg)	▶	-	-	-		-
Livestock (7.41 LSU)						
- Milk (608 litre)	▶	-	-	-	191 litre	147 litre
- Meat (16 kg)	▶	-	-	-	16 kg	-
- Fresh manure (26,673 kg)	▶	10,142 kg	-	16531 kg	-	-
- Draft power (24 ad)	▶	24 ad	-	-	-	-
- Live animals (Rs 682)	▶	-	-	-	-	Rs 682
Forest/Pastures (3.0 ha)						
- Compost materials (548 kg)	▶	548 kg	-	-	-	-
- Bedding materials (797 kg)	▶	-	797 kg	-	-	-
- Tree fodder (5202 kg)	▶	-	5202 kg	-	-	-
- Grass fodder (987 kg)	▶	-	987 kg	-	-	-
- Grazing (5,093 kg TDN)[4] or 2018HRS	▶	-	5083kg TDN	-	-	-
- Fuelwood (2,977 kg)	▶	-	-	-	2977 kg	-
Household (5.5 family size)						
- Labour (969 md)	▶	66 md	777 md	-	-	Cash (Rs 995 126 md[6])
Market						
- Credit (Rs 4,144)	▶	-	Rs 3034	-	Rs 1010	-
- Off-farm income (Rs 4,621)	▶	-	-	-	Rs 4621	-
- Cereals (394 kg)	▶	-	39 kg (conc)	-	355 kg	-
- Vegetables (7 kg)	▶	-	-	-	7 kg	-
- Meat (4 kg)	▶	-	-	-	4 kg	-
- Other inputs (Rs 25)	▶	-	Rs 25	-	-	-
- Animal purchase (Rs 2,955)	▶	-	Rs 2955	-	-	-
- Consumer goods and services (Rs 4,632)	▶	-	-	-	-	-
Other (Rs 198)	▶	-	-	-	Rs 4632	-
	▶	-	Rs 198	-	-	-

Yelung. Another reason behind higher use of animal days per hectare of cropped area in Yelung is the lower (115) cropping intensity compared to Dhuskun (171) and Naubise (165). These figures also imply that the use intensity of animal power, perhaps, largely depends on the availability of draft animals. A farmer in Naubise, for instance, keeps 0.53 bullocks, for draft power and in Dhuskun and Yelung farmers keep 0.56 and 1.07 bullocks respectively for the same purpose.

Crops and Forestry

As such, there is no direct two way link (production flow) between crop and forestry components. Compost material particularly comes to crop production from the forestry sector and is again a vital source of plant nutrients and its collection and application depends upon a number of factors. Some of them are availability of family labour and the extent of its necessity, depending on total cropped area, cropping pattern, and the magnitude of the availability of compost material. These can be the reasons for the difference in application rates in various localities in the mountains. On an average, one farm household with 0.97 ha of land is estimated to have applied 426 kg of compost material in Naubise and 320 kg and 548 kg in Dhuskun and Yelung on 0.57 ha and 0.28 ha of landholdings respectively.

Livestock and Forestry/Pastureland

There is a strong relationship between livestock and forestry/pastureland. The latter sector provides green fodder (e.g., tree fodder, grasses) and bedding materials required for animals. As Tables 5.1, 5.2, and 5.3 reveal, on an average, a farm household is estimated to have extracted about 800 kg, 750 kg, and 650 kg of bedding materials from the forests in Yelung, Dhuskun, and Naubise respectively. Grazing on forest/pastureland constitutes a major source of animal feed, particularly at the Yelung site where about four-fifths of the total animal feed are derived from this sector due to the existence of good alpine pastureland and meadows (Table 4.13).

The importance of forest and pastureland in relation to livestock farming is higher for the livestock farming system study site. It has been estimated that about 10 per cent of the total animal feed comes from the forestry and pastureland sector in the Naubise area, whereas the figures for Dhuskun and Yelung sites are about 30 per cent and 90 per cent respectively (Table 4.12).

For its indemnification, livestock provides manure to the forestry and pastureland to some extent. Animals during grazing are calculated to leave about 800 kg of fresh dung at the Dhuskun site, about 500 kg at Naubise, and over 1,600 kg at the Yelung site.

Linkages with Farm Households

Farm households are deriving various farm outputs from different components of the farming system with their labour inputs and management skills.

