

# Chapter 5

## Emerging Impacts

### Introduction

This chapter looks in more detail at how the project has contributed towards achieving its desired results and what impacts have already emerged at the grassroots level, or are likely to be generated as a result of the project. An impact assessment survey was carried out focusing on three issues:

- a) assessment of the impacts of water- and energy-related technologies on energy (fuelwood) use, and time saving;
- b) perceived project impacts on skill enhancement, time and drudgery reduction, and widening women's livelihood options through skill-based, income-generating activities; and
- c) assessing the strength of local organisational capacity building of women and social capital formation as a vehicle for women's empowerment at the community level.

### Impact Assessment Survey

The impact assessment survey of women beneficiaries was carried out at each project site using a set of pre-structured questionnaires developed by ICIMOD. In the absence of a scientifically-designed baseline survey, the impact survey used a historical recall memory method ('before and after' situation) to capture the emerging impacts using both quantitative and qualitative indicators. The sample survey covered all the women members of the project sites in Bhutan, and 57 and 40 women beneficiaries selected at random from the project sites in India and Nepal respectively (Table 5.1).

### General socioeconomic profile

The detailed socioeconomic profile of the women sampled is shown in Table 5.2. Some 43% of the women surveyed in India were literate compared to 75% in Nepal and 11% in Bhutan. About one-third of the women members surveyed in Palpa and 10% in Dhankuta were female heads of households, but only one woman in India. In Bhutan, most women were classified as heads of household reflecting the different social system.

The largest average family size was found in HP, about 9 members compared to less than 6 at the other project sites. The average size of livestock holdings, expressed in terms of livestock standard units (LSU)<sup>1</sup>, was highest in Bhutan (8.4) compared to about 3 in both India and Nepal; livestock holdings were also much higher in Palpa Nepal, than in Dhankuta. Agriculture was the mainstay of most women at all the project sites with the exception of HP where about 70% of women depended on non-agricultural occupations (trade and business, service, and wage labour) to sustain their livelihoods (Table 5.3).

<sup>1</sup> The conversion factors used to convert livestock to Livestock Standard Units (LSU) are: cattle = 0.7; buffalo = 1.0; sheep/goats = 0.2; pigs = 0.3; poultry = 0.025.

	Bhutan			India			Nepal		
	Phobjikha	Limukha	Total	U'chal <sup>1</sup>	HP	Total	Palpa	Dhankuta	Total
Total group members	11	7	18	64	40	84	179	112	291
Sample women (no)	11	7	18	20	20	40	29	28	57
Sample coverage (%)	100	100	100	31	50	47	16	25	20

<sup>1</sup> Uttaranchal

	Phobjikha	Limukha	Bhutan	U'chal <sup>1</sup>	HP	India	Palpa	Dhankuta	Nepal
Sample size	N=11	N=7	N=18	N=20	N=20	N=40	N=29	N=28	N=57
Age of respondent									
Mean	33.0	33.6	33.2	37.2	42.6	39.9	29.5	33.3	31.3
SD	12.0	16.6	13.5	14.3	11.3	13	9.1	12.6	11
Household size									
Mean	5.2	4.7	5.0	4.7	9.2	7	5.7	5	5.4
SD	2.9	2.2	2.6	2.6	2.6	3.4	2.5	1.8	2.2
Female-headed household %	82	100	89	0	5	2	35	11	23
Literacy rate of respondents %	9.1	14.3	11	45	40	43	69	82	75
Size of land holding									
Mean	3.4	3.6	3.4	6.4	2.4	4.4	1	1.8	1.4
SD	2.1	2.2	2.1	4.1	3.7	4.3	1.1	1.2	1.2
Proportion irrigated									
Mean	9.0	2.3	6.4	0.2	0	0.1	18.5	24.4	21.4
SD	19.8	1.5	15.6	0.9	0	0.6	29.1	18.8	24.5
Livestock unit s (LSU)									
Mean	9.0	7.2	8.4	2.6	3.3	2.9	5.3	0.9	3.1
SD	4.0	3.7	3.9	1.9	2.1	2	3.3	1	3.3

SD = standard deviation <sup>1</sup> Uttaranchal  
Source: Impact Survey 2004

Main Source of Income	Phobjikha	Limukha	Bhutan	U'chal <sup>1</sup>	HP	India	Palpa	Dhankuta	Nepal
Agriculture	90.9	100	94.4	80	30	55	62	96	79
Trade & business	0	0	0	10	20	15	0	0	0
Service	0	0	0	10	20	15	7	4	5
Wage labour	9.1	0	5.6	0	30	15	3	0	2
Occupational work	0	0	0	0	0	0	17	0	9
Other	0	0	0	0	0	0	10	0	5

Source: Impact Survey 2004 <sup>1</sup> Uttaranchal

Food deficit was a recurring phenomenon for most of the women, especially in the project areas in India where no woman produced enough food to last more than six months of the year (Table 5.4). In contrast, some 10% of women in Palpa and 39 % in Dhankuta reported having surplus food for sale. About two-thirds of the women in Uttaranchal, 45% in HP, and 43% in Limukha had an annual household income of less than IRs or Bhutanese Nu 15,000. In Phobjikha and Dhankuta almost all women had more than this, in Palpa less than 20% had an annual income of less than NRs 15,000, and around one-third had less than the equivalent of IRs 15,000 (NRs 24,000).

	Food Sufficiency Months							
	<- 3 months		4-6 months		7-12 months		Surplus	
	%	N	%	N	%	N	%	N
Phobjikha	9.1	1	27.3	3	45.5	5	18.2	2
Limukha	0.0	0	28.6	2	71.4	5	0.0	0
Bhutan	5.6	1	27.8	5	55.6	10	11.1	2
Uttaranchal	55	11	45	9	0	0	0	0
HP	15	3	85	17	0	0	0	0
India	35	14	65	26	0	0	0	0
Palpa	20.7	6	51.7	15	17.2	5	10.3	3
Dhankuta	0	0	3.6	1	57.1	16	39.3	11
Nepal	10.5	6	28.1	16	36.8	21	24.6	14

Source: Impact Survey 2004

### Impact on fuelwood savings

Fuelwood was the major source of energy for cooking at the project sites in HP and Uttaranchal, although a few households also used LPG and kerosene. The baseline estimate indicated that about 20% of households in Naila and 14% in Bajeena used LPG. Although 88% of the households in Nager and 71% in Kotla had LPG, biomass-based fuel still contributed to over 93% and 98%, respectively, of total energy consumption. With the gradual degradation of HP's forest resources in the vicinity of the villages, women are finding it increasingly difficult to meet their daily fuelwood requirements, and are often forced to rely on inferior fuels like shrub twigs and dung cakes.

Some energy efficient technologies (improved cooking stoves and pressure cookers) were introduced at the project sites based on the prioritised needs of women beneficiaries. This had some impact on fuelwood saving, depending on the type of technology and the duration of use (Table 5.5). Survey results on the average weekly consumption of fuelwood before and after the project indicated that net savings in fuelwood consumption at the project sites ranged from 13% in Uttaranchal, India, to 53% in Punakha, Bhutan. The average weekly consumption of fuelwood at the project sites in Bhutan was considerably higher than in other project areas even after the savings in fuelwood after the project. The per capita fuelwood consumption in Bhutan (1200 kg per year) is one of the highest, in the world perhaps because of its abundance, proximity, and the cold climatic conditions (RSPN 2004). The use of pressure cookers as the only energy-saving device led to limited gains in fuelwood savings for women in the project sites in Uttaranchal (Bajeena and Naila) compared to those in HP where women adopted multi-functional improved stoves. The impact in Palpa, Nepal, was even higher after the adoption of ICS, with a 35% reduction in fuelwood consumption.

	Before project		After project		Cases (N)	Saving in fuelwood (% decline)
	Mean	SD	Mean	SD		
Phobjikha	199	102	158	109	11	-21
Limukha	257	45	120	30	7	-53
Bhutan	222		143		18	-36
Uttaranchal	107	35	93	31	20	-13
HP	167	28	120	35	20	-28
India	137		107		40	-22
Dhankuta	145	18	114	19	28	-21
Palpa	155	110	101	72	23	-35
Nepal	150		108		51	-28

Source: Impact Survey 2004

## Time saving through water and energy technologies

The baseline scenario in the project sites in India revealed an acute shortage of drinking water due to the drying up of existing natural springs, especially during the summer, forcing women to spend considerable time (three to six hours daily) and effort in collecting water. In HP, the newly-connected water tap was only able to meet a quarter of the total water requirement. In Uttaranchal (Bajeena and Naila), women in the past sometimes had to spend the whole night collecting water from 'naulas' (underground springs). This situation changed after the provision of water harvesting technologies with an average 35% saving in the time taken to collect water (Table 5.6). In India the time saving in collecting water was somewhat offset by an increase in the number of trips – with more water available, women collected much more water than before, but still in less time (Figure 5.1). There was no time saving in water collection in Nepal because there were existing sources of drinking water. However, there was a saving in time in using water after the installation of drip irrigation technology.

