5

Ecological, Economic, and Social Dimensions of Sustainability — Some Indicators

The diverse livelihood options adopted by the households, as discussed in Chapter 4, have implications for different dimensions of sustainability, namely, natural resource base, equity, and quality of life. Some indicators related to these three dimensions of sustainability are discussed in the present chapter.

Crop cultivation, a dominant production option practically in all mountainous regions, characterised by inaccessibility, marginality, and fragility, has adverse ecological implications. As is well documented by now, the cultivation of annuals on marginal and steep sloping lands causes soil erosion, landslides, and environmental degradation. Therefore, from the sustainability perspective, among the different livelihood options, the cultivation of fruit crops is more sustainable than other options. Furthermore, recent developments, most notably the introduction and ever-increasing replacement of wooden boxes with cardboard boxes for packing apples, recycling of packing boxes, and import of timber from neighbouring states, have lessened the dependence of these crops on natural resources, mainly forests, thereby enhancing the sustainability prospects.

Livestock are yet another dominant production option in mountainous regions, and the study areas were no exception. In this regard, recent developments again, particularly in the transformed areas, for instance the sharp decline in the number of animals, improvement in their quality as a result of the complete replacement of local animals with improved animals, switching over to stall feeding, and a better market for dairy products, have made the livestock production option economically viable and also compatible with the natural resource base of the local area and have enhanced its sustainability. In comparison, in the non-transformed areas, a high livestock population, poor quality of livestock, and grazing practices result not only in low production but also in degradation of pastures and grazing lands.

The remaining livelihood options, in particular businesses and shops and agricultural and non-agricultural labour, have better prospects for sustainability because they are tertiary in nature and much less dependent on the natural resource base. It, however, needs to be underlined that these options are direct manifestations of the forward and backward linkages generated by the dominant production option of high-value cash crops. Their sustainability, therefore, hinges on the sustainability of high-value cash crops.

Ecological Indicators

Different indicators reflecting ecological health and the status of the natural resource base in the transformed and non-transformed areas are given in Tables 38 and 39 respectively.

Table 38: Ecological Dimensions of Sustainability: Micro-Level Indicators from the Transformed Areas

S. No.	Indicators	Process of Change and Implications
1.	Decline in the livestock population	The decline in the livestock population per household along with the complete switch over to stall feeding have reduced the pressures on natural resources. The quality of livestock has also improved leading to higher yields. These changes augur well for the ecology and environment of the area.
2.	Abandoned land	There is no abandoned land; in fact every inch of land is used. Marginal and steep sloping lands have been brought under apple cultivation.
3.	Land under irrigation	Almost all the land is under irrigation. The irrigation scheme is functioning well and is managed by the Department of Irrigation and Public Health.
4.	Water from natural sources	There is no perceptible change in the amount of water available from natural water sources. In fact, the pressure on these sources has lessened because of the provision of piped water to all villages.
5.	Frequency of landslides and soil erosion	There is no visible change in the frequency and intensity of landslides. Apple cultivation has helped to check landslides and soil erosion. The cropping intensity has declined. The orchards have thick grass cover which protects the soil.
6.	Support land	The amount of support land in terms of pastures and grasslands available per hectare of agricultural land has declined to 0.11 hectares.
7.	Decline in people's participation in the management of community resources	The concern for maintaining natural and community resources has declined. People now do not take interest in the maintenance of forests, water resources, etc, and a feeling of insouciance is pervasive.
8.	Increase in the time devoted to fuelwood and fodder collection	Though the time required to fetch fuelwood and fodder has doubled; peoples' dependence on forests has declined because of replacement of fuelwood, partly with liquid petroleum gas (LPG) and partly with the pruned branches from orchards. People have also started planting Poplar and Alder trees for fuelwood. Further, because of the decline in the number of animals per household and improvement in their quality, fodder requirements have declined. Most of the requirements are met from the grass grown in the orchards.
9.	Use of chemical fertilizers and farmyard manure	The people of the area use fertilizers and are aware of the harmful effects of the excessive use of chemical fertilizers. To minimise these adverse effects they have started using more FYM and compost along with balanced use of chemical fertilizers.
10.	Demand for timber for house construction	In earlier times, the houses were made of wood and stone. Nowadays, they are made of bricks, cement, iron, and steel. This has reduced the demand for timber considerably.
11.	Crop yields	The crop yields are very high and have increased over time, primarily because of the increase in use of modern inputs.
12.	Cropping patterns	The cropping patterns of the area conform to the mountain specificities, i.e., marginality, fragility, and niche. This has led to a fall in the cropping intensity causing less soil erosion. In these areas, economic self-interest and ecology appear to be in complete harmony, i.e., farmers shifting from annual crops to tree-based farming systems.