Farm households have produced some cereals, oilseeds (mainly mustard), potatoes, and cash crops, including fruits and vegetables, at least for home consumption. Farmers in some mountain areas also seem to have disposed their limited farm outputs for cash income which is expended in meeting demands for other necessary commodities. Out of the total cereal grain production, from less than a hectare of land (0.97 ha), an average farm household in Naubise is estimated to consume 1,662 kg of cereals, 80 kg of potatoes, and fruits and vegetables to the tune of 291 kg and 150 kg respectively. Similarly, households with a family size of 7.13 are estimated to consume 335 litres of milk in the form of fluid milk, ghee, butter, and curd and to use 2,091 kg of fuelwood annually.

The average per capita/annum fuelwood consumption is estimated to be about 298 kg in Naubise, 521 kg in Dhuskun, and 552 kg in Yelung. Crop by-products and farm trees meet almost all the demand for fuelwood in Naubise. Whereas in Dhuskun and Yelung, the forests are the main suppliers of fuelwood. The quantity of crop by-products used as fuel is as high as 708 kg per household in Naubise compared to 72 kg and 16 kg in Dhuskun and Yelung respectively. Farmers, particularly in accessible areas (e.g., accessible by road or market), also use kerosene mainly for lighting purposes. The annual kerosene consumption rate was not recorded in any of the study areas, nevertheless the reason behind the lowest per capita fuelwood consumption in Naubise is the higher rate of kerosene used.

The per capita fuelwood consumption is higher in Dhuskun compared to Naubise and Yelung. Farmers use fuelwood for many purposes (e.g., cooking, lighting, and even heating) in Yelung because of the cold climate. Fuelwood for heating is required in the other two study areas for shorter time periods only during winters. Moreover, people's food habits also guide the fuelwood requirement. For instance, people in Yelung brew beer and alcohol and this is one other reason why the per capita fuelwood consumption is higher there.

Linkages with the Market

The integration of farm activities with the market is increasing over time, although the scale of integration not only differs with the type of activity but also with the specific areas, depending upon accessibility and inaccessibility. Because of the strong market forces in Naubise, diversification and intensive crop cultivation have become possible. As a result, both the productivity and the total production of cereals as well as horticultural crops (newly introduced and diversified crops) have increased despite the fact that the compost and manure availability per hectare of cropped area is low compared to other study areas. Due to the presence of relatively good market infrastructure, the farmers at Naubise do not face the problem of selling their products nor the difficulty in obtaining agricultural inputs, which include chemical fertilizers, improved seeds, pesticides, and fruits and vegetable seedlings and saplings.(Tables 5.1, 5.2, and 5.3). This situation (particularly the case of chemical fertilizer availability) has released the forests from great pressure for compost materials. Similarly, farmers adopted increased stall-feeding practices realising that there is good market potential for milk and its products. This is exhibited by the increasing trend of replacing cattle with better quality buffaloes and the consequently higher amount of milk sold at Naubise (720 litres) compared to Yelung (about 420 litres) and Dhuskun (no sale at all). Higher agricultural production potentials and their linkages with the market at Naubise are also due to relatively larger farm sizes (Table 4.3) and better irrigation facilities (Table 4.5) compared to the other two study areas.

Market integration is weakest in the Dhuskun area. This is probably one of the reasons why the farming system in this area is more critical in terms of low or declining productivity; neither is the market able to supply chemical fertilizer to supplement and redeem the increasing loss of compost materials from forests nor are the farmers able to diversify their crop production to generate income as in Naubise.

In the case of Yelung, the livestock component of the farming system seems to be closely linked with the marketing system of the area. The marketing of milk products is linked with the Dairy Development Corporation (DDC) which purchases milk from farmers through the Cherdung Cheese Factory established in Jiri and its sub-branches located in Yelung area. This factory provides some necessary inputs in terms of veterinary services, and assists farmers to obtain credit.

While the farm households are almost solely dependent upon markets for consumer goods and services at all study sites, the market's role as supplier of food (e.g., cereal grains) is most pronounced in Yelung where about 40 per cent of the total household annual food consumption is obtained from the market.

Implications of the Linkages

As discussed earlier, various outputs have been generated as a result of the integration of different components of the farming system. Some of the outputs obtained from one component have been used in other components in the form of inputs for deriving outputs from the latter and vice-versa. This section will throw some light on the implications of the linkages in terms of nutrition, employment, and income.

