Chapter 4

Diversification of Livelihood Options - Range and Quality

Range of Options

Households adopt various economic activities, mainly for subsistence and to secure a sustained flow of income. Resources at their command are allocated to these activities in such a way as to maximise the production and income flow and keep the associated risks at a minimum or at an acceptable level. Along with the urge for higher incomes, resource endowments are also crucial in determining the household's economic behaviour, at least in the short run. Economic activities adopted by the households in Ilam have been classified into 12 groups for measurement and analysis of diversification of household production options. They mainly represent the economic options adopted by the households. Both land-based and non-land based activities are included in these production options or economic activities. A brief discussion on the production options being adopted by the households in the survey area of Ilam follows.

1. **Cereal Crops:** Rice, wheat, maize, barley, millet, and oil seeds are considered as cereal crops and their production as one production option. Cereal crop cultivation by and large uses traditional methods and inputs. Use of synthetic inputs is minimal. New high-yielding varieties of rice, wheat, and maize are increasingly being adopted. However, the use of seeds from home farm production is common, hence, seeds are high-yielding types but local in a real sense. This production option, though not considered to be superior in terms of generating income and employment, is an important activity for household food security.

2. **Tea**: Tea plantation, though introduced more than a century ago, has become popular at the farm household level only recently. Tea plantations are not limited to large tea estates only in Ilam; individual farmers are increasingly allocating more and more land to tea. Uncultivated and, lately, even some crop lands are being planted with tea. Proliferation of small tea growers has been induced by the emergence of tea processing and procuring units at the private level.

Tea is grown mainly for cash income, therefore it is considered to be a superior economic activity as it fetches a good cash income.

3. **Cardamom**: Cardamom plants do well in agriculturally unsuitable gully, shady, and moist lands. All farmers have some land like this in varying proportions, and have invariably filled it with cardamom plants over the last decade. Gradually cardamom cultivation is being extended on to other, agriculturally suitable land also.

   Cardamom cultivation is one of the oldest non-traditional economic enterprises at the household level. Cardamoms have been grown for more than three decades, mainly for cash income. Despite disease infestations and marketing and pricing problems, it is still one of the main sources of cash income in Ilam.

4. *Amliso*: *Amliso* (broom grass) grows well on marginal land such as the bunds and ridges of farm terraces. Hence, it does not compete with cereal crops for land. It yields fodder for animals, fuelwood, roofing materials for household use, and broom for cash income. Grown mostly for fodder purposes, the gradual development of transport facilities in Ilam, and markets for broom in neighbouring Indian states and in the *Terai* towns of Nepal, broom grass is now grown for harvesting also. Currently, broom grass production is one of the major income-generating activities in Ilam. Farmers have been extending broom grass farming on to terraces, replacing cereal crops. The complementary character of broom grass, especially with the livestock sector, has been a key element in the expansion of broom grass and the dairy sector in Ilam. Besides being a high income-generating activity, it generally helps to conserve and protect the natural resource base by checking land degradation, on the one hand, and relieving pressure on forests and pasture lands on the other.

5. **Ginger**: Ginger farming for domestic use was common earlier also, but recently, cultivation for commercial purposes has been on the increase. Grown in maize fields (*bari*) with intensive use of compost and traditional methods, ginger competes with cereal crops in terms of land allocation. The high profit margin from ginger has increasingly encouraged farmers to grow it.

   Ginger cultivation is generally influenced by externalities such as overseas' marketing and pricing. The ginger produced in Ilam is exported to Europe via Indian cities and towns, e.g., Silguri and Calcutta.

6. **Sericulture**: Sericulture, though introduced quite recently in some parts of Ilam district, has promising potential. Farmers have taken a great interest in planting mulberry which is needed to feed silk worms. With some technical and financial support, farmers have not hesitated to convert their crop land into mulberry plantations. It is anticipated that Ilam could become a major sericulture farming

area in Nepal in the future, once farmers start to receive income from the existing preliminary stages of sericulture development. However, cultivation of mulberry is very limited at the moment.