Table 38 Cont.....

S. No.	Indicators	Process of Change and Implications
13.	Biodiversity	The excessive use of chemicals and sprays of insecticides and pesticides has taken a heavy toll of the rich biodiversity of the area. Honeybees have been killed. Predators and useful insects have been destroyed. This has started affecting apple production. To sum up, harnessing of the local niche (comparative advantages) has affected biodiversity in two ways: First, reduction in the number of crops grown, second, destruction of predators and useful insects.
14.	Investment in agriculture	Investment in making permanent improvements on land such as bunding, terracing, and so on constitutes about 30 to 40 per cent of the total income. The farmers are aware of the importance of maintaining/ improving the productivity of the land and hence the need for adequate investment.
15.	Demand for wooden boxes for packing fruits	As noted above, in the 1960s and 1970s local forest resources were used for packing cases. This has an adverse effect on the forests of the area. Now, the practice of allotting timber from local forests for manufacturing boxes has been stopped by a complete ban on felling trees. As an alternative to this, cardboard boxes are being supplied to the farmers. As a result, out of the total boxes used, nearly 20 per cent are cardboard boxes, 20 to 30 per cent are recycled and supplied by middlemen from Delhi, and the remaining 50 per cent demand is met by importing Eucalyptus timber from the main adjoining areas of Haryana and Punjab. In brief, apple cultivation might have depleted forest reserves in the beginning, but, over time, cardboard boxes and other alternatives have reduced the dependence on forests for horticultural purposes.

Source: Field Survey, 1995

Equity

Both intra- and inter-generational equity is one of the most important prerequisites to sustainable development. The process of economic transformation, accompanied by widening inequalities, is inherently unstable. For example, agricultural development that dispossesses large numbers of marginal and small farmers and makes income distribution more inequitable cannot be sustained in the long run. In fact, some scholars have argued that the ideal solution to ensuring sustainable development lies in facilitating the equitability of the system, even at the cost of sacrificing some productivity (Conway 1990, pp 36-37; Redclift 1987, pp 19-20). In this context, different equity indicators, relating to both the transformed and non-transformed areas, are given in Tables 40 to 42. It shows that the process of economic transformation has not exacerbated intra-household inequalities. On the contrary, there are fewer inequalities in the transformed areas than in the non-transformed areas. For example, in the former areas, income distribution, measured by the Gini ratio, is less skewed, male-female wage differentials are less pronounced, and female literacy is significantly higher. Contrary to the prevailing opinion that the commercialisation of agriculture, consequent to the introduction of high-value cash crops, tends to marginalise women, the evidence shows that the transformation process has improved employment opportunities for them. Women now, particularly those belonging to lower castes and those

Table 39: Ecological Dimensions of Sustainability: Micro-Level Indicators from Non-transformed Areas