The women also saved time through the adoption of energy technologies at the project sites. Prior to the project, women had to make many trips to collect fuelwood from the forests to meet their daily energy needs. Following the adoption of new technologies, women reported saving about 20-30% of the total time they were taking to collect fuelwood (Table 5.6).

	Fuelwood collection time (hours/month)			Water collection time (hours/day)		
	Before	After	% Saving in time	Before	After	% Saving in time
Phobjikha	60	45	-26	3.7	1.1	-70
Limukha	58	34	-41	4.5	2.5	-45
Bhutan	59	41	-30	4.3	1.6	-62
Uttaranchal	22	19	-17	3.5	2.2	-35
HP	101	82	-19	6.0	4.0	-34
India	63	51	-18	4.8	3.1	-35
Palpa	29	24	-17	0.2	0.2	0
Dhankuta	66	53	-20	2.8	2.8	0*
Nepal	50	40	-20	1.7	1.7	0

Source: Impact Survey 2004 \* Respondents also reported a considerable reduction in time spent as a result of drip irrigation.



**Figure 5.1: Collecting water from the recharged spring in Bajena, Uttaranchal**

## **Perceived Impacts**

The survey used a set of qualitative indicators to assess the impacts of pilot interventions on various aspects of the women's lives. They were asked to classify whether the existing situation for selected attributes of livelihoods had 'increased a lot', 'increased', 'remained the same', 'decreased', or 'decreased a lot' compared to before the interventions. The tables in the following sections show the judgments of the women respondents on the status of different indicators, reflecting the impacts of knowledge and skills, improved access to technologies, reduced workload and drudgery, use of saved time for productive income-generating activities, access to credit facilities, increased household income, and others. While the record across the regions varied, overall the improvements were encouraging. In most cases the majority of the women saw some improvement in the majority of indicators.

### **Water- and energy-related knowledge and skills enhancement**

The question on knowledge and skills on water and energy related in particular to the combination of awareness and technology management skills the women acquired through different training sessions. A large majority of the women reported that their knowledge and skills on energy and water technologies had increased after the implementation of the project in their villages (Table 5.7).

### **Improved access to drinking water and its availability for other uses**

Overall the majority of the respondents in India and Nepal, and all of those in Bhutan, experienced improved access to drinking water after the project (Table 5.8). In Palpa, there was an adequate water supply system before the project so most women reported the situation

	Increased a lot	Increased	Same	Decreased	Decreased a lot
Knowledge & skills on energy technologies					
Phobjikha	63.6	36.4	0.0	0.0	0.0
Limukha	83.3	16.7	0.0	0.0	0.0
Bhutan*	70.6	29.4	0.0	0.0	0.0
Uttaranchal	80.0	20.0	0.0	0.0	0.0
HP	35.0	45.0	20.0	0.0	0.0
India*	57.5	32.5	10.0	0.0	0.0
Palpa	25.0	40.0	35.0	0.0	0.0
Dhankuta	0.0	100.0	0.0	0.0	0.0
Nepal*	10.4	75.0	14.6	0.0	0.0
Knowledge & skills on water technologies					
Phobjikha	72.7	27.3	0.0	0.0	0.0
Limukha	66.7	33.3	0.0	0.0	0.0
Bhutan*	70.6	29.4	0.0	0.0	0.0
Uttaranchal	15.8	63.2	21.1	0.0	0.0
HP	40.0	40.0	20.0	0.0	0.0
India*	28.2	51.3	20.5	0.0	0.0
Palpa	26.3	52.6	21.1	0.0	0.0
Dhankuta	0.0	100.0	0.0	0.0	0.0
Nepal*	10.9	80.4	8.7	0.0	0.0
Source: Impact Survey 2004 * Averages weighted according to number of respondents					

to be the same as before. In India, just over one-third of the women in HP perceived no change in the drinking water situation after the project, perhaps because of the size of the water harvesting tank. In India and Palpa in Nepal, the majority of women felt the bathing water situation and water for livestock was unchanged, whereas in Bhutan most women felt it had improved. One-third of women in Bhutan and the majority in India, especially in Uttaranchal, perceived no change in availability of water for vegetable gardening, whereas the great majority in Nepal experienced some improvement. This reflects the uptake of wastewater/drip technology in Nepal.

### Impact on drudgery reduction and time saving

About 95% of the women in Uttaranchal, 75% in Dhankuta and 70% at both sites in Bhutan experienced reduced drudgery through introduction of the water-related technologies (Table 5.9). Because of the existing drinking water source in Palpa, more than half of the women found no change (or worsening) in the drudgery associated with collecting water, but at both sites in Nepal there was a considerable reduction in water associated drudgery resulting from the introduction of (semi-automatic) drip irrigation (Table 5.9). Most of the women in India, and more than half in Bhutan and Nepal, experienced drudgery reduction as a result of the energy-related technologies (Table 5.9).

### Use of saved time for productive activities and leisure

The introduction of better water- and energy-related technologies had a positive impact on the workload and time use of women. Almost all the women in Bhutan and nearly two-thirds to

	Increased a lot	Increased	Same	Decreased	Decreased a Lot
Supply of drinking water					
Phobjikha	100.0	0.0	0.0	0.0	0.0
Limukha	33.3	66.7	0.0	0.0	0.0
Bhutan*	76.5	23.5	0.0	0.0	0.0
Uttaranchal	0.0	80.0	20.0	0.0	0.0
HP	0.0	64.7	35.3	0.0	0.0
India*	0.0	73.0	27.0	0.0	0.0
Palpa	5.9	0.0	94.1	0.0	0.0
Dhankuta	0.0	100.0	0.0	0.0	0.0
Nepal*	2.2	62.2	35.6	0.0	0.0
Water use for livestock					
Phobjikha	27.3	45.5	27.3	0.0	0.0
Limukha	0.0	100.0	0.0	0.0	0.0
Bhutan*	17.6	64.7	17.6	0.0	0.0
Uttaranchal	0.0	0.0	100.0	0.0	0.0
HP	0.0	60.0	40.0	0.0	0.0
India*	0.0	30.0	70.0	0.0	0.0
Palpa	11.8	5.9	82.4	0.0	0.0
Dhankuta	0.0	100.0	0.0	0.0	0.0
Nepal*	4.4	64.4	31.1	0.0	0.0
Water use for productive activities (kitchen garden)					
Phobjikha	9.1	54.5	36.4	0.0	0.0
Limukha	0.0	50.0	16.7	33.3	0.0
Bhutan*	5.9	52.9	29.4	11.8	0.0
Uttaranchal	0.0	10.0	85.0	5.0	0.0
HP	5.0	55.0	35.0	5.0	0.0
India*	2.5	30.0	60.0	7.5	0.0
Palpa	25.0	55.0	20.0	0.0	0.0
Dhankuta	0.0	100.0	0.0	0.0	0.0
Nepal*	10.9	80.4	8.7	0.0	0.0
Water use for bathing					
Phobjikha	72.7	27.3	0.0	0.0	0.0
Limukha	33.3	66.7	0.0	0.0	0.0
Bhutan*	58.8	41.2	0.0	0.0	0.0
Uttaranchal	0.0	0.0	100.0	0.0	0.0
HP	10.0	45.0	45.0	0.0	0.0
India*	5.0	22.5	72.5	0.0	0.0
Palpa	6.7	0.0	93.3	0.0	0.0
Dhankuta	0.0	100.0	0.0	0.0	0.0
Nepal*	2.3	65.1	32.6	0.0	0.0
Source: Impact Survey 2004 * Averages weighted according to number of respondents					

	Increased a lot	Increased	Same	Decreased	Decreased a lot
Water-related drudgery					
Phobjikha	20.0	10.0	0.0	10.0	60.0
Limukha	0.0	16.7	16.7	66.7	0.0
Bhutan*	12.5	12.5	6.3	31.3	37.5
Uttaranchal	0.0	0.0	5.0	80.0	15.0
HP	5.0	35.0	25.0	35.0	0.0
India*	2.5	17.5	15.0	57.5	7.5
Palpa	16.7	0.0	44.4	38.9 <sup>+</sup>	0.0
Dhankuta	0.0	25.0	0.0	75.0 <sup>+</sup>	0.0
Nepal*	6.5	14.6	18.4	60.4	0.0
Energy-related drudgery					
Phobjikha	0.0	30.0	10.0	40.0	20.0
Limukha	0.0	33.3	16.7	50.0	0.0
Bhutan*	0.0	31.3	12.5	43.8	12.5
Uttaranchal	0	0	5	95	0
HP	5	5	10	75	5
India*	2.5	2.5	7.5	85	2.5
Palpa	5.3	10.5	15.8	36.8	31.6
Dhankuta	0	25	0	75	0
Nepal*	2.8	2	6.4	58.9	12.8
Source: Impact Survey 2004 * Average s weighted according to number of r espondents <sup>+</sup> Drudgery reduced by drip irrigation					

three-quarters overall of those in India (especially Uttaranchal) and Nepal (especially Dhankuta) used the saved time for productive income-generating activities (Table 5.10). The women's group in Dhankuta is already in the process of registering itself as cooperative based on the sizeable group savings (NRs 120,000) and their experience in micro-finance activities, which they have tapped to initiate various income-generating activities with marketing support from a local NGO. Other enabling mechanisms such as economic opportunities, skills training, and proximity to the market are equally important. Even women who did not perceive a time saving in water and fuelwood collection were involved in productive income-generating activities.