7. **Potatoes**: The potato is a traditional cash crop of Ilam, grown mainly for household consumption. With gradual improvements in accessibility to markets within and outside the district, commercial production of potatoes has increased tremendously. Potatoes also compete with cereal crops for farm land. High yield rates and consequent higher returns have induced farmers to switch over to potatoes.

8. **Horticulture**: Fruit and vegetable farming is included in this option. Horticulture is practised on a very limited scale in Ilam and generally in areas where transport facilities are easily available. Unlike various agriculturally transformed hill areas of Nepal and the Indian hill states, horticulture is not a key factor for economic transformation in Ilam. However, the importance of growing off-season vegetables is now slowly increasing due to the demand for them in adjoining Nepalese and Indian markets. It is likely that, with ease in transport, growing off-season vegetables will become popular over time.

9. **Dairy Farming**: Dairy farming has now become a major source of income in some selected pockets of Ilam due to improved fodder resources (e.g., broom grass, improved grass cultivation, etc) at the farm level. More importantly, direct and guaranteed access to processing facilities (e.g., presence of a cheese factory in Pashupatinagar, Ilam, and a powered milk factory in Biratnagar) has encouraged dairy farming to such an extent that, unlike most developing pockets of the economy, the traditional seasonal variation in milk supply does not exist any more. Consequently, milk production and supply are constant throughout the year. Thus, there are incentives for both producers and processors of milk. It seems that dairy farming will flourish well in the future.

10. **Livestock Farming**: Local livestock raising has not been completely abandoned. Most farmers are found to have raised improved and local breeds together, particularly in relatively remote areas. Local cattle yield little milk and are mainly raised to obtain draught power and compost. Local livestock raising is increasingly being replaced by improved cattle raising.

11. **Cottage Industry**: Participation of households in the production of handicraft products is very limited in Ilam. The items produced at the household level are largely for domestic use and cater to local demands. New initiatives in terms of cottage industries are not visible.

12. **Off-Farm Employment**: All off-farm employment opportunities are lumped together to represent options adopted by farmers. Both casual and permanent employment opportunities, plus engagement in shops and trading, are included. In general,

engagement in casual employment dominates in the non-transformed area, while engagement in shops and trading and in permanent employment opportunities is common in the transformed area.

Adoption of Options

There is a variation in the number of production options and enterprises that farm households have adopted in both the TA and NTA. A broad grouping is made in terms of the number of enterprises adopted by households and is reported in Table 4.1. In both areas, households in general are found to have adopted a large number of production options. The farm households are apparently considered to be very diversified in terms of adoption of economic activities. Table 4.1 reveals that more than four-fifths of the total sample households have adopted more than six different types of activity. One-third of the households in the TA and half of the households in the NTA have adopted more than eight different types of household production option.

Table 4.1: **Number of Households by Broad Grouping of Enterprises**

Range of enterprises (options)	TA	NTA
up to 5	14	16
6 to 7	22	13
8 and more	24	31
Total households	60	60

Source: Field Survey 1995

However, a question such as: is it the case that the higher the number of options adopted by households, the greater the diversification? Is yet to be answered. If it is true that production systems in the NTA are more sustainable than in the TA, it is noted that the quality of life, social welfare, and equity aspects (including the state of the natural resource base) have improved and are much better in the TA than in the NTA. This, therefore, implies that the operational yardstick for measuring the level of diversification could apparently be different from the one discussed above.

Quality of Life

Derived from the 'Basic Need' concept, four components are included in calculating the quality of life index, viz, level of cereal consumption, amount spent on clothing, housing space, and literacy level. Differential weightages are assigned to each of the components to arrive at a composite index (Table 4.2). Food security, shelter, clothing, and education are important elements of basic needs. Their level of importance might be debatable – that food security is the most important aspect of basic needs and others could follow it according to merit. Since sustainability *per se* is a dynamic concept, the differential weightage is influenced by spatial as well as temporal dimensions.