S. No.	Indicators	Process of Change and Implications
1.	Decline in the livestock population	The livestock population has declined over time. Milk production has also declined for two reasons. First, decline in the grazing land and the availability of fodder, second, the low quality of livestock.
2.	Abandoned land	There is no abandoned land
3.	Land under irrigation	There is no irrigation. However, more recently, because of the implementation of a micro-watershed project in the area, efforts have been made to store rain water and use it for irrigation during the dry season.
4.	Water from natural sources	There has been no perceptible change in the amount of water available from natural sources.
5.	Landslides and soil erosion	There has been no noticeable increase in the intensity and frequency of landslides and soil erosion thanks to the measures adopted by the farmers, e.g., terracing, bunding, and avoiding cultivation on steep slopes.
6.	Support land	The amount of support land in terms of pastures and grasslands has declined over time. One hectare of agricultural land has 0.45 hectares of support land, which is much less than desired. It is, however, much higher than in the transformed areas.
7.	People's participation in the management of community resources	People's participation in the management of common resources, e.g., forests and water, has declined.
8.	Time devoted to fuelwood and fodder collection	Time devoted to the collection of fuelwood and fodder has increased from about 2-3 hours two decades ago to about 4-6 hours now.
9.	Use of chemical fertilizers and farmyard manure	The farmers of the area, though they are poor and have low yields, prefer FYM to chemical fertilizers. The majority of farmers are fully aware of the harmful effects of chemical fertilizers on soils. Recently, because of the decline in the number of animals, they have started making compost to compensate for the loss of FYM.
10.	Demand for timber for house construction	There is a huge demand for timber for house construction. To construct a moderate house requires 8 to 10 full-grown deodar trees. With some improvements in the economic status of the households, demand for timber has increased considerably. Since there is no link road to transport cement, iron and steel and bricks, dependence on the forest has increased leading to overexploitation.
11.	Investment in agriculture	The investment in agriculture is about 10 to 15 per cent. Happily farmers are aware of the need for maintaining the productive capacity of the land and invest in terracing, bunding, etc.
12.	Grazing of animals	Grazing of animals is a common practice; on an average, animals are left to graze 5 to 6 hours every day.
13.	Cropping pattern	There is a significant proportion of cultivated land under annual crops, and this has adverse implications on the ecology and environment of the area. The plantation of fruit crops, such as apples, particularly on marginal land, has helped check soil erosion. Again, nearly one-fifth of the total land is under pastures and grasslands and this helps to check soil erosion.

Table 39 Cont.....

S. No.	Indicators	Process of Change and Implications
14.	Fuelwood consumption	There is a very high dependence on forests for fuelwood. The average household fuelwood consumption is about 4-5 quintals per month, and 90% of the total requirement is met from the forests. This huge demand cannot be sustained and has adverse ecological implications.
15.	Crop yields	The crop yields are very low compared to the transformed areas. This is partly due to the low use of chemical fertilizers and, while it bodes well for sustainability, the high incidence of poverty requires the increased use of fertilizers and other modern inputs to raise the living standards of the population, as emphasised by the World Commission on Environment and Development.
16.	Biodiversity	The biodiversity in the area, though less affected than in the transformed areas, has shrunk over time. The cultivation of traditional millet crops is fast declining. The encroachment on common property land and excessive dependence on forests are also affecting biodiversity adversely.

Source: Field Surve, 1995

from landless households, are economically more independent than ever before and enjoy a higher standard of living than their counterparts in non-transformed areas. These developments have far-reaching implications on the rearing of children, adoption of family planning, education of children, and so on, and these are well documented in the literature. Another redeeming feature, which augurs well for sustainable development, is that women in the transformed areas take part in a large number of activities, such as managing shops and businesses, marketing goods, and so on, which used to be in the male domain until a few years back.

In brief, micro-level evidence from the transformed areas disproves the generally accepted belief that, when small farmers commercialise, they increasingly dispossess land, suffer unemployment, succumb to malnutrition, and have reduced access to food. The data also lend credence to the hypotheses set out in Chapter One, that, in the process of economic transformation consistent with mountain specificities, some endogenous factors operating expressly on the demand side, most notably improvement in human capital; change in the composition, quality, and pattern of rearing livestock; substitution of fuelwood with kerosene and LPG; and substitution of natural products with synthetic products, e.g., wooden boxes by cardboard boxes, are created which ease the pressure on natural resources and thereby promote sustainable development.

The Quality of Life

This is yet another important factor that directly impinges upon the sustainability of any system. The expenditure on superior grains, education, health, shelter, clothing, *inter alia*, reflects the quality of life of the people. The evidence in this regard shows that people in the transformed areas (Table 43) enjoy a much better quality of life than their counterparts in the non-transformed areas. As shown in tabulated form, per household expenditure on superior grains, which include

Table 40: Social Dimensions of Sustainability: Micro-Level Indicators from the Transformed Areas