At the same time, women also appreciated the importance of leisure time for home life (rest, child care, and others). For example, prolonged sleeping time (by three hours) was one of the major impacts reported by the women's group in HP after the adoption of the rainwater harvesting tank and multifunctional ICS. With these technologies, women no longer have to wake up early in the morning and work until late in the evening.

### Perceived impacts on health

Almost all the women in Nepal, and half in HP, India, felt that the level of indoor pollution had been reduced – mainly as a result of the use of ICS (Table 5.11). In Bhutan and Uttaranchal, India, little or no change was perceived – reflecting the much lower rate of adoption of ICS. In Bhutan, use of LPG was just starting at the time of the survey and was generally restricted to special cooking and not used for space heating.

	Increased a lot	Increased	Same	Decreased	Decreased a lot
Phobjikha	27.3	72.7	0.0	0.0	0.0
Limukha	0.0	80.0	0.0	20.0	0.0
Bhutan*	18.8	75.0	0.0	6.3	0.0
Uttaranchal	5.3	78.9	15.8	0.0	0.0
HP	0.0	36.8	63.2	0.0	0.0
India*	2.6	57.9	39.5	0.0	0.0
Palpa	7.7	23.1	69.2	0.0	0.0
Dhankuta	0.0	96.4	0.0	3.6	0.0
Nepal*	2.4	73.2	22.0	2.4	0.0

Source: Impact Survey 2004 \* Average s weighted according to number of respondents

Furthermore, 90% of women in Dhankuta, 60% in Palpa and Uttaranchal, and 45% in HP felt that the frequency of illness due to smoke had decreased. All the women in Bhutan and Dhankuta, and around half of those in Palpa and India considered that the level of hygiene and sanitation in the kitchen had improved after the adoption of the new technologies (Table 5.11). Improvement resulted from the adoption of toilets as well as an improved kitchen environment, e.g., through the use of kitchen racks.

### **Perceived adequacy of support from the project**

The great majority of women at all sites felt that the level of support from the project was adequate or more than adequate in all areas — meeting water and energy needs, skills development, and access to loans for income-generating activities (Table 5.12). In India, and especially Uttaranchal, the women were somewhat less satisfied with the level of support in meeting energy needs than in Bhutan and Nepal, and in Nepal, especially Palpa, they were less satisfied with the support to meet water needs. In Dhankuta they were less satisfied with support for skills development and access to loans, reflecting the higher expectations arising from their decision to form a women’s cooperative to run micro-enterprises.

### **Perceived impact on access to credit, skills training, and income-generating opportunities**

For most women surveyed, the main reasons for joining the group were the desire to meet their water and energy needs and the expectation that they would learn new skills that would enable them to take up income-earning opportunities. For the great majority, these expectations were fulfilled (Table 5.13).

In Nepal and Uttaranchal, the majority of women considered that their access to credit had increased. In HP slightly less than half experienced this improvement, and in Bhutan only a quarter. The credit scheme was only just coming into operation in Bhutan at the end of the project period when the survey was conducted. The overwhelming majority of women at all sites considered they had had improved access to training in employable skills. Most of them had been able to use their skills for income-generating activities, although fewer in India than in Nepal or Bhutan. Women have thus been able to increase their incomes. Between a half and three quarters of women at all sites, and nearly all in Dhankuta, reported that their farm production had increased after the adoption of the new farming technologies such as organic composting, vermicomposting, and drip irrigation.

	Increased a Lot	Increased	Same as Before	Decreased	Decreased a Lot
Indoor pollution due to smoke					
Phobjikha	0.0	0.0	90.9	0.0	9.1
Limukha	0.0	0.0	66.7	33.3	0.0
Bhutan*	0.0	0.0	82.4	11.8	5.8
Uttaranchal	0.0	0.0	78.9	21.1	0.0
HP	0.0	0.0	45.0	50.0	5.0
India*	0.0	0.0	61.5	36.1	2.4
Palpa	0.0	0.0	10.0	15.0	75.0
Dhankuta	0.0	3.6	0.0	96.4	0.0
Nepal*	0.0	2.1	4.2	62.5	31.3
Frequency of sickness due to smoke related diseases					
Phobjikha	0.0	0.0	90.9	9.1	0.0
Limukha	0.0	16.7	50.0	33.3	0.0
Bhutan*	0.0	5.9	76.5	17.6	0.0
Uttaranchal	0.0	0.0	35.0	65.0	0.0
HP	0.0	5.0	50.0	40.0	5.0
India*	0.0	12.5	42.5	52.5	2.5
Palpa	30.0	0.0	10.0	20.0	40.0
Dhankuta	0.0	7.1	0.0	92.9	0.0
Nepal*	12.5	4.2	4.2	62.5	16.7
Improved levels of hygiene & sanitation					
Phobjikha	60.0	40.0	0.0	0.0	0.0
Limukha	83.3	16.7	0.0	0.0	0.0
Bhutan*	68.8	31.3	0.0	0.0	0.0
Uttaranchal	0.0	60.0	35.0	5.0	0.0
HP	0.0	44.4	55.6	0.0	0.0
India*	0.0	52.6	44.7	2.6	0.0
Palpa	27.8	55.6	16.7	0.0	0.0
Dhankuta	0.0	100	0.0	0.0	0.0
Nepal*	11.1	82.2	6.7	0.0	0.0
Source: Impact Survey 2004 * Averages weighted according to number of respondents					

	Not Adequate	Less Adequate	Adequate	More adequate	Highly Adequate
Meeting energy needs					
Phobjikha	0.0	0.0	0.0	50.0	50.0
Limukha	0.0	0.0	0.0	66.7	33.3
Bhutan*	0.0	0.0	0.0	60.0	40.0
Uttaranchal	0.0	15.0	40.0	45.0	0.0
HP	0.0	6.7	26.7	53.3	13.3
India*	0.0	11.4	34.3	48.6	5.7
Palpa	5.0	5.0	30.0	45.0	15.0
Dhankuta	0.0	3.6	10.7	53.6	32.1
Nepal*	2.1	4.2	18.8	50.0	25.0
Meeting water needs					
Phobjikha	0.0	0.0	0.0	0.0	100.0
Limukha	0.0	0.0	0.0	0.0	100.0
Bhutan*	0.0	0.0	0.0	22.2	77.8
Uttaranchal	0.0	0.0	25.0	25.0	50.0
HP	0.0	0.0	26.7	46.7	26.7
India*	0.0	0.0	25.7	34.3	40.0
Palpa	5.0	20.0	30.0	35.0	10.0
Dhankuta	7.4	3.7	29.6	11.1	48.1
Nepal*	6.4	10.6	29.8	21.3	31.9
Skills development					
Phobjikha	0.0	0.0	0.0	33.3	66.7
Limukha	0.0	0.0	0.0	66.7	33.3
Bhutan*	0.0	0.0	0.0	72.7	27.3
Uttaranchal	0.0	0.0	26.3	63.2	10.5
HP	0.0	0.0	57.1	28.6	14.3
India*	0.0	0.0	39.4	48.5	12.1
Palpa	4.8	14.3	28.6	23.8	28.6
Dhankuta	0.0	28.0	24.0	28.0	20.0
Nepal*	2.2	21.7	26.1	26.1	23.9
Loan for income-generating activities					
Phobjikha	0.0	0.	50.0	50.0	0.0
Limukha	0.0	0.0	0.0	100.0	0.0
Bhutan*	0.0	0.0	25.0	62.5	12.5
Uttaranchal	0.0	0.0	40.0	60.0	0.0
HP	0.0	7.1	21.4	50.0	21.4
India*	0.0	2.9	32.4	55.9	8.8
Palpa	10.5	5.3	31.6	26.3	26.3
Dhankuta	9.5	33.3	33.3	19.0	4.8
Nepal*	10.0	20.0	32.5	22.5	15.0
Source: Impact Survey 2004 * Average s weighted according to number of respondents					

