

# **Integrated Watershed Development: A Success Story from Bundelkhand**

**Supported by  
Sir Dorabji Tata Trust (SDTT)  
and implemented by  
Akhil Bhartiya Samaj Sewa Sansthan (ABSSS)**

**End-of-project report  
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## Preface

Akhil Bhartiya Samaj Sewa Sansthan (ABSSS) is a registered NGO working in Bundelkhand, one of the most backward regions of the country, for the empowerment and development of the most marginalised sections of society, especially tribal groups, dalits and women. Since its inception in 1978, ABSSS has undertaken a variety of programmes under the philosophy of *rachna aur sangarsh*—creation of long-term assets and peaceful struggle for democratic realisation of rights and entitlements.

Initially, ABSSS worked primarily with the Kol community in Patha region of Chitrakoot district of UP Bundelkhand. Originally a forest dwelling tribe, the Kols suffered unspeakable atrocities at the hands of upper-caste landlords (*dadus*) for several generations. The Kols' self-esteem and identity was systematically eroded through social, cultural and economic exploitation. Often in collusion with the local bureaucracy and politicians, local landlords used forcible occupation of land, physical abuse, bonded labour and rape to keep Kols in subjugation. Gaya Prasad Gopal, the founder of ABSSS, set out to change all this in the late 1970s. He set up ABSSS with a few local associates and began to take up issues affecting the Kols. The strategy was of struggle, to voice opposition to exploitation, and move government to action. It led to much success. Around 3000 bonded labourers were identified and released. Criminal action was launched against sexual exploiters. Landless Kols were issued pattas for land. Over 15,000 acres of land was secured and distributed to around 4,000 tribal and dalit families.

Alongside the struggle, ABSSS began constructive work in the Patha region, in the areas of education, health and women's empowerment. ABSSS began to work with dalits and other poor groups in other areas of Bundelkhand as well. Besides working directly in villages, ABSSS nurtured and mentored NGO initiatives by local people from the region, in Banda, Mahoba, Hamirpur and Lalitpur districts.

As poverty is a complex and multifaceted issue that cannot be solved only through a rights-based approach, ABSSS also started to work on livelihood development of marginal and small landholders. ABSSS worked as a Project Facilitation Agency across five districts, under a NABARD watershed development scheme, in association with the UP State Government. Based on that work, ABSSS got the opportunity to implement an integrated watershed development project at two sites, in Chitrakoot and Banda districts, with financial support from SDTT and technical support from Pradan.

This document is an attempt to capture the main facets of the SDTT-supported project that was implemented from 2009 to 2012. As a project of this nature and scope was not implemented before, particularly in UP Bundelkhand, we believe that many of the strategies we adopted and the lessons we learnt will be of great interest to government and non-government agencies focused on sustainable use and management of land and water resources in Bundelkhand.

I would like to take this opportunity to thank the many individuals and agencies that guided us in our efforts and have a lion's share in our success. Shri Deep Joshi of Pradan

reviewed and modified our initial proposal submitted to SDTT and gave it a sharp focus. Dr Bhaskar Mittra and Shri Abhay Gandhe of SDTT followed the project closely and continuously provided invaluable inputs and guidance for better performance. Deenbhandhu Karmarkar and Prabhat Pandey of Pradan provided handholding support and were instrumental in designing and modifying many of the project's initiatives. Other members of Pradan team also visited our sites and shared their expertise. Dr Yashwant Singh of Utthan Samiti, Deoria and Vinod Jain of Trust Consulting, Lucknow, spared their valuable time to serve as project advisors. Randeep Sandhu, consultant, guided us in design and implementation of lift irrigation schemes. Ashok Gopal, consultant, helped us in documentation and analysis of impact. Shree Ramvishal Singh, advisor, National Food Security Mission, Banda, provided his expertise and support for agriculture development. Gopal Bhai, our founder, constantly encouraged us and worked to see that we are aligned to our larger objectives.

That apart, several local and senior government officials and elected representatives visited our project sites and gave us encouragement and support. We are greatly indebted to all these people.

I would also like to use this opportunity to thank the project team that worked tirelessly, and often under very difficult conditions, to make the project a success.

We look forward to your comments and feedback on this publication.

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## Executive Summary

An 'Empowering People through Integrated Watershed Development Programme' was carried by ABSSS, with financial support from SDTT and technical support from Pradan, over a period of four years: 2009-2012.

The project was carried out in two sites of UP Bundelkhand:

- Mangawan in Manikpur block of Chitrakoot district, and
- Baraichha (Chandpura) in Naraini block of Banda district.

While the Mangawan site has a majority population of Kol tribals (who are classified as SC in UP), in Baraichha, the target community was other dalit groups and other poor people.

The Mangawan site is in the 'Patha' plateau, which falls in the agro ecological zone (AEZ) 11 of India, while the Baraichha site is an undulating alluvial tract typical of the Bundelkhand part of AEZ 4.

Though most families in Mangawan site owned agriculture land, and did cultivate it in years of average to good rainfall, the Kols were not truly 'farmers'. Given the soil and water conditions in the area, there was also little incentive to concentrate on agriculture. Before the project, cultivation and production of crops by households was marginal in years of poor rainfall. More intensive agriculture was done in Baraichha watershed area, but much of the land here was eroded and converted into ravines.

The activities proposed and implemented in the two sites were suited to the respective terrains. In the Patha site, more intensive land development was carried out, with both in-situ or on-farm water harvesting (through Pradan's 5% farm pond model and bunding) and ex-situ water harvesting (earthen checkdams), besides development of open wells, lift irrigation and tree plantation. In the relatively flat region in Baraichha, the main activities were land development through leveling and bunding, lift irrigation, and tree plantation. At both locations agriculture development was carried out after creating the infrastructure for soil and water conservation.

The primary project objective was developing micro watersheds with people's participation and sustainable approach, preventing soil erosion and increasing water availability. Towards this end, very satisfactory work was done at both project sites, despite several major obstacles.

As per the project plan reviewed by Deep Joshi of Pradan, the emphasis of the project in the first few years was to be on completing planned treatment works. Emphasis on agriculture development was to be given in the last year of the project. Hence full attention was given to completion of planned and budgeted physical works in the first three years. At the same time, initiatives were undertaken for promotion of new agri practices and new crops, including vegetables. A large-scale farmer training programme

was undertaken in a campaign mode in 2010-11. The agri development initiatives received full attention in 2011-12, through farmer groups.

While on the one hand the project made considerable investments for conserving soil and water resources, persistently low rainfall threatened to negate the potential of project investments. However, despite the severe constraint of low rainfall, beneficiary families took advantage of the various watershed development works undertaken in and around their lands. This was reflected in massive increase in area under cultivation in the main agriculture seasons, rabi and kharif, despite four consecutive years of poor rainfall in the Mangawan site and two consecutive years of poor rainfall in the Baraichha site. A notable result of increased cultivation was reduction in seasonal migration.

Along with increase in area under cultivation, there was significant diversification in choice of crops in the Mangawan site, which had earlier been characterised by cultivation of only three crops—wheat mustard and gram—in only one (rabi) season. There was already much crop diversity in the Baraichha site but due to the project initiatives, more farmers took to vegetable cultivation as a means of enhancing income.

Training and capacity building programmes were conducted in all years, and regular monitoring of impact was done in a very detailed and exhaustive manner.