S. No.	Indicators	Process of Change and Implications
1.	Food habits	There is a drastic change in the food habits of the people. About two decades ago millet, barley, and corn used to be the main foodgrains, whereas wheat and rice are the main foodgrains today. In addition, meat, eggs, fruit, and vegetables are also important dietary components.
2.	Health status	The general health status of the people has improved significantly. The incidence of disease has gone down. Since the income of the people has increased, they can now afford better health facilities.
3.	Water and land-related disputes	There is no evidence of a significant increase in water and land-related disputes.
4.	Social values	Economic prosperity ushered in by the introduction of cash crops has, however, dealt a severe blow to the social cohesiveness and values. The people have become more individualistic in outlook. The society is becoming inflicted by many evils, e.g., a very high incidence of alcohol consumption. Social institutions such as community participation in the management of natural resources, labour exchange system, and so on are fast disappearing.
5.	Female literacy and social status	Literacy and general awareness among females have increased. They actively participate in household decisions. This is evident from the fact that polygamy, which was common twenty years back, has completely disappeared. The appreciation and increasing acceptance of small family norms is yet more evidence of the improved status of women.
6.	Changes in the attitude of the people	There is a remarkable change in the attitude of the people. For example, untouchability is on the wane; people have become much more receptive to innovations and new ideas. The people of the area often visit the regional research stations of the Indian Agricultural Research Institute, Himachal Pradesh Agricultural University, and the University of Horticulture and Forestry located in the area to educate themselves about innovations.
7.	Female-headed households	The number of female-headed households has declined over time. The incidence of male outmigration is much less. Due to the spread of apple cultivation, many male members who were in the services and posted outside have left their jobs to look after their family farmlands which are now converted into fruit orchards.
8.	Joint family system	The joint family system has disappeared. Practically all the families are nuclear.

Source: Field Survey, 1995

wheat and rice, and expenditure on education and clothing are substantially higher in the transformed area. Likewise, the availability and use of facilities such as telephones, LPG, and television and better built, better quality residential housing in these areas speak volumes about the quality of life being enjoyed. On the other hand, in the non-transformed areas, people, particularly small and marginal households, are barely surviving. Expenditure on superior grains, education, and clothing is extremely low and some families remain perpetually in debt. The detailed consumption patterns of the households in both areas have been provided in Table 44.

Table 41: Social Dimensions of Sustainability: Micro-Level Indicators from the Non-transformed Areas

S. No	Indicators	Process of Change and Implications
1.	Food habits	Food habits have changed from traditional millet to corn and wheat. Expenditure on pulses, fruit, and vegetables, though very low, has increased over time.
2.	Health status	There is not much improvement in the health status of the people.
3.	Social values	Though social values have tended to change, the extent of social disintegration is much less than in the transformed areas. Social institutions, such as labour sharing, are still functioning effectively. Likewise, the incidence of social crimes is also less.
4.	Female literacy	Female literacy is very low. The practice of polygamy, though declining, is still there. Nearly 40 per cent of the households involve females in household decision-making. The society continues to be male dominated.
5.	Attitudes of the people	The people of the area are very conservative and averse to risk. They do not like to move out for jobs or land labour work to the towns and cities. The practice of untouchability is strictly followed.
6.	Female-headed households	There is no noticeable increase in the number of female-headed households. Despite the lack of employment opportunities, males do not like to migrate. Thus there are not many female-headed households.
7.	The joint family system	The joint family system has not disappeared completely; nearly 40 per cent of the households have joint families.

Source: Field Survey, 1995

Sustainability Perceptions

From the policy perspective, it is essential to understand households' perceptions of basic needs, the time horizon regarding the needs of future generations and the types of assistance they require to promote sustainable development. In fact, guided by past experience, failure to promote sustainable development could primarily be attributed to the hiatus and mismatch between the objective functions of households at the grassroots' level and those of policy-makers. Therefore, to gain insight into the farmers' perceptions about various aspects impinging on the sustainability of a production system, their views were elicited. The details are given in Table 45. The following comments are in order.

First, there is a significant difference between the transformed and non-transformed areas in households' perceptions regarding the satisfaction of present and future needs. For example, half of the small and medium households in the latter areas are concerned with meeting their present needs. This supports the belief that, in poor and backward regions, the satisfaction of immediate needs is the primary concern of households. In any case, it is important to underline that the households' concerns do not extend beyond satisfaction of the needs of two generations.