	Increased a lot	Increased	Same	Decreased	Decreased a lot
Access to credit facilities					
Phobjikha	0.0	27.3	72.7	0.0	0.0
Limukha	0.0	16.7	66.7	16.7	0.0
Bhutan*	0.0	23.5	70.6	5.9	0.0
Uttaranchal	45	55	0	0	0
HP	0	45	55	0	0
India*	22.5	50	27.5	0	0
Palpa	42.1	47.4	10.5	0	0
Dhankuta	0	100	0	0	0
Nepal*	17	78.7	4.3	0	0
Access to employable skills training for income -generating activities					
Phobjikha	20.0	80.0	0.0	0.0	0.0
Limukha	16.7	66.7	16.7	0.0	0.0
Bhutan*	18.8	75.0	6.3	0.0	0.0
Uttaranchal	15	65	20	0	0
HP	15	55	30	0	0
India*	15	60	25	0	0
Palpa	61.1	33.3	5.6	0	0
Dhankuta	21.4	78.6	0	0	0
Nepal*	37	60.9	2.2	0	0
Access to income generating opportunities					
Phobjikha	0.0	100.0	0.0	0.0	0.0
Limukha	0.0	83.3	16.7	0.0	0.0
Bhutan*	0.0	94.1	5.9	0.0	0.0
Uttaranchal	20	60	20	0	0
HP	5	65	30	0	0
India*	12.5	62.5	25	0	0
Palpa	35	60	5	0	0
Dhankuta	0	100	0	0	0
Nepal*	14.6	83.3	2.1	0	0
Farm production					
Phobjikha	9.1	45.5	45.5	0.0	0.0
Limukha	0.0	66.7	33.3	0.0	0.0
Bhutan*	5.9	52.9	41.2	0.0	0.0
Uttaranchal	20	55	25	0	0
HP	5.3	63.2	31.6	0	0
India*	12.8	59	28.2	0	0
Palpa	33.3	13.3	53.3	0	0
Dhankuta	0	96.4	0	3.6	0
Nepal*	11.6	67.4	18.6	2.3	0
Source: Impact Survey 2004 * Average s weighted according to number of respondents					

## Assessing the Organisational Capacity Building of Women and Empowerment

The project strongly emphasised empowerment of the women involved. Great importance was attached to social mobilisation as a mechanism for organisational capacity building, a dynamic process by which women living in a community are organised into groups to share and discuss problems, to seek solutions by mobilising their own and outside resources, and to become more active participants in the decision-making processes that affect their lives as individuals, households and members of the community. The objective is to create self-governing/empowering community organisations which take responsibility for, and gain control over, the decision-making process in community-level activities. This is achieved through ensuring ownership (or genuine participation), sharing benefits equitably, and transparency in decision making, accountability, productivity, and sustainability. An attempt is made in the following to assess these through a set of indicators that reflect the various dimensions of women's organisational capacity building at the grassroots level, based on the information obtained from the sample survey.

Community empowerment takes place when individual human capabilities (interpersonal or psychological empowerment) are blended with social capabilities (organisational empowerment) through awareness building and training. This allows individuals and groups to organise and mobilise themselves towards a commonly defined goal or towards solving collective problems. Organisational factors influencing community empowerment include such things as participation, leadership, interdependence (bonding, social capital), and programme management. Women's empowerment encompasses some unique additional elements as women not only comprise a crosscutting category of individuals that overlaps with disempowered subsets of society (the poor, ethnic minorities, and so on), they also face household and interfamilial relations as a source of their disempowerment in a way that is not true for other disadvantaged groups.

Social capital formation at the local level is the basic building block for ensuring the sustainability of all other forms of capital – human, physical, financial, and natural – and better development outcomes. Social capital is an accumulation of various types of social, psychological, cultural, cognitive, institutional, and related assets that increase mutually beneficial cooperative behaviour, a behaviour that is productive for others as well as for one's self. Experience suggests that local-level institutions with high social capital are in general relatively more successful than others. The core issue in this context is how to measure social capital. Keeping in view the major area of concern of the project in the promotion of women's groups together with the underlying principle of participatory/self-governing institutional development, the following major dimensions of organisational capacity (DOC) building were identified for assessing the building of women's organisational capacity. (See UNDP, 2004 for a conceptual and empirical exposition of the application of measuring social capital.)

- Decision-making process
- Degree of participation
- Programme knowledge /transparency
- Leadership
- Accountability
- Coordination and interdependencies
- Trust and solidarity
- Conflict management capacity

Box 5.1 shows the rationale behind these DOCs. Several qualitative indicators were used to assess the perceptive judgment of women respondents on DOC. The indicators were measured using a standard scoring method rated on a five-point ordinal scale between the most desirable (5 points) and least desirable (1 point) outcome. The average index for each indicator was then derived by dividing the total score by the total sample cases. The total score is simply the actual response count of an indicator multiplied by its respective predefined value (1 to 5). Composite indices for different dimensions are then derived by taking the average of the respective individual indices. Likewise, the overall index of institutional capacity building was computed by taking the simple average of the composite index of each dimension. Such an aggregated composite index of each organisation can be further classified into five major groups indicating the state of the organisation using the following rating scale.

State of local organisation	Score
Self -sustaining	4.51 and above
Well-functioning	3.51 to 4.5
Satisfactory	2.51 to 3.5
Fair but unstable	1.51 to 2.5
Not functioning	Below 1.5

**Status of organisational capacity building**

The relative positions of different dimensions of organisational capacity building and underlying indicators across the project sites in Bhutan, India, and Nepal are shown in Table 5.14 and summarised in Figure 5.2. The overall index of organisational capacity building ranged from 3.35 in HP to 3.95 in Palpa (maximum value 5). Taking all groups together in each country, the average score for organisational capacity building was 3.92 in Nepal, slightly higher than in Bhutan (3.67) and India (3.53). In India, the average DOC score lay between 3.09 (capacity for conflict management) and 3.88 (decision-making process), while in Nepal it ranged from 3.71 (capacity for conflict management) to as high as 4.14 (trust and solidarity). In Bhutan the average score ranged from 2.96 (linkage and coordination) to 4.7 (decision-making process) (Figure 5.3). The relatively higher value of Uttaranchal compared to HP is due to its higher position in all dimensions of organisational capacity building except for organisational linkages and capacity for conflict management (Figure 5.4). Likewise, women’s organisational capacity building in Palpa surpassed that in Dhankuta mainly due to their higher position in five dimensions (decision-making process, degree of participation, accountability, leadership quality and capacity for conflict management) (Figure 5.5).

In aggregate, the relative position of organisational capacity building in Nepal was found to be slightly stronger than that of Bhutan and India in terms of almost all dimensions except decision-making criteria, which scored similarly in all cases (Table 5.14). The difference in the relative status of different dimensions of organisational capacity building between the project sites in Bhutan, India, and Nepal can be better judged from the spider-web diagram (Figure 5.2).

Overall, the average score for the decision-making process, participation, leadership, and trust and solidarity among group members was rated as quite high (about 4 out of a maximum 5). The perceived level of partnership/alliances with other organisations and capacity for conflict management including transparency and accountability were weaker.

## Box 5.1: Dimensions of institutional capacity building and underlying indicators

**Decision-making process:** Proper understanding of how group decisions are made in the formulation of rules and regulations, programme selection, and programme implementation becomes important for the sustainability of the grassroots institution. If decisions are not made with the full participation and consensus of group members, other crucial attributes of institutional capacity building are unlikely to emerge and be sustained. The group's decision-making process is assessed by specifying a number of criteria: consensus, persuading members to reach consensus, majority rule, and imposition by the outsiders/project.

**Degree of participation:** The types of indicators designed to monitor the degree of participation are influenced by organisational growth, group behaviour, and group self-reliance. In the present study, the participation of group members was assessed in terms of their degree of participation in the planning, implementation, and maintenance of the pilot projects, including their participation in making rules and regulations.

**Knowledge and transparency:** Transparency in project information and the decision-making process means that decisions have to be made so they are easily understood by all participants, who should be fully aware of and responsible for the outcome of their decisions. Transparency in the decision-making process is measured by assessing the group members' degree of knowledge and information about project objectives, about group rules and regulations, about the revolving fund, and about group savings and investment.