ABSSS aimed to make the Mangawan watershed a `model' for the region. Hence, maximum efforts were made to get a number of decision-making people from government, civil society and media, to the project site.

Though the project received much accolades from beneficiaries and visitors, there remained some issues of concern. There was considerable variation in yields of crops, and due to rising costs of inputs, many small and marginal farmers found it difficult to get remunerative yields. ABSSS has planned a separate project to plug these gaps in a participatory and systematic manner.

## 1. Project Context

Bundelkhand is one of the most backward and neglected regions of India. The region is characterized by high rural population, degraded natural resources, high rainwater runoff, periodic drought or flood and low agriculture productivity, leading to chronic food insecurity among poor.

In this situation, ABSSS had undertaken some watershed development projects (WDPs) in Chitrakoot and Banda districts of UP Bundelkhand, for integrated natural resource management, for raising agricultural production of marginal and small farmers, most of whom belong to scheduled castes.

One WDP was undertaken and completed with assistance from SDTT, in two locations:

- Mangawan (1100 hectares) in Manikpur block, Chitrakoot district (Patha subregion) and
- Baraichha (1137 hectares) in Naraini block of neighbouring Banda district.

While Mangawan has a majority population of Kols, in Baraichha, the target community was other dalit groups and other poor people.

### ***Physical landscape***

The Mangawan site in Patha plateau falls in the agro ecological zone (AEZ) 11 of India, while the Baraichha site is an undulating alluvial tract typical of the Bundelkhand part of AEZ 4.

The Mangawan watershed is surrounding by hillocks in southern part. Falling within the catchment area of Paisuni River in western side, it consists of irregular uplands with outcrops of rock intermingling with lowlands. The level difference between the ridges and valleys found in the area is 10 m. The general slope is from south to north, varying from 1.0 to 2.5%. The soil is entirely disintegrated sandstone overlying a substratum of rock and is never very deep. This tract was largely under forests, which now stand almost denuded. One river, Kali Barah, passes through the watershed from south to north, and falls into Paisuni River. Another nala named Sarbhanga passes along the boundary of watershed in southern side.

The Baraichha watershed area falls within the catchment area of Ranj River, a tributary of Baghain River which finally joins the Yamuna. The level difference between the ridges and valleys here is 5 m. The general slope of the area is from south to north, varying from 1.0 to 2.0%. The watershed area largely consists of irregular uplands with outcrops of rocks intermingling with mostly lowlands, frequently under water during rainy season. The soil is mostly Mar and Kabar, eroded and converted into ravines. One rivulet (nala) named Gharar passes along boundary of watershed from western- northern side and falls in Ranj River. Another nala named Patihar passes through watershed from southern- northern side and falls in Rang River. Two hamlets, Baraichha and Nedhuwa,

are on the bank of Rang River in west side and Baraichha is on the east side bank. The Gharar Nala and Rang River have perennial flow from south to north.

## **Climate**

Extremes of temperature are experienced in summer and winter in the Mangawan (Patha) area. After February, temperature increases rapidly. In May-June temperature sometimes goes above 45 deg C. After October, both day and night temperatures decrease rapidly till January which is the coldest month, when mean daily minimum is 9.6 deg C and can sometimes drops to about freezing point.

*The Patha region frequently receives extremely poor rainfall.* Table 1 shows rainfall recorded in 2001-11, at a rain gauge maintained by the State Irrigation Department, at a dam site in Patha, not far from Mangawan. Very significant is that fact in 7 of the 11 years, rainfall was below the 400 mm mark, which is generally used to declare an area as drought-prone. Also significant is the fact that from 2007 low rainfall was experienced for five consecutive years.

In the Baraichha site, the normal rainfall is much higher as shown in table 2, which shows data available for 2004-11 from a rain gauge near the site. However, in this site too, low rainfall was experienced in 2009 and 2010.

**Table 1: Rainfall in Mangawan site**

<b>Year</b>	<b>Rainfall (mm)</b>	<b>Max rainfall in a day (mm)</b>	<b>Max rainfall day (s)</b>	<b>Spell (mm)</b>
2001	610	75	July 13	140
2002	425	38	Aug 6	92
2003	445	37	Sept 9 & 10	100
2004	351	30	June 18	85
2005	325	60	July 2	78
2006	506	63	July 25	63
2007	259	45	Feb 2	45
2008	350	40	July 25	108
2009	221	30	July 21	46
2010	210	30	July 15	83
2011	380	50	June 21	82

**Table 2: Rainfall in Baraichha site**

<b>Year</b>	<b>Rainfall (mm)</b>	<b>Max rainfall month</b>
2004	872	June
2005	685	Aug
2006	496	July
2007	341	Aug



2008	884	June
2009	224	Oct
2010	272	Sep
2011	523	Sep

At both sites the onset and withdrawal of monsoons is highly uncertain. Long intermittent dry periods are common as also brief and strong spells of rain. As such both sites prone to drought as well as flooding especially down barren slopes where there is a quick run off.

### **Peoplescape**

The Mangawan site comprised 8 hamlets of 4 gram panchayats. Four hamlets, viz. Mangawan, Chhiwlaha Motwan and Gursarai, fall under Mangawan gram panchayat. Two hamlets—Masnaha and Tikariya—are in Tikariya panchayat and one hamlet each viz., Doda and Bambiha, are from Doda and Bambiha panchayats respectively.

Mangawan is the largest of the 4 gram panchayats and a total of 330 households live in its 4 above-mentioned hamlets. Additionally, the project covered around 270 households living in the 4 hamlets of Tikariya, Doda and Bambiha panchayats.

Mangawan and Tikariya are the largest hamlets and the only ones in project site to be connected by tar road. While Motwan and Chhiwlaha hamlets are adjacent to Mangawan hamlet, Gursarai hamlet is at a considerable distance, in a remote jungle area that was frequently attacked by dacoits in the past and was hence abandoned by households. Tikariya and Masnaha hamlets are adjacent to each other. Doda is a very small Kol hamlet, with less than 20 households.

Around 66% of the households (HHs) covered by the project at Mangawan site are of Kol tribals, classified as SC in Uttar Pradesh (Kols are ST in MP), who are target group of the project. They constitute 90% of the HHs in the 4 hamlets of Mangawan panchayat but in other hamlets, other than Doda, they are in a minority. Of the total HHs covered, 25% belong to General category castes, 6% to OBCs and 3% are Muslims. The breakup of social background of HHs is given in Table 3.

**Table 3: Social structure in Mangawan site**

Village	Households (HHs) by social category				Total HHs
	SC	OBC	Gen	Muslim	
Mangawan (+3 hamlets)	294	6	14	16	330
Bambiha	50	28	82	0	160
Tikariya (+1 hamlet)	37	3	54	0	94
Doda	18	0	0	0	18
<i>Total</i>	<i>399</i>	<i>37</i>	<i>150</i>	<i>16</i>	<i>602</i>

The Baraichha site comprised three villages—Baraichha, Neduha and Chandpura (also known as Chandrapura)—of which one, Baraichha has two hamlets: Chunwapura and

Salmatpur. SC households comprise nearly 30% of the total population and OBCs form 50% (Table 4). Muslims constitute 8% of the population. Salmatpur hamlet is entirely inhabited by Muslim HHs.