Second, whereas, in the transformed areas, ensuring food security and provision of education are deemed to be the two most important needs for future genera-

Table 42: Implications for Equity

S. No.	Particulars	Status	
		Transformed Areas	Non-transformed Areas
1.	Male wages (Agricultural)	IRs 30.00	IRs 25.00
2.	Female wages	IRs 25.00	IRs 20.00
3.	Income distribution (Gini Ratio)	0.37	0.40
4.	Female literacy	42.62	34.18
5.	Male literacy	60.09	53.48
6.	Percentage of female participation in household decisions	90.00	40.00
7.	Sexual division of labour	Less activities exclusively performed by males; females are often seen managing the shop, etc	Rigid and less flexible sexual division of labour.
8.	Female employment	The introduction of new cash crops has opened up opportunities for female employment. For example, many women earn handsome amounts by working in apple orchards.	Such changes are discernible in the non-transformed areas as well but the impact is much less pronounced
9.	Percentage of females having secondary and higher level education	41.34	12.96
10.	Percentage of school-going children		
	Males	100.00	100.00
	Females	100.00	100.00

Source: Field Survey, 1995

tions, in the non-transformed areas, the satisfaction of all basic needs is considered of utmost importance.

Third, it is interesting to note that a significant proportion of households in the transformed areas does not want subsidies from the government. They feel that, in the garb of subsidies, sub-standard materials are supplied to them and most of the subsidies are pocketed by a few rich orchardists. What is more important to them is the provision of technical knowhow and basic infrastructural facilities. In contrast, the households in non-transformed areas expect the government to supply all basic facilities, including subsidies.

Fourth, in both types of area, households want equal participation in the management of local natural resources, e.g., forests, water, and common property lands, and also in development activities. They attribute the failure of government-sponsored schemes to insensitivity to and alienation from local needs and potentials.

Table: 43: Impact on the Quality of Life

S. No	Particulars	Transformed Areas (Farmers)				Non-transformed Areas (Farmers)			
		Small	Medium	Large	All HHs	Small	Medium	Large	All HHs
1.	Expenditure on superior grains	4838 (10.00)	5064 (8.70)	7111 (10.84)	5124 (10.49)	3292 (15.34)	3617 (11.39)	4071 (10.91)	3461 (13.40)
2.	Access to food (%age of HH)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
3.	Expenditure on clothing	4445 (9.93)	5563 (9.56)	6000 (9.14)	4765 (9.75)	2418 (11.26)	3738 (11.77)	5000 (13.40)	3040 (11.76)
4.	Expenditure on milk & milk products	10286 (22.97)	13870 (23.82)	19345 (29.48)	11771 (24.09)	1540 (7.17)	4677 (14.73)	5475 (14.67)	2774 (8.80)
5.	Expenditure on meat, fish and eggs	1942 (4.34)	4125 (7.09)	3000 (4.57)	2344 (4.81)	667 (2.93)	1463 (4.60)	1114 (2.98)	893 (3.46)
6.	Expenditure on fruit and vegetables	2169 (4.84)	3263 (5.60)	2769 (4.22)	2378 (4.87)	539 (2.51)	1005 (3.16)	891 (2.39)	697 (2.70)
7.	Expenditure on education	4947 (11.05)	6038 (10.37)	5714 (8.70)	5174 (10.59)	1668 (7.77)	1944 (6.12)	2457 (6.58)	1826 (7.07)
8.	Expenditure on health	1146 (2.56)	1150 (1.98)	1429 (2.18)	1174 (2.40)	1497 (6.98)	1772 (5.58)	1743 (4.67)	1594 (6.17)
9.	Value of residential houses (per HH, IRs)	100170	112500	207143	113839	41150	72500	110000	56762
10.	Percentage of HHs using LPG	37.78	50.00	57.14	43.33	-	-	-	-
11.	Percentage of HHs having telephone connections	17.78	37.50	28.57	21.67	-	-	-	-
12.	Percentage of HHs having television	100.00	100.00	100.00	100.00	12.50	25.00	42.86	20.00
13.	Literacy level (per cent)	51.62	48.28	59.29	52.19	35.38	32.73	20.95	44.64
14.	Percentage of HHs in debt	6.67	-		5.00	37.50	37.50	-	35.00
15.	Percentage of HHs without electricity	-	-		-	17.50	-	-	11.67
16.	Percentage of HHs below poverty line	-	-		-	40.00	14.28	-	30.00