Table 4.2: Weightages for Different Components of Quality of Life

Item	Weightages
Food	0.30
Clothing	0.20
Housing	0.20
Education	0.30
Total	1.00

Therefore, these weightages are not universal. Keeping in mind the context of Ilam, the differential weightages to different elements of the quality of life are assigned as shown in Table 4.2. The method adopted to calculate the index for the individual components and the primary index for the quality of life index is detailed below.

1. **Food**: Household-level annual cereal consumption is used to derive the per capita annual food consumption. The National Planning Commission (NPC) has provided an estimate of different levels of per capita food grain requirements for different ecological zones, viz., the Mountains, the Hills, and the *Terai*. Ilam is a hill district, and for it per capita requirements of 232kg of food grains are assumed. Households are assigned an index value on the basis of the level of basic needs being met. A weightage of 0.15 is assigned to food before including it in the quality of life index.

2. **Clothing**: Again following the NPC's recommendations, the per capita requirement for clothing is considered to be 11 metres of cloth and one pair of shoes, which may cost about Rs 650 (Rs 550 for clothes and Rs 100 for shoes). Households are scaled in terms of the extent the basic need is being met. The data are derived from the information on household expenditure. A weightage of 0.20 is assigned to clothing before including it in the primary index for the quality of life.

3. **Housing**: A basic need of one room for two persons is assumed for calculating the status of housing facilities available at the household level. A weightage of 0.20 is assigned.

4. **Education**: A one hundred per cent household literacy rate is assigned a value of one, and other levels of literacy are scaled between 0 to 1 in calculating an index for education. A weightage of 0.30 is assigned for education before calculating the quality of life index.

Summary measures of the components of the quality of life are presented in Table 4.3. The * signed t-values under individual variables indicate the significant difference in the mean values of the variables between the TA and NTA. Except in the case of food, there seems to be no significant difference in the mean values of the variables between the TA and NTA. When the primary indices for the quality of life are compared, the t-test confirms that the quality of life is significantly higher in the TA.

Table 4.3: Summary Measures of Components of the Quality of Life: Fo Clothing, Housing, and Education

Item	TA	NTA
Food (Weight = 0.30)		
Maximum	0.35	0.35
Minimum	0.12	0.01
Mean value	0.276	0.181
Standard deviation	0.077	0.102
	t = 6.06*	
Clothing (Weight = 0.20)		
Maximum	0.28	0.20
Minimum	0.07	0.06
Mean value	0.192	0.187
Standard deviation	0.028	0.028
	t = 0.91	
Housing (Weight = 0.20)		
Maximum	0.30	0.30
Minimum	0.09	0.08
Mean value	0.262	0.249
Standard deviation	0.065	0.071
	t = 0.78	
Education (Weight = 0.30)		
Maximum	0.15	0.23
Minimum	0.07	0.00
Mean value	0.126	0.117
Standard deviation	0.027	0.038
	t = 1.72	
Quality of life(Weighted)		
Maximum	1.00	1.00
Minimum	0.43	0.27
Mean value	0.86	0.73
Standard deviation	0.12	0.16
	t = 5.02*	

*Note: * Significant at a 99 per cent level*

Depending on the index value of the quality of life, households can be classified into different levels. Index values ranging from 0 to 0.5 are assumed to indicate a low level quality of life, values between 0.51 to 0.75 refer to a medium level, and values of 0.75 or more show higher levels of quality of life.

Based on the above arrangement for grouping, Table 4.4 shows that four-fifths of the total sample households in the TA are enjoying a higher level of quality of life compared to only less than two-fifths of the households in NTA.