**Table 4: Social structure in Baraichha site**

Village	Households (HHs) by social category				Total HHs
	SC	OBC	Gen	Muslim	
Baraichha (+ 2 hamlets)	32	106	8	21	167
Neduha	70	121	23	-	214
Chandpura	59	42	40	22	163
<i>Total</i>	<i>161</i>	<i>269</i>	<i>71</i>	<i>43</i>	<i>544</i>

### **Land use**

As shown in Table 5, the area of watershed demarcated in Mangawan is 1219.15 hectares (ha). A total of 145 ha falls under reserved forest, where no treatment work can be done by an NGO project. Most of the reserved forest land is in Gursarai. Privately owned lands available for treatment account for a total of 1009.75 ha. The Baraichha watershed is slightly smaller but has virtually no reserved forest. Hence the privately owned land is almost the same as in the Mangawan site. Over three-fourths of the watershed areas were targeted for treatment under the project. At each site 500 ha was targeted for intensive in situ treatment.

**Table 5: Land use in Mangawan & Baraichha watershed in ha**

Use	Mangawan	Baraichha	Total
Privately owned agri land	1009.75	995.16	2004.9
Reserved forest	145	.06	145
Land used for other purposes	49.5	58.5	108
Uncultivable wasteland	14.9	22	36.4
<i>Total</i>	<i>1219.15</i>	<i>1075.72</i>	<i>2294.3</i>
Watershed treatment area	813	946.6	1759.6
Area under in situ treatment	500	500	1000

### **Land ownership**

In both sites almost all HHs own land. However, in Mangawan, the project found that around a fifth of the Kol households had pattas allotted by government, but no demarcation had been done. Through the project's efforts, these households could gain possession of land during 2009-2010. Hence, as per last information, in the Mangawan site, there were only 24 HHs with no agricultural land at all—16 of them are Kols. However, the conventional understanding of landlessness is not applicable in the Mangawan site as before the project, a large number of Kol households with land had not cultivated their lands for years. In effect, they too had been landless.

Most land owners have only marginal or small holdings, as evident from Table 6. Many of the holdings are in scattered plots of 0.07 to 0.5 ha each. Land ownership is skewed in favour of upper castes: while Kols constitute 66% of households in the Mangawan site, they own only 43% of the total privately owned land.

**Table 6: Distribution of holdings in Mangawan (total 598 holdings) and Baraichha (total 525 holdings)**

Consolidated size of holding	Holdings (%) in Mangawan	Holdings (%) in Baraichha
< 1 ha (marginal)	50	48
1-2 ha (small)	37	34.1
2-5 ha (semi medium)	10	13.8
5 - 10 ha (medium)	2	4
> 10 ha (large)	1	0.1

### ***Agriculture pattern***

Other than the land owned by upper caste landlords, most lands in Mangawan are characterised by poor quality soil. As per soil testing done in a government lab under the project, the soil has low organic content, low zinc and sulphur, average nitrogen and medium to high potash. In Baraichha the land is relatively more fertile. However, productivity was hampered by undulating terrain. While wheat, mustard and gram were the main rabi crops in both sites before the project, there was considerable crop diversity in kharif in the Baraichha site (Table 7). In Mangawan, there was virtually no kharif cultivation; a small amount of paddy was grown depending on rainfall.

**Table 7: Main pre-project crops in project sites**

Season	Mangawan	Baraichha
Kharif	Paddy	Jowar, arhar, groundnut
Rabi	Wheat, mustard, gram	Wheat, mustard, gram

Though most families owned agriculture land, and did cultivate it in years of average to good rainfall, in the Mangawan site the Kols were not truly 'farmers'. Brought to the Patha several generations ago for cutting forest wood, their involvement with agriculture was limited to cultivation of coarse cereals in clearings. Over the past two generations, there was a clear shift towards growing wheat, and coarse cereals have (unfortunately) gone out of the diet of most Kols. Even so, knowledge about good agriculture practices remained average to poor. In the entire watershed area, there were less than half a dozen Kols who can be considered 'good farmers'. Given the soil and water conditions in the area, there was also little incentive to concentrate on agriculture. As observed by the project, cultivation and production of crops by households was marginal in years of poor rainfall. In 2007-08, less than 5% of land owned by Kols was cultivated in kharif and in rabi only around 20% was cultivated. (Big landlords of upper castes having considerable holdings and resources did of course cultivate a higher proportion of their lands). There

was negligible vegetable production, in monsoon. In Baraichha there was some vegetable cultivation along banks of streams

### ***Biomass***

Pre-project biomass in Mangawan site was restricted to around 800 mature trees on private lands, or less than 1 tree per ha. For meeting fuel wood requirements, poor households exploited denuded jungles, at a distance of 5-10 km from the hamlets. Fodder was scarce and no fodder crop was grown. In Baraichha, the tree population was somewhat higher and many livestock owners were meeting fodder needs through jowar and wheat crop residues.

### ***Livestock***

As per a baseline survey of Mangawan gram panchayat, total livestock owned by 330 households was 1104 animals, of which the majority were cows (435) and goats (269). Most animals were of poor quality. Average production of milch animals was 2 litres/day. Nearly a third of households owned no livestock.

### ***Income***

An intensive survey conducted under the project at the Mangawan site in May-June 2008, with a sample of 77 households (around 10% of total households), showed that even in the best of years, agriculture constituted only around a sixth of total income. The main source of income was wage labour (45% of total income) followed by sale of fuel wood (27%) procured from jungles. The average annual net income of 60% of surveyed households was less than Rs 36,000 and only 9% had income above Rs 60,000—none of these were Kol households. Food accounted for 38%-83% of total expenses of households, with the proportion of expense rising in inverse proportion to total income.

## 2. Project Strategy

The project design followed broadly two strategic strands.

The first strand was that the entire Bundelkhand region calls for integrated development of land and water resources with attendant farming systems. In other words, the land and farming systems must be so developed/ managed that rainwater is used to the maximum extent possible where it falls in the farmers' fields rather than letting it escape as runoff. The bulk of monsoon rains fall in short and intense spells, often separated by several days or weeks, allowing little time for the rainwater to penetrate the soil. Therefore, much of the rainwater runs away and only a fraction is available locally. The approach used in this project was to arrest the rainwater as far as possible close to the plants that needed it, while following a watershed plan. Leveling lands, making field bunds and impounding rainwater in each field were the main techniques used.

Bunding, leveling and terracing are widespread practices in rain-fed regions all over the country – indeed, all over the world – and Bundelkhand is no exception. Unfortunately, farmers in rain-fed regions tend to be poor and do not have the capital to undertake these practices themselves on a large scale. This disability has become more acute over time as land availability per capita has declined, further reducing the ability to accumulate capital. Hence there is need for external funding.

Complementing the *in situ* approach outlined, some larger water impounding structures were planned in the lower reaches, to help capture water seeping through the ground.

The second strand of the strategy was to harness the riverine resources in the region. Little of the available water in the rivers was used before the project. Small lift irrigation schemes, with buried PVC pipes to transport river water to farm fields up to 1500m distance, were chosen as an eminently cost-effective option to harness river waters.

Both the strategies were accompanied by crop diversification and productivity enhancement efforts.