Nutrition

The nutrition status of the people has been assessed in terms of calorie intake. The per day, per capita calorie intake rates are estimated at 2,012, 1,748, and 1,326 for Naubise (horticultural crop-based farming system), Dhuskun (cereal crop-based farming system), and Yelung (livestock-based farming system) respectively (Table 5.4). Food crops (mainly cereals) predominate over all other sources (e.g., fruit and vegetables, livestock) of calorie supply in all study sites and their share ranges from about 90 per cent (in Naubise) to 99 per cent (in Dhuskun) of the total calorie intake (Annex 7) Livestock-based food products appear to be the second major source and their share in the total calorie intake ranges from one per cent in Dhuskun to a little over eight per cent in Yelung. The contribution of fruit and vegetables is virtually nil except in Naubise where the figure is estimated at 3.8 per cent.

Table 5.4: Calorie Intake Per Capita Per Day by Source and Study Site

	Dhuskun		Naubise		Yelung	
	Calorie	%	Calorie	%	Calorie	%
Food Crops (Cereals mainly)	1733	99.0	1804	89.7	1221	92.0
Fruit and Vegetables	-	-	77	3.8	1	0.0
Animal Food	15	1.0	131	6.5	104	8.0
Total	1748	100.0	2012	100.0	1326	100.0

Source : Household Survey, APROSC 1989.

Income

Cash Income. The sale of agricultural and livestock products is the immediate source of cash income for farm households in all study areas. However, the contribution to the total cash income from various components or activities of a farming system vary from one area to another. In Naubise, for example, horticultural crops on an average constitute about 80 per cent, whereas cereal crops and livestock each contribute about 10 per cent to the annual farm cash income (Rs 21,460). The share of cereal crops and livestock in the total cash income in Dhuskun is about 53 and 47 per cent and in Yelung about 2 per cent and 98 per cent respectively (see Annex 4, Table 1).

Income generated from off-farm employment is very important in all study areas, particularly in Dhuskun, where most of the cash income comes from 'sideline' activities (96% of the total income). Based on field data, it is estimated that an average farm household derives a total annual cash income to the tune of Rs 39,166, Rs 4,028, and Rs 15,302 in Naubise, Dhuskun, and Yelung respectively (Annex 4, Table 2).

Gross Income. The quantification of the components of mountain farming systems is one of the vital issues that this study attempts to deal with. In this context, we know that, as expected, if fruit and vegetable production dominated the farming systems in Naubise then cereal crops in Dhuskun and livestock in Yelung, based on income generated by cash components of the system. However, our job may not be complete unless we also quantify the contribution of forests which are a vital component of the mountain farming system. In addition, cash income alone cannot fully and properly appreciate the linkages among the components of the system, and this is revealed in subsequent discussions. In response to this issue, a gross income analysis is made and discussed below.

Table 5.5 depicts that the estimated total annual gross income per average household is highest (Rs 52,022) in Naubise or the horticultural crop-dominated farming system area. This is mainly because of the income generated through the sales of fruits and vegetables (over 40 % of the total income). The figures for Yelung and Dhuskun areas respectively are computed at about Rs 19,000 and Rs 13,000. Based on this gross income analysis, if the cereal crop component claims the highest share (41%) of the total income for the cereal crop-dominated farming system (Dhuskun area) then livestock (55%) does so for the livestock-dominated farming system.

Table 5.5: Total Annual Gross Income Per Household by Source and Study Site

Income in Rs
Proportion in %

Farming System	Dhuskun		Naubise		Yelung	
Components	Rs	%	Rs	%	Rs	%
Cereal Crops	5226	41.0	15439	29.7	3227	17.1
Horticultural Crops	-	-	20925	40.3	-	-
Livestock	4515	35.4	14068	27.0	10395	55.0
Forestry/Pastureland	3016	23.6	1550	3.0	5272	27.9
Total	12757	100.0	52022	100.0	18894	100.0

Source : Household Survey, APROSC 1989.

Table 5.5 also indicates that all the three different types of farming system are basically crop - livestock - forestry integrated systems, although the forestry sector is loosely linked in the case of Naubise. This can be attributed to the strong market integration of the farming system. The highest (28%) contribution from the forestry sector is in Yelung. This is one of the main reasons why the livestock sector is performing so well in Yelung and it dominates the overall components of the system.

It should be recognised that all components (e.g., crop, horticulture, and livestock), apart from forestry, are substantively contributing to the farming system in Naubise and that the gross incomes* generated from each component are higher than those for the other two sites. This can be attributed not only to larger farm sizes (average farm size is 0.97 ha) with a greater proportion of irrigated land (Table 4.5) but also to greater accessibility to modern technology (e.g., HYVs, improved animals), along with agricultural inputs (e.g., seeds, fertilizers, pesticides, credit, etc), and a wider market (Kathmandu Valley).