Welfare

Three components are considered in constructing the welfare index, viz., (a) the female-male ratio in household-level education expenses, (b) the female-male ratio in household-

Table 4.4: Number of Households with Low, Medium and High Quality of Life

Level of Quality of Life	Index Value	TA	NTA
Low	Less than 0.50	1	4
Medium	0.50 to 0.75	10	23
High	Above 0.75	49	23

level health expenses, and (c) the female-male ratio in per capita clothing expenses. The less gender disparity in these expenses, the higher the level of welfare attained in the household.

As discussed in the conceptual framework (Chapter 2), other important variables associated with community-level welfare could not be considered due to lack of data. Hence, the gender concern mainly is examined in this report.

The summary measurements of individual components of the welfare index and the primary index for welfare are presented in Table 4.5.

Table 4.5: Summary Measurements of Components of Welfare: Gender Differentiation in Education, Health, and Clothing

Item	TA	NTA
Education		
Maximum	1.00	1.00
Minimum	0.13	0.33
Mean value	0.747	0.813
Standard deviation	0.228	0.236
	$t = 1.38$	
Health		
Maximum	1.00	1.00
Minimum	0.29	0.17
Mean value	0.895	0.877
Standard deviation	0.162	0.218
	$t = 0.51$	
Clothing		
Maximum	1.00	1.00
Minimum	0.27	0.10
Mean value	0.842	0.840
Standard deviation	0.227	0.205
	$t = 0.01$	
Welfare index (adjusted)		
Maximum	1.00	1.00
Minimum	0.52	0.49
Mean value	0.828*	0.843
Standard deviation	0.127	0.121
	$t = 0.66$	

*Note: * Significant at a 99 per cent level*

A mean difference test is performed to examine whether the individual indicators are statistically different between the TA and NTA. Computed t-values are not significant in the case of both the individual indicators and the primary index for welfare. TA and NTA households are similar in terms of the welfare situation.

Most households, 73 per cent in the TA and 82 per cent in the NTA, enjoy a higher level of welfare, indicating a low degree of gender discrimination (Table 4.6).

Table 4.6: **Number of Households with Low, Medium, and High Welfare Levels**

Level of welfare	Index value	TA	NTA
Low	Less than 0.50	0	1
Medium	0.50 to 0.75	16	10
High	Above 0.75	44	49

Resource Base Condition

Estimation of the index to represent the condition of the natural resource base (forests, pastures, etc) at the household level appeared to be cumbersome. It was difficult to calculate the areas of forest, pasture, and other public land being used by each individual household because of a lack of micro-level data on these resources. Further, it was difficult to obtain information on the extent of use of these resources by each household. Hence, only private land was considered in assessing the status of the resource base at household level.

The natural resource base condition at household level is defined as the mean value of: (i) the ratio of non-tillage to tillage farm land and (ii) the ratio of grassland/marginal land (*kharbari*) to cultivated land. The greater the above ratio is, the greater the allocation of land to crops of a perennial nature. The assumption here is that frequent tillage of slopy hill land is ecologically inimical. Both the lands under perennial crops and grassland/marginal land are not tilled. The soil of such land is less prone to erosion and degradation.

The summary measurements of the index for the resource base condition is presented in Table 4.7. The mean values of the index for the resource condition in the TA and NTA were tested for the statistical difference in the magnitude using the mean difference test. The t-value is significant at a level of 99 per cent. Hence, the mean value of the index for TA households is greater than that for NTA households (see Table 4.7).

In assessing houeholds according to their securing low, medium, or high indices in relation to the resource situation, half of the TA households secured an index value of 0.50 and above. In the NTA, only 35 per cent of the households secured such a high index value. Tillage farming is relatively common in the NTA. Farmers in the TA are

increasingly switching from cereal crops to crops, such as tea, cardamoms, and broom grass, that are perennial in nature.

Table 4.7: **Summary Measurements of Resource Condition**

Index of resource condition	TA	NTA
Maximum	1.00	1.00
Minimum	0.13	0.18
Mean value	0.57	0.47
Standard deviation	0.24	0.19
	t = 2.56*	

*Note: * Significant at a 99 per cent level*