The activities proposed and implemented in the two sites were as per the above two strategic strands and are suited to the respective terrains. In the Patha site, more intensive land development was carried out, with both in-situ or on-farm water harvesting (through Pradan's 5% farm pond model and bunding) and ex-situ water harvesting (earthen checkdams), besides development of open wells, lift irrigation and tree plantation. In the relatively flat region in Baraichha, the main activities were land development through leveling and bunding, lift irrigation, and tree plantation. At both locations, agriculture development was carried out along with capacity building in specific areas. Women's self help groups were formed to initiate the practice of household savings, to build capital for emergencies and farm investment. SHG members were also motivated to do vegetable cultivation in small plots near their homes.

As per approved project plan, a total of 1000 ha was to be covered under land development and in-situ rainwater harvesting and 50 ha was to be covered under land use diversification, including forestation. Importantly, considerable work was to be done through convergence with government agencies and programmes.

### **Objectives**

Under the goal of “Improved food security, sustainability of livelihoods and wellbeing of the poor”, the project had the following objectives:

- Develop micro watersheds with people’s participation and sustainable approach
- Prevent soil erosion & increase water availability
- Preserve and regenerate vegetation
- Develop awareness among people to adopt new agri practices
- Increase agricultural production in a sustainable manner
- Empower women through active participation in decision making process, increase income and access to resources
- Improve socioeconomic conditions food security of the poorest of the poor

### 3. Project Management

The project was implemented by a small team of ABSSS with close consultation and guidance from Pradan, and experts, including members of a specially constituted Project Advisory Committee (PAC).

The project team, apart from part-time director, was as follows:

- Project coordinator (1)
- Engineer (2)
- Agronomist (1)
- Community organiser (4, including one woman)
- Accountant-cashier (2)
- Documentation (1)

Works were executed with locally hired labour according to a quarterly and monthly schedule, based on an annual plan. Progress and quality of work was supervised on a continuous basis, and progress reports are filed weekly. Weekly and fortnightly staff meetings were held to discuss issues of concern. Documentation of number of cultivating households, cultivated area, etc was done as per cropping season. Detailed records were maintained in Excel. Apart from production data, data on inputs and production costs were obtained for different crops from samples of farmers at both sites. Woman community organiser was in bi-weekly contact with women in all hamlets covered by project currently. Monitoring of water levels in sample wells at both sites was done every month.

For facilitating implementation with community involvement, and promoting community-led management of water resources, 5 `sajla samitis' were formed with a total of 51 members, of whom 15 were women and 33 belonged to SC groups. The sajla samitis met almost every week. Apart from this, five water user associations (WUAs) were formed for lift irrigation schemes in Baraichha. The WUAs have a total of 47 members including 9 women and 19 persons from SC groups. A total of 88 WUA meetings were held till March 31, 2012.

On all matters related to land development and in situ rainwater harvesting, regular inputs were received from Dinbandhu Karmarkar of Pradan. On agriculture-related issues, inputs were received from Prabhat Pandey and Dinbandhu Karmarkar of Pradan, PAC member Dr Yashwant Singh and local KVK officials. For lift irrigation, technical guidance was received from Randeep Sadhu. For impact measurement, project received regular guidance as well as analysis and reporting services from Ashok Gopal. SDTT officials Abhay Gandhe and Bhaskar Mitra visited the project sites regularly and gave feedback for improved performance. PAC member Vinod Jain and ABSSS founder Gopalbhai helped project team stay oriented to larger project objectives.

## 4. Project Achievements

As designed with technical assistance from Pradan, the main activity of the SDTT-ABSSS project was development of land and in situ rainwater harvesting, with some ex-situ rainwater harvesting. More focus was on in situ measures, which were allocated 42% of the total budget. Around 16% allocation was for ex situ measures. Secondary aspects of design and implementation were water resource development, land use diversification (forestation), and agriculture development.

Vis-à-vis the two project sites, from implementation perspective, the emphasis was more on Mangawan site, and the aim was to develop it as a `model' for similar efforts in Patha, and other remote, chronically poor regions of Bundelkhand with degraded soils. The project effort at Baraichha was more in the nature of a pilot, for learning and demonstrating cost benefit of developing fertile but undulating ravine land.

Project implementation was done in a phased manner with focus on different sets of activities in each year:

- In Year 1, focus was on detailed planning, community mobilisation, site/beneficiary selection for soil conservation and in situ rainwater harvesting.
- In Year 2, most of the ex-situ and much of the in-site work was completed.
- In Year 3, the focus was on completing in situ work.
- In Year 4, the focus was on building agriculture knowledge.

The following paragraphs provide a summary of the attainments under each objective.

### Developing micro watersheds with people's participation and sustainable approach: preventing soil erosion & increasing water availability

Very satisfactory work was done towards fulfilment of above objectives in both sites. As evident from Table 8, as on March 31, 2012, the total area covered under development of land and in-situ rainwater harvesting measures was 94% of area to be covered by the end of the project (1050 ha).

Work towards realisation of this objective in 2009-10 was greatly hampered at the Baraichha site due to the undulating terrain i.e. ravines, which made levelling through manual labour very difficult. The problem was compounded by non-availability of adequate labour at the site due to the nature of the work (people preferred taking up work in MGNREGA sites). Hence with permission from SDTT `Rajasthani tractors for digging of the earth' along with manual labour were used to do levelling. Subsequently all effort was made to come as close as possible to the target of completing all land development and in situ water harvesting work by the end of March 2011.

Especially due to benefits of bunding and levelling seen despite poor rainfall, the project staff's efforts were matched by people's involvement and cooperation. However, there was a setback due to dacoit attacks in Mangawan site in 2010-11, which led to stoppage



of work for several weeks. As a result, the target of completing all physical works by end of March 2011 could not be achieved. With SDTT permission, the setback was made up with vigorous efforts in 2011-12.

**Table 8: Summary of soil and water conservation, and water-resource development achievement (both sites) with SDTT funds till March 31, 2012**

Programme head	Physical target	SDTT funds sanctioned (Rs)	Physical achievement	SDTT funds spent (Rs)
Land devp. & in-situ water harvesting	1050 ha	10,933,812	986.76 ha	10,934,437
Ex-situ rainwater harvesting	NA	3,466,188	Given in Table 8-A	3,482,425
Water resource development	NA	2,400,000	Given in Table 8-A	2,411,261

**Table 8-A: Activity-wise area/units and beneficiary HHs covered under programme components (both sites)**

Component	Activity	Area/units	No. of beneficiary HHs
Land devp. & in-situ water harvesting	Land bunding	804 ha	678
	Land leveling	104 ha	151
	Earthen gully plugs*	16 ha	15
	Farm ponds*	32 units	51
Ex-situ rainwater harvesting	Checkdam construction*	10 units	89
	Checkdam renovation*	1 unit	25
	Pond renovation*	2 units	8
	Renovation of earthen bunds*	1 unit	2
	Stone gully plug	40 units	24
	Nala excavation*	555 m	9
	Diversion drain*	225 m	NA
	Masonry outlet**	3 units	3
Gabion structures*	3 units	NA	
Water resource development	Well construction	5 units	16
	Well renovation*	2 units	25
	Lift irrigation**	6 units	210

\*Only in Mangawan site \*\* Only in Baraichha site

Table 8-A shows activity-wise area/units and HHs covered under components of land development and in-situ rainwater harvesting, ex-situ rainwater harvesting and water resource development.

Under the head of water resource development, the major achievement was design and execution of lift irrigation schemes in the Baraichha site. Each scheme, constructed at a low cost of Rs around 3.3 lakhs, lifts and transports water for a distance of 500 to 1 km, covering approximately 18.50 ha. Water user associations have been formed to manage distribution of water and recover fees to cover pumping and maintenance costs.