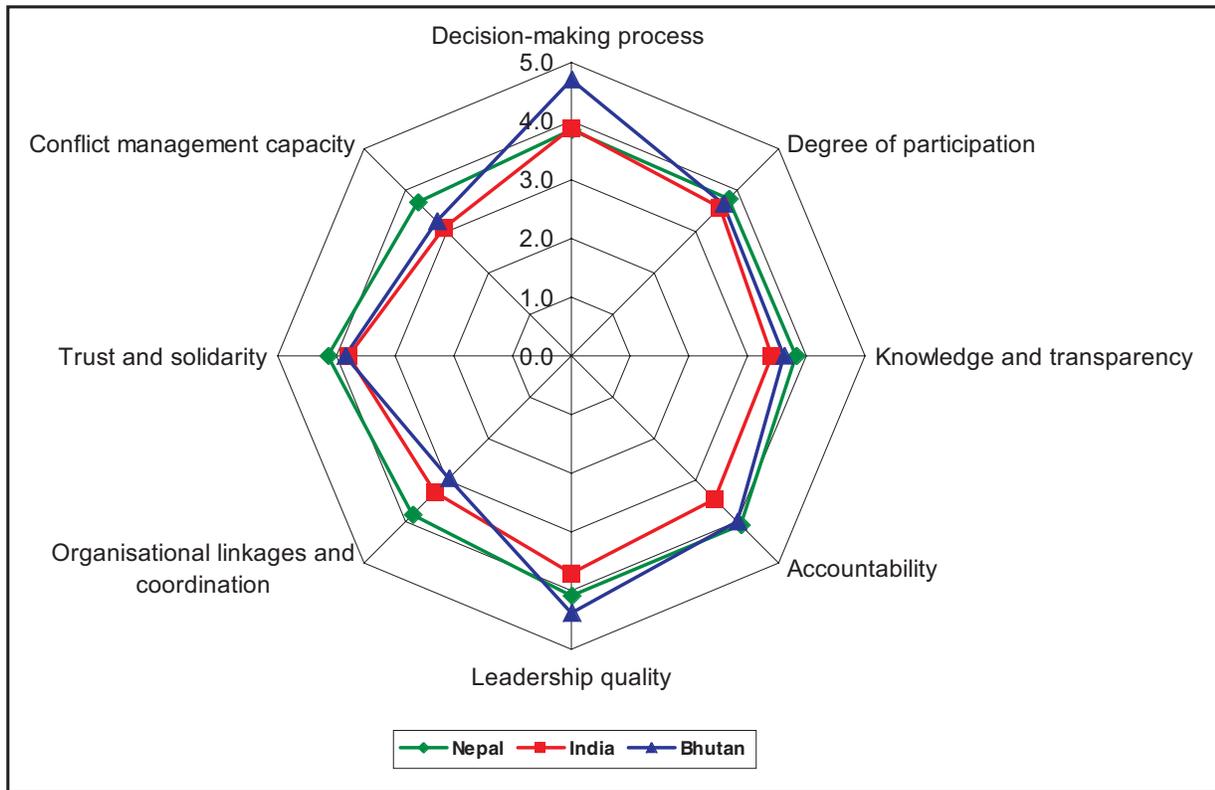
**Accountability:** Related to transparency is the degree of two-way accountability of the group to its members and vice-versa. Three indicators included to capture this critical element of group empowerment include the accountability of women members for group decisions, the group's accountability to its members, and NGO/social mobilisers' accountability to the group members.

**Leadership quality:** The success or failure of grassroots organisations, as long-enduring participatory institutions, depends among other things upon how honest, devoted, responsible, and efficient (skillful) the leaders are in managing group activities in a sustained way. The most effective and sustainable leadership is the one that follows the decisions and desires of the community as a whole, playing an enabling and facilitating role.

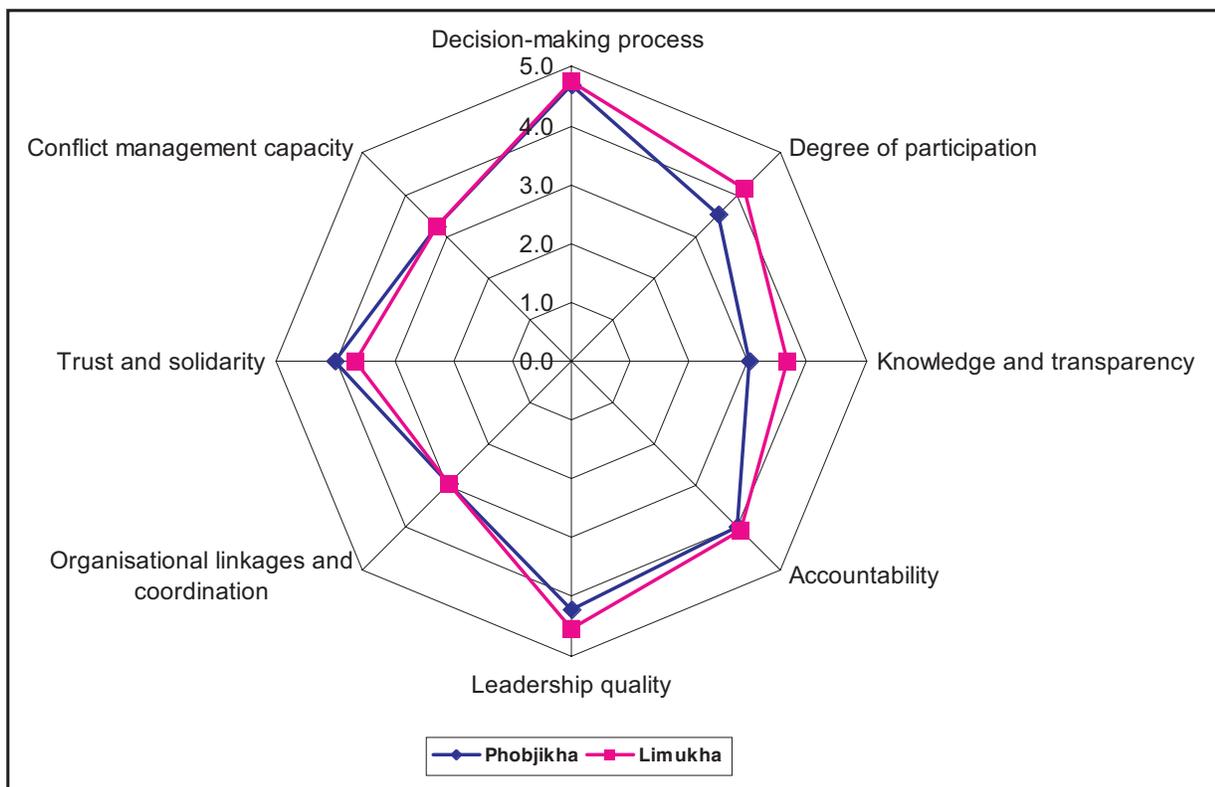
**Organisational linkages and coordination:** The sustainability and capacity for the organisation's self-help can also be judged by the extent to which the local organisation has established its networking and partnership/alliances with other organisations, both vertically and horizontally. A sound rapport established by the group with other entities such as village organisations, district line agencies, financial institutions, and other village-level government and NGO-sponsored groups for support will result in the multiple benefits of sharing experiences, knowledge/information, and resources.

**Trust and solidarity:** Mutual trust and cooperation among members of communities is a significant factor in explaining institutional performance. The features of social organisation that enhance trust and cooperation increase community well-being by making institutions more democratic and efficient in delivering public goods and services. The degree to which members of the community trust each other has been measured by three sets of indicators, namely trust and solidarity among group members, trust/unity between group and non-group members, and levels of self confidence.

**Conflict management capacity:** At the micro-level, unmanaged conflict is a threat to the survival of the group and, at the least, tends to make the group less effective. Conflict can occur within groups (intra-group conflict) or among groups (inter-group conflict), and arises from differences in values, beliefs, and attitudes regarding different issues (inclusion/participation, control over resources and benefit sharing etc). Group members' perception of the degree of conflict management both within and between groups has been assessed, along with the groups' ability to claim government services and to work with other groups for mutual benefit.