Employment

The matrices (Tables 5.1, 5.2, and 5.3) indicate that farm activities are the major source of employment in all study sites. They provide 82 per cent, 68 per cent, and 87 per cent of the total employment days of 520, 724, and 969 per average farm household in Dhuskun, Naubise, and Yelung respectively. The rest is provided by off-farm activities which include services, business, construction, portering, etc. Within the farm, crops (e.g., cereals) contribute about 40 per cent of the total employment generated in Dhuskun, horticulture combined with cereal crops contribute about 55 per cent in Naubise, and livestock provides over 90 per cent in Yelung. The matrices also indicate that livestock has remained one of the vital components of the mountain farming system as far as employment generation is concerned. It has generated about 45 per cent in Naubise, 60 per cent in Dhuskun, and is overwhelmingly predominant in Yelung.

The employment opportunities provided by the market are highest in Naubise, followed by Yelung and Dhuskun. The per household average number of mandays employed annually in off-farm activities ranges from 94 in Dhuskun to 230 in Naubise. Construction work (e.g., Lomosangu-Bahrabise road) and business are the two major 'sideline' activities in Dhuskun; the former is the major contributor to employment and the latter to income. Compared to other study areas, these two off-farm activities in Dhuskun appear to be temporary and unpredictable since the road construction is now over and the income generated through business** largely depends on the attitude of the customs' people stationed at the Nepal-Tibet border. Tourism appears to be one of the major 'sideline' activities, particularly in Yelung which lies on the trekking route (Junbesi, Lukla, Namche Bazar) to Mt. Everest starting from Jiri. Many people in the area work as porters and trekking guides for tourists.

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* While computing **gross income**, all the commodities (e.g., both main as well by-products) produced by each component (e.g., cereals, horticultural crops, livestock, and forestry) of the farming system have been converted into their value terms by multiplying the total amount of produce with their respective prices. The opportunity costs of the family labour for each farming system are considered as **proxy** for non-tradable commodities (e.g., fodders, compost, and bedding materials).

** As per the agreement between the Government of Nepal and Tibetan Autonomous Region of the People's Republic of China, Nepalese people residing within a periphery of 26 km of the Nepal-Tibet border, which encompasses the Dhuskun area, are entitled to import a few items of basic necessities (e.g., food items, shoes, umbrellas, a few metres of cloth,) from Khasa in Tibet to Nepal without any customs and duties. However, it is interesting to observe that people, particularly during the winter or off-season, when agricultural activities are few import these items very frequently; some people ferry almost every day. They sell these items in the local markets (e.g., Lamosangu, Bahrabise) and make an attractive income.

Remarks

1. The above-discussed matrices (Tables 5.1, 5.2, 5.3) depict the direction and magnitude of the input and output flow from the production (those major activities or components which produce outputs in terms of volume or value terms; e.g., crops, livestock commodities, etc) to the consumption (those components which consume the inputs on outputs) sector of three different types of farming systems, for example, cereal crop-dominated (Table 5.1), horticultural crop-dominated (Table 5.2), and livestock-dominated (Table 5.3).

2. The input and output flow shown in the matrices are indicative of one complete year in an average farm household for each type of farming system as discussed in (1).

3. The figures in parentheses are the total amounts of output in terms of volume or value produced/consumed by the production/consumption sectors.

4. Cereals, which include paddy, maize, wheat, millet, barley, and buckwheat, are being used for home consumption in terms of food, concentrates for animal feed, seeds for crop cultivation, for rental payments to landlords, and wage payments to hired labour in kind.

5. The figures that are shown under the market column are from the sale of commodities, cash expended in markets for buying household necessities, etc.

Footnotes

1. Payment of rent to landlords from tenant farmers.

2. Payment in kind to hired labour.

3. Crop residues are also being used as fuel; this situation arises when the supply of fuelwood is scarce.

4. The indicated amount of animal feed in terms of TDN is estimated to be consumed by animals in the form of green grass and fodder during grazing in forests, on pasturelands, and along river banks. The total number of hours spent per year in grazing is also given in the tables.

5. Includes all cash expenses incurred in purchasing various household and other commodities and items.

6. The total number of mandays involved in off-farm activities.