### **Preserving and regenerating vegetation**

Efforts to increase the vegetation, especially tree cover, were limited by distance of project sites from large nurseries. This greatly increased landed cost of saplings. Hence, saplings were obtained from government agencies, and a small nursery at ABSSS head office. Volumes available from these sources were low. A total of 21,086 trees could be planted in Mangawan site, on structures and lands of 166 farmers. In Baraichha, 19,673 trees were planted on structures and lands of 266 farmers. Appropriate local species like amla, neem, mango, subabul, guava, bel, mahua, beheda and karvanda were planted. The overall survival rate was 62.5%. Looking at the overall need for trees at both sites, the plantation activity was much below need.

### **Developing awareness among people to adopt new agri practices**

As per the project plan, emphasis in the first three years was to be on completing planned treatment works. Emphasis on agriculture was to be given in the last part of project period. Nevertheless, considerable effort was undertaken towards promotion of new agri practices in the earlier years.

**Table 9: Number of farmers given input support (both sites)**

Type of input support	No. of farmers supported
PoP inputs for paddy, wheat, gram, mustard cultivation	111
Seeds for green manuring	55
Improved crop-variety seeds	430
Seeds for vegetable cultivation	54

Select farmers were motivated and guided to increase yields, through input support for specific crops and green manuring, as shown in Table 9. Additionally, on-field training with input support was provided to motivate 39 farmers to adopt System of Rice Intensification (SRI) and 22 farmers to adopt System of Wheat Intensification (SWI).

A major activity conducted in 2010-11 was an intensive awareness campaign on good agriculture practices, conducted at both sites before the rabi season. Over 500 farmers were covered and the overall feedback given was that the effort was “highly useful”.

In 2011-12, the effort to agriculture awareness was stepped up through farmer learner groups, formed with the objectives of:

- facilitating learning among farmers through discussion, sharing of information, and knowledge inputs
- encouraging individual and collective reflection on agriculture issues among farmers
- promoting agriculture planning and problem-solving through community forums

As on March 31, 2012, in Mangawan site, 7 farmer groups were active with around 100 members, of whom 10% were women. In Baraichha site also there were 7 active farmer clubs with around 80 members, of whom 14% are women. In the 11 months from inception of this activity in August 2011, the clubs at both sites had a total of over 200 meetings. Meetings guided by Project staff were used to discuss, and share knowledge on a number of topics like crop planning, seed varieties, use of insecticides, benefit of dhaincha cultivation, etc. Meetings were also used to plan for activities like training programmes, tree plantation and making arrangements for timely irrigation.

Apart from all this, training programmes were conducted in each year on specific topics, as indicated in the consolidated listing in Table 10.

**Table 10: Agri training programmes conducted till March 31, 2012**

Topic	No. of participants
Organic fertilisers	30
Improved agriculture practices	37
Agriculture yield trends	12
Kharif crop planning	40

A number of exposure visits were conducted for farmers:

- 29 farmers visited model farms in Sidhpur, Barwara, and lift irrigation project in Sitapur, Chitrakoot district
- 8 farmers visited model farms in Jatara, Tikamgarh district (MP)
- 14 farmers visited model vegetable farms in Naraini, Banda (UP)
- 40 farmers visited Kissan Mahakumbh organised by Agriculture Department, Banda

**Increasing agricultural production in a sustainable manner**

Efforts towards fulfilment of this objective were very satisfactory, though there were five consecutive years of poor rainfall in the Mangawan site and two consecutive years of poor rainfall at Baraichha. Despite this, there was great increase in cultivating households and area under cultivation in both agriculture seasons, at both sites, compared to the pre-project period, as discussed in Impact section of this report. Apart from increased area (discussed in Impact section), there was significant increase in crop diversification including many HHs taking to vegetable cultivation. All this led to higher production and higher income from agriculture compared to the pre-project period and this impact can only be expected to multiply in good rainfall years.

**Empowering women through active participation in decision making process, increasing income and access to resources**

Twenty SHGs with a total of 219 members were formed, as a platform for women to meet and talk about income generating possibilities, as also accumulate savings that could be used for productive or emergency purposes. By March 31, 2012, 18 SHGs had bank accounts. Total saving in bank accounts as on March 31, 2012 was Rs 2.34 lakhs or

around Rs 12,000 per SHG. A total of 106 interloans amounting to Rs 1.26 lakhs were taken by members for purposes such as starting a kirana shop, buying inputs for vegetable cultivation and basket-making, and for meeting marriage expenses. The substantial difference between amount loaned and accumulated savings is due to the fact that there are few viable and low-risk business opportunities at either site. Further, at both sites, the women are more interested in building a cushion against shocks like major illness, or drought, and build savings for major life expenses like marriages of children.

While women were actively consulted in all major project interventions, Kol women in the Mangawan site have become vocal and assertive in expressing community ownership over assets created by the project on common lands. This was clearly seen in the spontaneous action taken by women on November 2009 to prevent farmers outside the watershed area lifting water from a checkdam's reservoir, using large diesel pumps. The women compelled the farmers to shut down the pumps and called for a meeting to decide terms on which outsiders could take water. In September 2010, following a suggestion given by SDTT official Abhay Gandhe, a women's SHG in Mangawan started fish farming in a checkdam reservoir, initially with 22,000 seedlings. Many women have also taken to vegetable cultivation and have expressed keen interest in other income-generating activities.

### **Improving socioeconomic conditions, food security of the poorest of the poor**

Improvement in socio-economic conditions can be seen in a watershed project only after several years of good agriculture production. However, even under condition of persistently low rainfall, improvement of food security of the poorest of the poor was achieved in the Mangawan site, which was marked by chronic food insecurity. Table 11 shows the enormous increases recorded in production of the main cereal and pulses crops. As can be seen production of wheat increased by over four times, production of paddy increased by over eight times and production of gram increased by three times. For the first time, HHs had significant cultivation and production of arhar.

**Table 11: Increase in production of food crops**

Crop	Prod. (kg) in Mangawan site		Prod. (kg) in Baraichha site	
	2007-8	2011-12	2009-10	2011-12
Wheat	112,610	495,750	233,770	405,990
Paddy	6170	52081	0	17010
Jowar*	NA	NA	109,253	170,950
Gram	5620	18,818	86,572	167,935
Arhar*	Negligible	7430	38,795	80,890

\*mix cultivation

In Baraichha agriculture was done quite intensively even before the project but even so significant increase in production is seen compared to 2009-10 when project work started in this site in a big way. While there was 54% increase in production of jowar, which is grown as a mixed crop with arhar, production of wheat increased by 70%. As discussed later in Impact section, another notable achievement in Baraichha was that paddy

cultivation has started for the first time. Production of vegetables at both sites, discussed later, is also noteworthy.

### **Convergence with government**

As mentioned earlier, an important aspect of the project was convergence with government schemes. Around 25% of programme investments were to come from this source. Considerable success was achieved in this respect, especially by leveraging MGNREGA. Sanctions for convergence work amounting to over Rs 1.20 crores were obtained, and till March 31, 2012, Rs 68 lakhs were spent under different activity heads are shown in Table 12.