**Figure 5.2: Status of women's organisational capacity at project sites in Bhutan, India, and Nepal**



**Figure 5.3: Status of women's organisational capacity in Bhutan: Phobjikha versus Limukha**

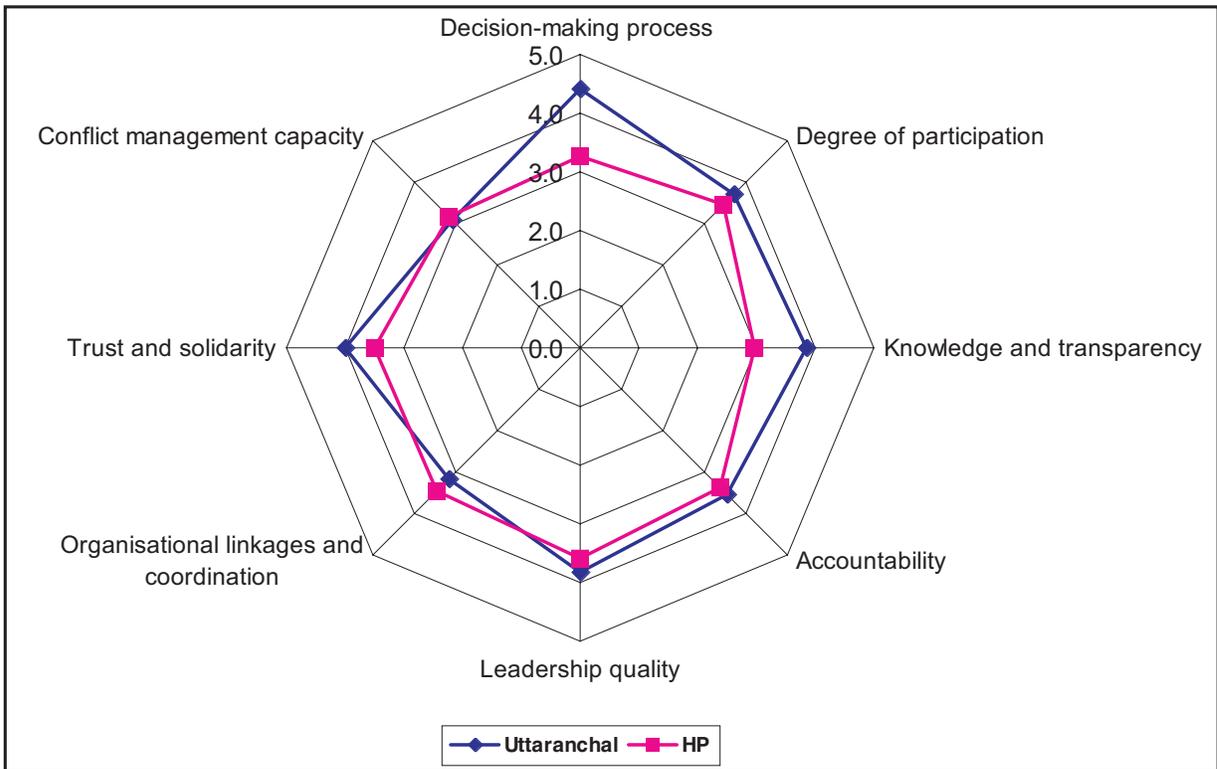


Figure 5.4: Status of women's organisational capacity in India: Uttarakhand versus HP

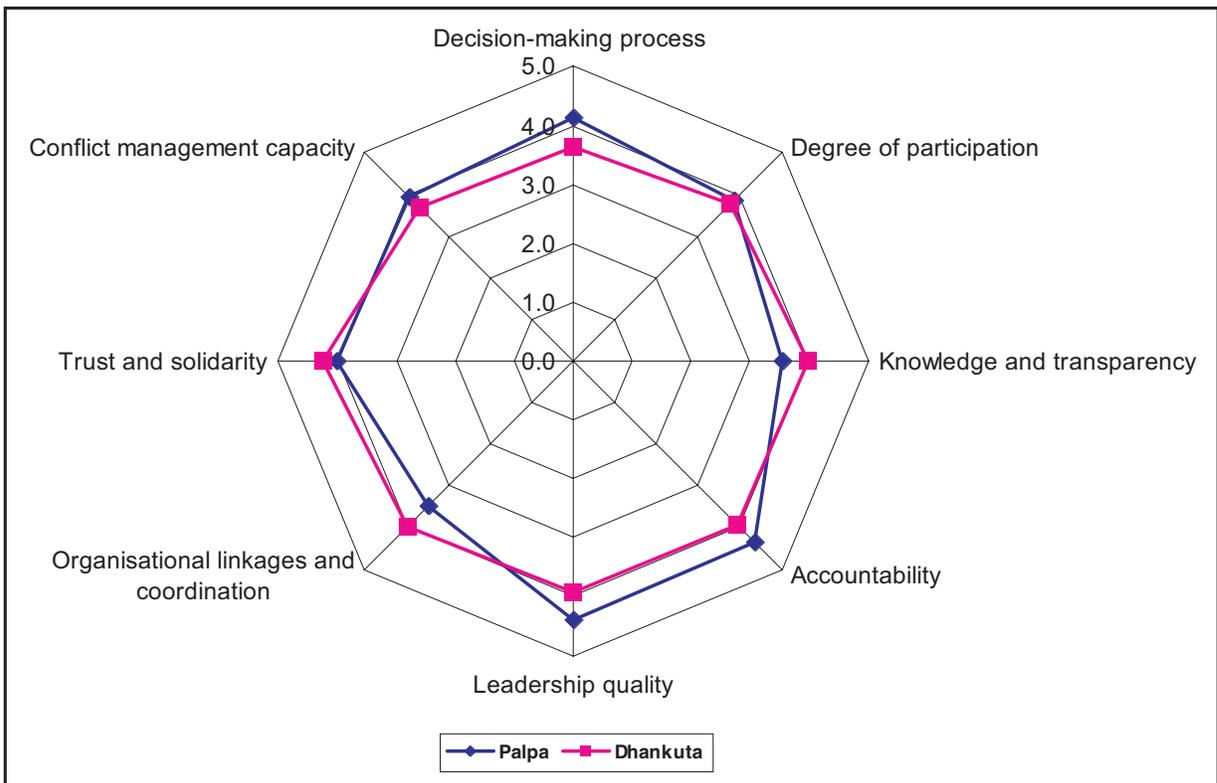


Figure 5.5: Status of women's organisational capacity in Nepal: Palpa versus Dhankuta

	Phobjikha	Limukha	Bhutan	U'chal*	HP	India	Palpa	Dhankuta	Nepal
Decision-making process	4.69	4.73	4.70	4.40	3.27	3.88	4.11	3.63	3.85
Committee formation	5.00	4.43	4.78	4.45	4.41	4.43	3.81	5.00	4.43
Making rules & regulations	4.55	4.71	4.61	4.50	3.65	4.11	4.46	5.00	4.74
Selecting programme/technology	4.64	4.83	4.71	4.25	2.71	3.54	4.12	2.86	3.45
Preparing action plan	4.73	4.67	4.71	4.45	2.82	3.70	4.08	3.21	3.63
Project implementation	4.55	5.00	4.71	4.35	2.78	3.61	4.08	2.07	3.02
Degree of participation	3.50	4.14	3.64	3.72	3.43	3.59	3.87	3.75	3.79
Making rules	4.00	4.43	4.17	4.10	4.41	4.24	4.35	4.04	4.16
Needs identification	3.50	4.25	3.75	3.80	3.47	3.65	4.06	4.00	4.02
Action plan for pilot programme	3.22	4.00	3.30	3.65	2.81	3.28	3.80	4.00	3.93
Implementation of the pilot programme	3.44	4.00	3.58	3.65	3.29	3.49	3.80	4.00	3.93
Monitoring the programme	3.33	4.00	3.40	3.40	3.18	3.30	3.33	2.70	2.93
Knowledge & transparency	3.01	3.67	3.63	3.84	2.96	3.41	3.53	3.96	3.81
Project goal/objective	1.00	4.00	3.63	3.85	2.79	3.33	3.20	3.96	3.70
Saving & investment	3.91	4.00	3.94	3.47	2.74	3.11	3.87	3.96	3.93
Revolving fund	3.73	3.50	3.65	4.21	3.05	3.63	3.07	3.96	3.65
Rules & regulations	3.40	3.17	3.31	3.84	3.26	3.55	4.00	3.96	3.98
Accountability	3.97	4.06	4.00	3.53	3.37	3.45	4.36	3.93	4.08
Accountability to group decision	3.91	4.00	3.94	3.53	3.53	3.53	4.13	3.93	4.00
Group accountable to members	3.91	4.17	4.00	3.42	3.05	3.24	4.33	3.93	4.07
Accountability of NGO social mobiliser	4.09	4.00	4.06	3.63	3.53	3.58	4.60	3.93	4.16
Leadership quality	4.20	4.54	4.39	3.81	3.59	3.72	4.38	3.91	4.10
Leaders honesty/sincerity	4.10	4.25	4.17	4.00	4.06	4.03	4.47	4.00	4.20
Dedication	4.30	4.70	4.50	3.79	3.00	3.45	4.37	3.07	3.60
Responsible/accountable	4.40	4.73	4.57	3.79	3.56	3.69	4.42	4.57	4.51
Skill & capacity	4.00	4.50	4.33	3.67	3.75	3.71	4.26	4.00	4.11
Linkage and coordination	2.97	2.93	2.96	3.15	3.47	3.31	3.47	3.99	3.83
With other group/SHGs	3.00	2.40	2.80	3.85	3.84	3.85	3.58	3.96	3.85
With district level line agencies	3.10	3.00	3.07	3.20	3.21	3.21	3.50	4.00	3.85
With financial institutions	2.80	3.40	3.00	2.40	3.37	2.87	3.33	4.00	3.80
Trust & solidarity	4.00	3.67	3.86	4.00	3.51	3.79	4.00	4.23	4.14
Trust & solidarity among group members	4.20	4.00	4.12	4.11	4.07	4.09	4.24	4.71	4.51
Trust/unity between group & non - group members	3.50	3.14	3.35	3.74	3.14	3.48	3.57	3.96	3.83
Level of self confidence	4.30	3.86	4.12	4.16	3.33	3.79	4.19	4.00	4.08
Strength for conflict mgnt.	3.25	3.21	3.23	3.07	3.14	3.09	3.90	3.69	3.71
Strength to claim gov . services	3.00	3.00	3.00	2.26	3.08	2.59	3.75	3.67	3.68
Working with other groups for mutual benefit	3.00	3.00	3.00	2.89	3.00	2.94	3.29	3.67	3.59
Conflict mgnt . within group	4.00	3.83	3.94	3.79	3.31	3.57	4.08	3.71	3.83
Conflict mgnt . between groups	3.00	3.00	3.00	3.32	3.19	3.26	4.50	3.70	3.76
Overall index	3.56	3.74	3.67	3.69	3.35	3.53	3.95	3.89	3.92