Source: Field Survey, 995

Table 44: Consumption Patterns of Sample Households

Particulars	Transformed Areas				Non-transformed Areas			
	Small	Medium	Large	All HHs	Small	Medium	Large	All HHs
A. Food Items								
1. Cereals								
(i) Wheat	1975 (4.41)	2184 (3.75)	2585 (3.94)	2071 (4.24)	2522 (11.75)	2430 (7.65)	2914 (7.81)	2542 (9.84)
(ii) Maize	910 (2.03)	1073 (1.84)	864 (1.32)	926 (1.90)	2312 (10.77)	2389 (7.52)	3454 (9.26)	2458 (9.51)
(iii) Rice	2863 (6.39)	2880 (4.95)	4526 (6.90)	3053 (6.25)	770 (3.58)	1187 (3.74)	1157 (3.10)	919 (3.55)
2. Pulses	2747 (6.14)	3630 (6.24)	3771 (5.75)	2977 (6.09)	1166 (5.43)	1661 (5.23)	2529 (6.78)	1440 (5.57)
3. Dil & Ghee	1780 (3.98)	2310 (3.97)	2914 (4.44)	1976 (4.04)	1836 (8.55)	2996 (9.43)	3127 (8.38)	2274 (8.80)
4. Milk	10286 (22.97)	1387050 (23.82)	19345 (29.48)	11771 (24.09)	1540 (7.17)	4677 (14.73)	5475 (14.67)	2774 (10.73)
5. Meat, Fish, Eggs	1942 (4.34)	4125 (7.09)	3000 (4.57)	2344 (4.80)	627 (2.92)	1463 (4.61)	1114 (2.99)	893 (3.46)
6. Sugar	1897 (4.24)	1808 (3.10)	3797 (5.79)	2100 (4.30)	1019 (4.75)	1635 (5.15)	1569 (4.20)	1236 (4.78)
7. Beverages	489 (1.09)	533 (0.92)	857 (1.31)	537 (1.10)	312 (1.45)	566 (1.78)	677 (1.81)	417 (1.61)
8. Fruit and Vegetables	169 (4.84)	3263 (5.60)	2769 (4.22)	2378 (4.87)	539 (2.51)	1005 (3.16)	891 (2.39)	697 (2.70)
9. Total Expenditure	27058 (60.43)	35676 (61.28)	44428 (67.71)	30133 (61.68)	12643 (58.89)	20009 (63.01)	22908 (61.40)	15650 (60.56)
B. Non-food Items								
1. Clothing	4445 (9.93)	5563 (9.56)	6000 (9.14)	4765 (9.75)	2418 (11.26)	3738 (11.77)	5000 (13.40)	3040 (11.76)
2. Education	4947 (11.05)	6038 (10.37)	5714 (8.70)	5174 (10.59)	168 (7.77)	1944 (6.12)	2457 (6.58)	1826 (7.07)
3. Health	1146 (2.56)	1150 (1.98)	1429 (2.18)	1174 (2.40)	1497 (6.98)	1772 (5.58)	1743 (4.67)	1594 (6.17)
4. Transport	1405 (3.14)	1431 (2.46)	1286 (1.96)	1395 (2.86)	464 (2.16)	769 (2.42)	1029 (2.76)	604 (2.34)
5. Social ceremonies	2210 (4.94)	3063 (5.26)	1686 (2.57)	2260 (4.63)	1076 (5.01)	1076 (5.01)	1759 (4.71)	1243 (4.81)
6. Fuel and electricity	1460 (3.26)	2200 (3.78)	1764 (2.69)	1590 (3.25)	276 (1.29)	276 (1.29)	524 (1.40)	332 (1.28)
7. Oil, Soap etc.	743 (1.66)	1208 (2.07)	837 (1.28)	814 (1.67)	302 (1.41)	302 (1.41)	471 (1.26)	348 (1.35)
8. Miscellaneous	1357 (3.03)	1888 (3.24)	2471 (3.77)	1551 (3.17)	1128 (5.25)	1128 (5.25)	1428 (3.83)	1204 (4.66)
Total Expenditure on Non-food Items	17714 (39.57)	22542 (38.72)	21187 (32.29)	18724 (38.32)	8829 (41.11)	8829 (41.11)	14411 (38.60)	10191 (39.44)
Grand Total	44772 (100.00)	58218 (100.00)	65615 (100.00)	48856 (100.00)	21472 (100.00)	21472 (100.00)	37318 (100.00)	25841 (100.00)