**Table 12: Expenditure through convergence till March 31, 2012**

<b>Activity</b>	<b>Amount spent (Rs)</b>
Land bunding	1037,940
Land leveling	615,000
Ex situ rainwater harvesting	2,682,540
Lift irrigation scheme	915,162
Forestation	391,454
Demonstration of improved agri techniques	38,960
Purchase of farm machinery for increasing yield (tractor, seed drill, diesel pump, etc)	1,124,600
<b>TOTAL</b>	<b>6,805,656</b>

### ***Capacity building***

Apart from training programmes on good agriculture practices, mentioned earlier, several training and capacity building programmes were conducted on a number of themes as shown in Table 13. In most of these programmes, both staff and community representatives attended as participants.

Other than these structured programmes, capacity-building was done by organising informal consultations/sharing sessions with experts from NABARD, KVK and Agriculture department.

**Table 13: Capacity building programmes (other than agriculture-related programmes)**

<b>Topic</b>	<b>No. of participants</b>
Orientation to watershed development	35
Nursery development	6
Household planning	15
Lift irrigation design and layout	15
Watershed development approach: refresher	15
SHG training	42

SHG bookkeeping	5
SHG strengthening	5
Enabling SHGs to graduate to micro enterprises	2
Financing for producers' company	2
ToT	13
Farmer awareness campaign: orientation and planning	14
Case study presentation	12

### ***Project outputs and dissemination***

As already stated, ABSSS aimed to make the Mangawan watershed a 'model' for the region. Hence, all efforts towards dissemination were directed at getting the maximum number of decision-making people from government, civil society and media, to the project sites.

Thanks to the efforts, the Secretary of the Department of Rural Development, Uttar Pradesh, Manoj Singh, along with top officials like Chief Development Officer (CDO) of Chitrakoot visited the Mangawan site in March 2011. The visitors expressed keen interest in the design of various interventions and appreciated the quality of work done. Also present during this visit were many panchayat secretaries, pradhans and block pramukhs of Chitrakoot district, and BDO, Manikpur.

Other important visitors to project sites were:

- District Collector and Magistrate of Chitrakoot
- Chief development officer (CDO) and project director, DRDA, Banda
- Deputy General Manager, NABARD
- NABARD college staff
- CDO, Chitrakoot
- District Horticulture Officer (DHO)
- Deputy Director-Agriculture
- Soil Conservation Officers
- Executive Engineers- Minor Irrigation, PWD, Power, Jal Nigam, Irrigation dept.
- Divisional Forest Officer (DFO), forest rangers
- teams of 60 MGNREGA APOs and trainers sent through State Institute of Rural Development, UP
- head of KVK, Banda
- Advisor, National Food Security Mission, Naraini (Banda).
- 2-member team of BBC, Lucknow office

ABSSS has always used media to disseminate information on its projects. This project was also extensively covered in local and regional media, especially Hindi newspapers like *Dainik Jagran*, *Amar Ujala*, *Hindustan*, *Aaj* and *Pioneer*. Around 8-10 media reports on the project appeared in each year.

Project document outputs used internally for learning and sharing with project advisory committee members included:

- socio-economic survey of sample HHs in Mangawan site
- comparative data and analysis on area under cultivation, crop choices, yields, cost-benefit of cultivation of different vegetables, impact of SRI use, etc

## 5. Impact

The project had following specific major impacts:

- Increase in number of cultivating households in Mangawan site
- Increase in area under cultivation and production of main crops at both sites
- Increase in crop diversification
- Increase in yields through improved agriculture techniques
- Additional benefits from vegetable cultivation

### **Increase in number of cultivating households in Mangawan site**

As a result of the various works undertaken under the project, a large number of households in Mangawan who had not cultivated their lands for years, returned to agriculture, despite low rainfall. Table 14 shows increase in cultivating households in 4 habitations of Mangawan site for which comparative data is available for the base year, 2007-08. As the table shows the number of HHs cultivating in kharif increased by over 10 times and in rabi the number doubled. At the end of the project, over 95% of the HHs were cultivating even in a below-normal rainfall year, indicating that the project investments are seen as useful for generating food/income and avoiding distress migration.

**Table 14: Increase in cultivating HHs in 4 habitations of Mangawan site**

Village/hamlet	Landowning HHs	HHs cultivating in 2007-8		HHs cultivating in 2011-12	
		Kharif	Rabi	Kharif	Rabi
Mangawan	76	7	31	44	75
Chhivlaha	63	2	36	22	62
Motwan	42	0	28	26	40
Tikariya stn	40	0	13	23	37
<b>TOTAL</b>	<b>221</b>	<b>9</b>	<b>108</b>	<b>115</b>	<b>214</b>

### **Increase in area under cultivation and production of main crops at both sites**

Assets created by the project led to an overall increase in area under cultivation and consequently production in both agriculture seasons in both sites, as shown in table 15. As can be seen, gross area under cultivation increased in Mangawan site by 3 times. In Baraichha, which had fairly intensive cultivation even before the project, there was a significant increase in area under wheat, indicating that farmers want to maximise returns from higher soil moisture conditions. In Mangawan too the greatest increase was in area under wheat. Area under mustard and gram increased by two to two-and-half times.

As can be expected from increased area under cultivation, there was increase in production of main crops compared to the base year. For instance, in Mangawan, wheat production increased 10 times. In Baraichha, wheat production increased by 40%.



Notably, average yield also increased due to improved soil moisture conditions. For example, wheat yield increased from 182kg/bigha to 297kg/bigha. Through adoption of SRI, paddy yield increased over 10 times from 24kg/bigha to 330kg/bigha.

One of the impacts of increased area under cultivation noticed in Baraichha was that a number of HHs that used to migrate routinely for 6 or months stopped doing so. From discussions in villages it emerged that seasonal migration had substantially or totally stopped in 170 HHs (51 in Baraichha, 119 in Nedhua), of whom 78 were SC HHs.

**Table 15: Increase in area under cultivation and production of main crops**

Crop	Mangawan site#				Baraichha site			
	2007-08		2011-12		2009-10		2011-12	
	Area (bighas)	Prod (kg)	Area (bighas)	Prod (kg)	Area (bighas)	Prod (kg)	Area (bighas)	Prod (kg)
Paddy	25	600	116	38,261	0	0	66.75	17,010
Jowar*	0	0	0	0	1541	109,253	1734.5	170,950
Wheat	182	19,910	643	190,920	822	233,770	1230	405,990
Mustard	196	3695	552	53,637	0^	31,732	0^	40,496
Gram	69	2560	170	11,465	1384	86,572	1468.5	167,935
Total	472	26,765	1481	294,283	3747	461,327	4354	802,381

# excluding 4 hamlets for which detailed 2007-08 data is not available

\* cultivated with arhar

^ cultivated with wheat

### **Increase in crop diversification**

Due to concerted efforts made by the project, many HHs in Mangawan site started cultivating alternative crops recommended in consultation with experts, particularly til and barley (table 16). In Baraichha a new crop was added to the already diversified crop basket, with some HHs taking to paddy cultivation. The crop diversification will especially help poor HHs get some returns even in worst possible scenarios such as prolonged dry spell or attack by animals or pests, leading to no chance of getting anything from the main crop.