Source: Impact Survey 2004 \* Uttaranchal

The measures of organisational capacity building of women have important policy implications for building the social skills of external agencies approaching local communities to facilitate social capital formation and organisational empowerment. Such social skills include ways of approaching local communities, methods for facilitating group formation/institution building, skills for fostering group participation (especially women's groups), conducting participatory planning, supporting networks/linkages, and identifying ways of sustaining the participation of women and other marginalised sections of society. The values needed by external agencies are transparency and honesty of purpose; respect for existing knowledge, experience, and views of local women and men; and listening to the poor as a process of learning-by-doing. No 'blueprint' is available for the formation and enrichment of social capital as a basic ingredient for building this critical pillar of empowerment at the community level.

A few examples of the progress achieved in capacity building and empowerment among women are worth re-emphasising. Social empowerment has increased among women in the project areas and they now feel more confident. Their access to credit (for small amounts) has also improved. Besides their strong desire to meet their immediate subsistence needs for water and energy, regular saving and emergency borrowing facilities are another important reason why women have been attracted to the project. Control over the income that they earn is an important indicator of economic empowerment. The majority of women who are generating an income have the freedom to utilise the income they earn, which has also enhanced their economic empowerment.

Self-confidence relating both to women's perception of their capabilities and their actual level of skills and capabilities has contributed to their empowerment. Most women members during the interview stated that their self-confidence had improved after receiving training and forming their own organisation (which provided them with a platform to come together, discuss their problems, nurture social capital, build awareness, address their water and energy problems, and initiate productive activities). With a small amount of savings and a modest scale of investments, the women are generating income through various income-generating activities. Many benefits in terms of health as well as other aspects of social awareness have emerged with spill-over benefits to neighbouring communities. Their husbands, families, neighbours, and communities regard these women as more knowledgeable after the project than before. A process of empowerment has slowly emerged among the women's groups, demonstrating that women can become effective agents of change if they have the opportunity to manage their own lives.

## **Contribution Towards the Achievement of Intended Results**

The project sought to address five key results through a number of interventions (see Annex 1 for details).

- 1) Improved self-sufficiency in energy and water needs
- 2) Enhanced integration of women in the decision-making process in the management and use of water- and energy-related technologies at the household level
- 3) Enhanced capability of women to adopt, implement, and manage clean and renewable energy and water technologies
- 4) Enhanced integration of women in the management of household water and energy resources through the establishment of gender-sensitive and pro-environmental policy

guidelines for designing future programmes for implementation by line agencies and other development organisations

- 5) A reduction in health-related hazards from access to less polluting water and energy technologies.

Various focused training programmes and awareness raising through information sharing (exposure visits) between participating communities, and the organisational capacity building of these women's groups in each of the three countries have contributed towards the achievement of the results. The individual results are described in more detail below.

### **Improved self-sufficiency in energy and water needs**

The contributions of the project in helping meet water and energy needs have been positive according to the majority of the women at the project sites in India and Nepal. In Bhutan, the establishment of the LPG depot together with the construction of a drinking water supply scheme at the Phobjikha site and the solar drier production venture at the Limukha sites have contributed towards meeting the water and energy needs of women in these areas.

Even where the overall quantity of water consumed may not have increased, as in the case of Naila (HP) which has severe water scarcity, the drudgery involved in obtaining water has been significantly reduced, as women do not have to wake up early in the morning to line up to their get water quota. In Bhutan women now have access to both improved quality and quantity of water. In Nepal women have been able to manage the available water better enabling them to use some water to irrigate their fields for vegetable farming. There is little doubt that self-sufficiency in water has improved. The same can be said about energy, judging from the fact that a large number of women have adopted ICS and other fuel saving devices in Nepal and India and in Bhutan have established an LPG depot and solar dryer. These have helped reduce workloads, drudgery, and indoor air pollution.

### **Enhanced integration of women in decision-making**

The formation of women's groups at each project site and the building of their organisational capacity through various gender sensitisation and orientation training and awareness-raising activities has created a forum for women to come together, nurture social capital, build awareness, address their water and energy problems, resolve disputes, and initiate productive and community development activities enthusiastically (Figure 5.6). This forum has been able to trigger a process of community consciousness at various levels, resulting in the integration of women's roles in decision making and a gain in the momentum of women's empowerment.

Recognition of the roles and needs of women in the decision-making process at the household and community levels is slowly emerging at the project sites. There is a growing sense of self-confidence among women about their ability to manage their water and energy technologies. They have begun to share their knowledge within their homes and with community members. The gender sensitisation training and consultation with the community prior to the implementation of the project together with the benefits generated from the adoption of the technologies has been instrumental in influencing men in the family/community to share the decision-making role with women regarding the purchase of technology, its installation, and the sale of skill-based products from income-generating activities. Faster cooking, less pollution in the kitchen, and in some cases (for example, the Kotla site in HP) the availability



**Figure 5.6: Meeting of a women's group in Bhutan**

of hot water through multifunctional ICS, as well as an improved supply of vegetables have also benefited men and the welfare of families as a whole. For instance, it was only after there was an assured supply of hot water in the bathroom that the women in HP were able to convince their husbands about the benefit of the proposed technologies, making their voices heard at the household level. Likewise, the demonstration of recharging water springs through micro-reservoirs and plantation activities (in Bajena, Uttaranchal); establishing technology demonstration model villages (in Palpa and Dhankuta); and an LPG depot (in Phobjikha, Bhutan) have slowly started to gain the attention of local and district planners towards the integration of women's role and concerns in the decision-making process.

To sum up, the project has helped to achieve these changes through the creation of separate women's groups, freeing women from time-consuming drudgery, opening their minds to new technological possibilities, supporting this by creating enabling mechanisms for them to best utilise the freed time, and demonstrating good practices at the community and district level.

### **Enhanced capability of women to adopt, implement and manage technologies**

The training, the creation of the savings and credit groups, the revolving fund, and various awareness-raising activities were instrumental in enhancing both the individual and collective capability of women in the adoption and management of renewable energy and water technologies in the three countries. The training of trainers has been effective in transferring skills to more women. The preparation of manuals for trainees in national languages has helped to further strengthen their skills and knowledge about the use and management of the adopted technologies. Other specialised skills and managerial training provided by the project partners have also been critical in enhancing the capacities of the women.

Women are slowly emerging as successful energy entrepreneurs. Some ICS (women) promoters in Nepal are able to sell more stoves to other women both within and outside the project areas, as their access to potential female clients is not hindered by social constraints. They are selling their stove construction services and making an income. Women in Bhutan are also emerging as energy entrepreneurs with the establishment of solar drier production ventures and the LGP depot. In one project site in India, the women's group demonstrated its ability to find a more permanent solution to the water scarcity problem through an innovative water recharging method.

The establishment of the TDVs initiated and successfully managed by women's groups in Nepal is another innovative example of enhanced capacity building of women. Women operate and manage the TDVs in order to speed up the transfer of field-tested technologies that are operating in their member's homes to other areas. Many women from neighbouring districts have already visited the TDVs to learn about the technologies.

With respect to collective capabilities (organisational empowerment), the assessment of organisational capacity building of women at the project sites indicates that the women's organisations are functioning well and are in the process of becoming self-sustaining. All these illustrate the increased self-esteem and confidence of women who are slowly emerging as potential change agents in society.

### **Enhanced integration of women through gender-sensitive and pro-environmental policy guidelines and institutional frameworks**

Based on the impacts and lessons learned from the project experiences in each country, gender-sensitive policy guidelines have been prepared to enhance the integration of women in the management of household water and energy. The policy guidelines have been prepared based on the inputs provided by the national partners in consultation with the steering committees formed in each country. During this process, existing national policies and programmes on women and energy in each country were reviewed and the gaps identified. The key findings emerging from each country were further discussed during a Second Regional Stakeholder Workshop held in Kathmandu (November 2004), which helped chart out the policy framework. The guidelines and training manuals that have been prepared through extensive consultation are expected to serve as policy advocacy tools for better design of future programmes for implementation by line agencies and other development organisations. The internalisation of these strategies and guidelines into a policy programme and action continuum is expected to enhance the integration of women in water and energy management practices.