Source: Field Survey, 1995

Note: Figures in parentheses are percentages.

Table: 45: Sustainability Perceptions of Sample Households (Per Cent Households)

S. No	Particulars	Transformed Areas				Non-transformed Areas			
		Small	Medium	Large	All HHs	Small	Medium	Large	All HHs
1.	Time perspective Should be able to satisfy-								
	i) present needs	-	-	-	-	50.00	43.75	-	42.86
	ii) future needs								
	a) two generations	100.00	100.00	100.00	100.00	50.00	56.25	100.00	57.14
	b) more than two generations	-	-	-	-	-	-	-	-
2.	Most important for future generations-								
	i) food security	85.11	75.00	71.43	82.23	100.00	100.00	100.00	100.00
	ii) education	80.85	100.00	100.00	85.48	75.00	100.00	100.00	84.13
	iii) health	42.55	50.00	57.14	45.16	100.00	100.00	100.00	100.00
	iv) shelter	46.81	37.50	42.85	45.16	100.00	100.00	100.00	100.00
3.	Support from government to promote sustainability-								
	i) subsidies	49.34	25.00	28.57	45.16	100.00	75.00	57.14	88.89
	ii) technical knowhow	85.11	100.00	100.00	88.71	100.00	100.00	100.00	100.00
	iii) infrastructural facilities	85.11	100.00	100.00	88.71	100.00	100.00	100.00	100.00
4.	Pattern of resource management-	-	-	-	-	-	-	-	-
	i) government	-	-	-	-	-	-	-	-
	ii) people	-	-	-	-	-	-	-	-
	iii) participation of both	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
5.	Indicators of sustainability-								
	i) maintaining land productivity	51.06	100.00	100.00	62.90	75.00	100.00	100.00	84.13
		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	ii) stability in crop yield	17.02	-	-	12.90	-	-	-	-
	iii) equal distribution	8.51	50.00	71.43	20.97	-	-	-	-
	iv) maintenance of biodiversity								
6.	Factors contributing to the adoption of superior production options-								
	i) political patronage	100.00	100.00	100.00	100.00	-	-	-	-
	ii) infrastructural facilities	85.11	100.00	100.00	88.71	-	-	-	-
	iii) availability of subsidies	95.74	100.00	100.00	96.77	-	-	-	-
	iv) extension facilities	95.74	100.00	100.00	96.77	50.00	100.00	100.00	52.38
7.	New options cannot be sustained because of-								
	i) lack of availability of packing cases	42.55	-	-	-	-	-	-	-
	ii) fluctuating yields	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	iii) increasing incidence of diseases	74.46	50.00	28.57	66.13	75.00	56.25	50.00	66.67
				-	32.26	-	-		-
	iv) market fluctuations	42.55	-						

Source: Field Survey, 1995

Fifth, the households view sustainability of any production system in terms of increase in its productivity coupled with its stability. Other important aspects of sustainability, such as biodiversity and equity, are not of much concern to them.

Sixth, in the transformed areas, households perceive factors such as availability of basic infrastructural facilities, subsidies, and extension facilities to have played an important role in popularising high-value cash crops, for instance, apples. On the other hand, availability of extension facilities has been singled out to be the most important factor in the non-transformed areas.

Seventh, in farmers' perceptions, spread of diseases and consequently wide fluctuations in the production of fruit crops are formidable constraints and endanger the sustainability of these crops.

To sum up, there is no significant difference in the perceptions of the households about the diverse aspects impinging on sustainability. The data, however, lend some support to the hypothesis that resource poor households are primarily concerned with meeting their immediate needs.