**Table 16: HHs cultivating alternative crops in Mangawan site**

Alternative Crop	HHs cultivating in 2007-8	HHs cultivating in 2011-12
Til	7	213
Arhar	30	49
Linseed	1	34
Barley	11	110

### **Increase in yields through improved agriculture techniques**

By providing inputs and guidance to selected progressive farmers, the project demonstrated the benefits of using scientific agriculture practices like proper sowing distance, and optimum use of certified seeds and fertilisers in right proportion. Despite poor rainfall farmers following good agriculture practices could get good yields in

comparison to the averages for UP Bundelkhand. Significantly many of these farmers were small or marginal plot holders. For instance, while average yield in UP Bundelkhand (as per *Uttar Pradesh Development Report, Vol II, 2007*, Planning Commission, GOI) of paddy, wheat, mustard and gram is 1067 kg/ha, 1896 kg/ha, 568 kg/ha and 670 kg/ha respectively, in 2010-11:

- Bhailal Jagdeesh of Mangawan owning 0.65 ha got paddy yield of 3010 kg/ha.
- Ramsharn Maiku of Nedhua owning 1.30 ha got wheat yield of 3400 kg/ha.
- Kallu Kunjbihari of Nedhua, and Bhuri Sarju and Baijnath Rameshwar of Chundwapurwa (Baraichha) owning 0.65, 1 and 1.15 ha respectively got wheat yield of 3100 kg/ha.
- Kamrinnisha of Mangawan owning 1.62 ha got mustard yield of 823 kg/ha.
- Lakhnan Sukhnandan and Daduram Rameshwar of Baraichha owning 0.80 and 1.15 ha respectively got gram yield of 1250 kg/ha.

The outputs got by them indicate that with proper crop management (deep ploughing, timely sowing, use of new seeds, proper weeding, etc), project investments can lead to satisfactory production levels even when rainfall is unsatisfactory. Yields obtained from practice of SRI are particularly noteworthy, as shown in table 17.

**Table 17: Top 2011-12 SRI yields in Mangawan**

Farmer	Variety	SRI area (sq m)	Production (kg)	Yield (kg/ha)
Bhailal s/o Badka	N-97	874	511.57	5853.2
Munnu s/o Dadua	N-97	924	537.22	5814.1
Rajaram s/o Balakdas	Pusa Sugandh-5	2160	887.5	4108.8
Rajman s/o Jagdeesh	JR 201	1716	684	3986.0
Ramkisan s/o Pardesi	Pusa Sugandh-5 & N-97	2125	821.25	3864.7
Dude s/o Babulal	N-97	1025	392.7	3831.2
Sawaldas s/o Ramautar	JR 201	1500	571	3806.7

#### **Additional benefits from vegetables**

The project made a concerted effort to promote vegetable cultivation. As a result, nearly 20 HHs in Mangawan and over 30 HHs in Baraichha grew a variety of vegetables for the first time with input and technical support from the project. The results demonstrated to the people that even from small plots one can grow a variety of vegetables to enhance nutritional status of family, and also gain additional income. For example in the Mangawan site, in 2010-11, a woman, Rampyari Bansu, grew 7 vegetables (onion, potato, brinjal, tomato, chilli, spinach, radish) in an area of less than 1500 sq m. Production of onion (450 kg from 300 sq m) and tomato (270 kg from 175 sq m) was

particularly notable. The gross value of her output was over Rs 8,000, which was much more than that obtained from cultivation of any of the conventional crops on equivalent amount of land. Likewise Sankhi Sundar got vegetables worth around Rs 7000 from less than 800 sq m land.

Vegetable cultivation was thus demonstrated as a good source of income, as shown in table 18, which shows gross value of some vegetable production in 2011-12. As the data shows, gross value of vegetables cultivated per HH was nearly Rs 2000.

**Table 18: Gross value from some vegetable production in 2011-12 (both sites)**

Vegetable	No. of cultivating HHs*	Total cultivated area (sqm)	Total production (kg)	Gross value (Rs)
Tomato	23	2324	1941	22,634
Potato^	9	2629	4380	43,800
Onion^	10	2675	2000	12,000
Garlic^	4	117	80	4800
Chillies	17	2437	841	25,235
Bhindi	9	1793	2428	24,280
<b>TOTAL</b>	<b>72</b>	<b>11975</b>	<b>11670</b>	<b>132,749</b>

\*Some HHs cultivate more than one vegetable. ^ Only in Baraichha site

Nevertheless, vegetable cultivation it is not an option for all farmers as only HHs with water harvesting structures close to their lands can meet irrigation needs viably. On area basis, vegetable cultivation requires more investment than food crops, and apart from lacking a capital base, farmers have limited access to affordable credit. Local market for vegetables is limited due to lack of a large urban centre, and possibility of transporting produce to long distance destinations is hampered by lack of infrastructure (cold storage, inadequate transport facilities).

## 6. Program learnings

The following are key findings/learning from the programme:

- Despite consecutive years of extremely low rainfall in Patha, there has been remarkable increase in cultivated area in the project site, indicating that the majority of the HHs are keen on pursuing agriculture as a viable source of income, which enables them to avoid or minimise migration.
- Despite poor rainfall, farmers following good agriculture practices could secure yields equal to or higher than average yields reported for UP Bundelkhand. This is clear evidence of the benefits of soil and water conservation in degraded soils of this region.
- Nevertheless, overall yields are low and as such agriculture is not remunerative for a majority of farmers. While vegetable cultivation is more remunerative, scope for vegetable cultivation is limited by factors like high capital/labour requirement, poor transport infrastructure for daily transport of produce, and distance from large markets/cities.
- Farmers in both sites are keen on increasing yields/returns from agriculture by enhancing their agriculture-related knowledge.
- Apart from trend of poor rainfall, poor knowledge about and access to improved agriculture technologies (improved variety seeds, nutrient use based on soil test reports, etc) are key constraints to increasing yield.
- For reasons stated above, there was need for a 'watershed plus' project after the end of the current project, focussing on plugging agriculture knowledge and technology gaps, through a participatory approach, under an empowerment paradigm.
- There is good scope for converging soil and water conservation work with MGNREGA.

### ***Issues of concern***

Though the project was successful in attaining its main objectives, there remained some issues of concern:

#### **High production costs due to local factors**

As there are very few good-quality draught animals in Mangawan, all farmers at this site use tractors for ploughing, apart from diesel pump sets for irrigation. Both machines have to be hired from a few large farmers of the area, who charge exorbitant and varying rates, as per demand. As a result, expense incurred on ploughing and irrigation is unreasonably high, and affects overall profitability. The problems was partly resolved by obtaining a tractor and diesel pump through convergence (Table 13), but this is not enough to meet the needs of all farmers. SHGs will have to be supported and motivated to raise funds and buy more units of this equipment, which can be given on hire to members at reasonable rates.

### **Knowledge and technology gaps**

Analysis of yield data from project sites across years showed that there was wide variation in yields and a large number farmers were getting less than optimum yields, with the result that while cultivation of food crops partially met food security needs, agriculture was not very cost-effective for them.

At the same time, the project demonstrated that higher yields are possible. Significantly, many of the farmers who got good yields were small and marginal landholders with limited investment capacity. That is, their yields were not related to ability to make high investments in inputs. Through focused group discussions, explanations were sought for each farmer getting high yields, and invariably, participants gave one or more of the following reasons:

- The farmers getting high yields are “knowledgeable” about farming; they know how to do “good farming”.
- The farmers use good amount of fertilisers, including relatively high amount of manure.
- The farmers “take care of their crops better”.