### **Reduction of health-related hazards from access to energy technologies and less polluting water**

The nature and type of water- and energy-related technologies installed by the women in the project areas are not only based on the actual needs of the women but are also pro-environment and less polluting compared to their predecessors. For example, the ICS is far less smoky than the traditional stoves. With less smoke in the kitchen women have indicated less eye sores, less coughing, and have also indicated that they are able to monitor/teach their children in the kitchen while cooking. Some women indicated that their children were

performing better in school due to their coaching, which was not possible in the past in a smoky kitchen. In Bhutan, women indicated that better water quality has meant a reduced occurrence of water-related diseases. Other factors that have contributed to better health and hygiene relate to an assured supply of water and an improvement in the quality of water (India and Bhutan). Women are better able to plan activities such as washing clothes and bathing their children. Regular washing of clothes and bathing have been made possible through increased or assured supply of water in Bhutan and Indian. In Nepal a sanitation campaign was able to promote the installation of toilets by many households.

### **Contribution to the advancement of women as envisioned by UNEP's commitment to related provisions of Agenda 21, Chapter 24**

Gender mainstreaming of all development work towards sustainable development is possible only if the needs and roles of women in water and energy management are incorporated in development activities in the first place. It is in this context that the contribution of the project to the advancement of women with regard to their participation in ecosystem management and the control of environmental degradation as envisioned by UNEP's commitment to the related provisions of Agenda 21, Chapter 24 needs to be assessed. Taking an intermediate position on two differing gender approaches – efficiency and equity – this project sought to address how the equity approach can build on the successes of the efficiency approach where the implementing agency is really aiming at longer-term empowerment. Recognising that the project to assist women may fail unless men's needs and reservations are also taken into account and dealt with, the project is based on the underlying principle that women are not just different from men in their gender roles, but that they are in a weaker position socially and economically. Women-only projects focusing on women's water and energy needs as an entry point of intervention is thus deemed important to confront their immediate needs, and thus enable women to meet their strategic needs through the empowerment approach until a certain stage or threshold is reached. Beyond this a more holistic gender approach is necessary to sustain the process. As women become more involved, they may become more articulate and experienced: gender sensitive project planning may lead to a greater level of emancipation for women in a more natural way.

The gender-sensitive activities undertaken by the project to empower the women both socially and economically related to the following:

- the primary focus of the project was on women and including their decision making in project planning, designing and implementation;
- the formation of women's groups at each project site;
- the strengthening of women's organisational capacity building through various orientation, training, and awareness-raising activities;
- helping women undertake income-generating activities.

Even in a short period, the project was able to create an institutional space for rural women on which many other programme activities could be uploaded through both horizontal and vertical initiatives. While progress in these aspects varies across the countries involved, the process has started to gain momentum in empowering women.

## **Linking Project Impacts to the Millennium Development Goals**

The project interventions can contribute to meeting a number of the MDG targets at the local level. Although the MDGs have no specific target on energy and only Goals 7 and 4 focus respectively on water and women, not all MDGs can be achieved without focusing on women, water, and energy. Water and energy are two of the most essential resources for human survival and well-being. Women are the primary collectors, users, and managers of water and energy at the household level. Focusing on women's role in and need for these two basic resources can therefore make a significant difference in meeting the MDGs. Box 5.2 provides details of how the impacts of the projects at the micro level are linked to the MDG targets.

### **On Sustainability**

It is too early to judge the long-term sustainability of the programme given its short duration, as many elements of sustainability have yet to surface and may unfold only slowly. However there are some good reasons to believe in the potential for sustainability as the project has created, and the women have consolidated, organisational space by nurturing their social capital, mobilising group savings and a revolving loan fund, and building their organisational capacity. More specifically, the sustainability of the project can be better judged in terms of the following three key areas of concern.

#### **An enabling environment**

The initiatives taken to create an enabling environment for sustainability include analysis of the existing national legislative framework, policies, and gaps in the formulation of guidelines; and the formation of steering committees representing key stakeholders at the central level as well as coordination committees at the district level.

#### **Institutional capacity**

The training of women trainers and trainees and the building of organisational capacity through orientation and awareness and partnership building are some of the key elements for ensuring the sustainability of institutional capacity at the grassroots level. Women participating in the project have gained knowledge through training on technical and institutional aspects and energy- and water-related business development. The trained women are actively engaged in providing information and technical services to the project communities. The necessary institutional support is further guaranteed by the presence of local NGOs, especially at the project sites in India and Nepal. In Bhutan, the formation of a women's welfare association for the operation of the LPG depot and the community development fund, and its linkage with the ICDP programme of RSPN can be instrumental in ensuring institutional sustainability even after the phasing out of the project.

#### **Financial sustainability**

While collaborating partners in each of the countries have developed good linkages and some have received support from different government agencies, the lack of reliable funding after the termination of the pilot project has been a concern. However, the financial sustainability of the project was addressed by establishing a revolving project fund to provide women with access to credit for investing in the procurement of the technologies and to support income-

### Box 5.2: Linking project impacts at the micro level to the MDGs and targets

Goal	Target	Linking Project Impacts to the MDGs
<b>Goal 1: Eradicate extreme poverty and hunger</b>	<p>Target 1: Reduce by half the proportion of people living on less than a dollar a day</p> <p>Target 2: Reduce by half the proportion of people who suffer from hunger</p>	<ul style="list-style-type: none"> <li>• After the adoption of water- and energy-related technologies, women are able to save several hours they spend on collecting water and fuelwood. The time saved is utilised for income-generating activities to increase income and improve family well-being</li> <li>• Use of new technologies improves farm productivity and diversifies rural income</li> <li>• Improved farm productivity enhances household income and nutrition of family members</li> </ul>
<b>Goal 2: Achieve universal primary education</b>	Target 3: Ensure that all boys and girls complete a full course of primary schooling	<ul style="list-style-type: none"> <li>• Access to efficient fuels and technologies frees up children's time, especially girls who are unable to attend school because they are needed to fetch wood, collect water, and undertake other domestic chores</li> <li>• Income generated through use of improved water and energy technologies is used for children's education and well-being</li> <li>• Solar lanterns permit children to study at night in a less smoky environment (due to ICS)</li> </ul>
<b>Goal 3: Promote gender equality and empower women</b>	Target 4: Eliminate gender disparity in education	<ul style="list-style-type: none"> <li>• A decentralised water and energy system reduces the time and burden involved in fetching water and fuelwood, thereby enabling women and girls to use the time saved on education (adult literacy and schooling) and income earning activities (economic empowerment)</li> <li>• Solar lanterns permit women to use time productively even at night</li> <li>• Women's individualised (e.g. adult literacy and training) and collective organisational capacity enhances their self-esteem and self-confidence to address their strategic needs (social empowerment), which in turn has strengthened women's decision-making role at the household and community levels</li> <li>• Mobilisation of financial resources has allowed women to participate in community development activities</li> </ul>
<b>Goal 4: Reduce child mortality</b>	Target 5: Reduce by two-thirds the mortality rate among children under five	<ul style="list-style-type: none"> <li>• Reduction of indoor air pollution and water-borne diseases through the use of smokeless ICS and clean water reduces exposure to diseases and improves child health</li> <li>• Women have more time for child care as they spend less time on water and energy activities</li> <li>• Education helps to increase awareness on health, hygiene, and sanitation issues</li> </ul>
<b>Goal 5: Improve maternal health</b>	Target 6: Reduce by three-quarters the maternal mortality ratio	<ul style="list-style-type: none"> <li>• Reduction of excessive workload and drudgery associated with carrying heavy loads of fuelwood and water have positive implications on women's health</li> <li>• Cooking in a less smoky environment improves women's health and well-being</li> <li>• Empowerment and increased incomes enhance awareness and access to health facilities</li> </ul>
<b>Goal 7: Ensure environmental sustainability</b>	<p>Target 9: Reverse loss of environmental resources</p> <p>Target 10: Reduce by half the proportion of people without sustainable access to safe drinking water</p>	<ul style="list-style-type: none"> <li>• Rainwater harvesting through micro-reservoirs recharges traditional water springs</li> <li>• Plantation ensures slope stability and retards soil erosion</li> <li>• Adoption of social fencing by women to control livestock grazing promotes healthy growth of trees and ground cover and promotes carbon sequestration and other environmental services</li> <li>• Availability of cleaner fuels and energy-efficient technologies reduces demand for fuelwood, increases availability of dung and agricultural wastes for fertiliser, and reduces air pollution and greenhouse gas emissions</li> </ul>

generating activities even after the phasing out of the project. This was further complemented by women's group savings and credit schemes operating at the project sites, and linkages and coordination with different development partners and support agencies.