It is thus clear that the yield-gap is a result of a gap in level of agriculture knowledge and management.

While considerable effort was made in the project to fill the knowledge gap, and agriculture education was the major activity for the last year of the project, a more intensive effort needs to be taken, focussing on:

- large number of closely monitored participatory demonstrations of improved seed varieties and agriculture methods
- systematic farmer learning programme for improving yields through good agriculture practices

### ***Recommendations***

Based on lessons learnt from the project, ABSSS suggests that when undertaking or supporting similar projects in areas of Bundelkhand with under-developed agriculture, the development agencies concerned should look at following issues:

- Introducing agriculture education and planning as a major activity from the very start of the project (after the planning phase) through farmer groups/clubs
- Enabling the creation of on-site nurseries at the start of the project, for supply of large volumes of appropriate tree species for forestation/bund plantation
- Grant support for purchase of power tillers/diesel pumps by SHGs/farmers’ groups
- Support for community-managed revolving fund, to enable poor households to access finance at low rate of interest, for purchase of inputs of right quantity and quality
- Creating an institutional setup to manage common watershed assets from the very start of the project, rather than at the end

## About ABSSS

### **Objectives**

- To improve the socio-economic and political conditions of tribal and dalit households with their equitable control over natural resources
- To improve access of tribal and dalit children and youth to basic education and livelihood skills
- To minimize gender inequality and empower women
- To increase access of marginalized rural households to various development and social welfare programs ( in the fields of education, health, social justice, agriculture, housing etc), and their realization of entitlements

### **Major activities and accomplishments**

#### Public policy advocacy

- 15,000 acres of land secured and distributed to 4,000 tribal and dalit families
- 3,000 Kol families have been released from bondage and rehabilitated with the help of the government
- 500 legal cases have been taken up for land entitlement, freedom from bondage, human rights abuse, women's harassment and police atrocities. These cases have resulted in positive judgments and created a sense of security among tribals.
- Effective mobilisation of media for advocacy on local problems at state and national levels
- Successful in policy influence for securing the right to sell non-timber forest products by tribals
- Created unique web portal on Bundelkhand from development perspective ([www.bundelkhandinfo.org](http://www.bundelkhandinfo.org))

#### Women's empowerment

- Successfully addressed the incidence of sexual exploitation and the practice of keeping Kol concubines by landlords by initiating judicial actions.
- Successfully facilitated participation of women from marginalised social groups in local self-governance.

#### Community mobilization and local institutional development

- Facilitated and supported the formation of Patha Kol Vikas Samiti, a registered civil society organisation to address imbalances affecting the lives of tribal in the Patha region.
- Promoted Patha Kol Adhikar Manch, a community based tribal rights forum to act as pressure group by raise voice against violation of human rights, injustice, social discrimination and women's sexual harassment for effective lobbying and policy advocacy.

Promoted chingari sanghatans as village based advocacy bodies in 225 villages of 5 districts of UP Bundelkhand

- Facilitated participation of representatives of marginalised social groups in panchayat raj institutions.

#### Education

- 18,500 tribal children benefited through formal/non-formal education interventions and more than 100 of this target group completed their graduation and post graduation; and
- Pioneer in influencing the education curriculum for adult tribal learners in the backward Patha region.

#### Health

- Promoted use of traditional and alternative systems of medicine by training local healers in use of herbal medicine and acupressure

#### Natural Resource Management

- Water resource development by constructing and renovating 45 ponds, 35 check dams & earthen dams, and farm ponds to irrigate about 3500 hectares of land.
- About 5000 hectares of degraded land made productive under the watershed development initiative, including agriculture development.
- Over 100 drinking water wells and chohras (natural springs) constructed in around tribal hamlets.
- Plantation of several thousand trees.

**Integrated watershed development and livelihood program-ABSSS**  
**Structure wise GPS detail**

S.N.	Name of structure	ELEV	N	E	OTHER
1	Arjun F.P.	932	24,59,530'	080,51,728'	-
2	Arjun(Bade) F.P.	915	24,59,510'	080,51,731'	-
3	Sukhdeiya F.P.	935	24,59,498'	080,51,711'	-
4	Munnilal F.P.	932	24,59,503'	080,51,702'	-
5	Lalawa F.P.	924	24,59,558'	080,51,728'	-
6	Gujratiya F.P.	923	24,59,586'	080,51,793'	-
7	Rajkarayan F.P.	934	24,59,517'	080,51,914'	-
8	Pyarelal F.P.	907	24,59,654'	080,51,935'	-
9	Pappu F.P.	923	24,59,495'	080,52,184'	-
10	Chhoti F.P.	952	24,59,531'	080,52,184'	-
11	Habib F.P.	915	24,59,809'	080,51,822'	-
12	Pale (FP 6) F.P.	905	24,59,939'	080,51,597'	-
13	Tadouki F.P.	969	25,01,036'	080,51,211'	-
14	Jugul F.P.	961	25,01,101'	080,51,182'	-
15	Sitaram F.P.	987	25,01,188'	080,51,055'	-
16	Badri F.P.	980	25,01,285'	080,51,218'	-
17	Munni F.P.	962	25,01,137'	080,51,240'	-
18	Kamata F.P.	926	25,00,715'	080,51,657'	-
19	Shripal F.P.	938	25,00,636'	080,51,738'	-
20	Jaleel F.P.	939	25,00,827'	080,51,572'	-
21	Dude F.P.	924	24,59,752'	080,52,500'	-
22	Dadu F.P.	948	24,59,759'	080,52,376'	-
23	Bhailal F.P.	917	24,59,844'	080,52,402'	-
24	Rajaram F.P.	989	24,59,676'	080,52,349'	-
25	Pappu F.P.	911	24,59,402'	080,52,285'	-
26	Bachhraj F.P.	920	24,59,504'	080,52,605'	-
27	Jagda F.P.	912	24,59,810'	080,52,651'	-
28	Surajbhan F.P.	906	24,59,894'	080,52,475'	-
29	Kodu GP&F.P.	922	24,59,760'	080,51,722'	-
30	Rajia C.D.3	944	24,59,577'	080,51,979'	-
31	WHB 5	917	24,59,883'	080,51,592'	-
32	WHB 6	905	24,59,939'	080,51,484'	-
33	Tadauki GP	977	25,01,019'	080,51,205'	-
34	Gopal GP	930	25,00,577'	080,51,620'	-
35	Bhailal Well	913	24,59,516'	080,51,610'	-
36	Chunaki Well	965	24,59,833'	080,51,755'	-
37	Check Well (Mot)	921	24,59,682'	080,52,942'	-
38	CD-Motwan	853	24,59,681'	080,52,938'	-
39	Bunding-Motwan	921	24,59,519'	080,52,634'	-



40	Bunding -Chhiwlaha	915	24,59,877'	080,52,588'	
41	Bunding -Chhiwlaha	952	24,59,837'	080,52,568'	
42	Bunding khadraha	930	25,00,577'	080,51,620'	
43	Bunding gursayan	946	25,01,119'	080,51,174'	
44	Bunding devigi	934	24,59,517'	080,51,914'	
45	CD 1 (mashnaha)	926	25'00,961'	080,52,725'	
46	CD 2 (mashnaha)	928	25,00,755'	080,52,538'	
47	CD 3( mashnaha)	921	25,00,795'	080,52,491'	
48	Pramod bandhu	938	25,00,964'	080,52,725'	