



**ALLEVIATING
THE SOCIAL VULNERABILITY
OF
TRIBAL FARMERS :
EXPERIENCES OF
TRIBAL SUB-PROJECT
(TSP)**

(UTTAR PRADESH AND UTTARAKHAND)



US GAUTAM, SK DUBEY, ATAR SINGH AND SN YEMUL

Citation:

Gautam, US; SK, Dubey; Atar Singh and SN Yemul. 2017. Alleviating the Social Vulnerability of Tribal farmers: Experiences of Tribal Sub-Project (TSP) from Uttar Pradesh and Uttarakhand. Technical Bulletin, ICAR-ATARI, Kanpur, P:37

Under Guidance of:

Dr. A. K. Singh, DDG (Agril. Exten.), ICAR, New Delhi

Published by:

Director
ICAR-ATARI, Kanpur

Authors:

US Gautam
SK Dubey
Atar Singh
SN Yemul

Technical Assistance:

Ajit Kumar Srivastava,
Manish Kumar Singh,
Avanish Kumar Singh and
Chandan Singh

Year:

2017



Dr. Ashok Kumar Singh

Deputy Director General (AE)
Krishi Anusandhan Bhavan -I
(Indian Council of Agricultural Research)
Pusa, New Delhi-110012

MESSAGE

The potential of farming technologies for transforming the rural livelihood systems has been proved time and again by the frontline extension system of the country. This proposition has still greater validity for the addressing the vulnerability in the tribal social system. As a result, the Indian Council of Agricultural Research is also implementing the Tribal Sub Project (TSP) Scheme across 125 districts of the country by involving the Krishi Vigyan Kendra (KVKs) which also include the 10 districts from Uttar Pradesh (4) and Uttarakhand (6) since the year 2013-14.

The bulletin entitled “**Alleviating Social Vulnerability of Tribal farmers: Experiences of Tribal Sub-Project (TSP) from Uttar Pradesh and Uttarakhand**” is the outcome of three years of consistent efforts of technology demonstrations, capacity building and organizing extension activities in the tribal villages of selected 10 districts of both the states. The experiences confirm the potential of modern technologies for reducing the yield gap and enhancing tribal farmers' net return.

I appreciate the efforts of Dr. US. Gautam, Director, ICAR-ATARI, Kanpur and his dedicated team in coordinating the TSP activities across both the states and compiling the output in the form of this document. I am confident that this document shall be useful for the development personnel, district administrations, extension researchers and state policy institutions in further upscaling the experiences.

(AK SINGH)

PREFACE

The Scheduled Tribe (ST) population of Uttar Pradesh is 107,963 at 2001 census, constituting a meagre 0.1 per cent of the total population (166,197,921) of the State. The decennial growth of ST population has been 42 per cent, which is 16.2 per cent higher than the growth of total population (25.8 per cent) during 1991-2001. The State has a total of five (5) Scheduled Tribes and all of them have been enumerated at 2001 census. The tribal population of the State is predominantly rural with 88.8 per cent of them residing in villages. District wise distribution of ST population shows that Kheri district has the highest proportion of STs (1.2 per cent), followed by Balrampur (1.1 per cent), Shrawasti & Bahraich (each 0.4 per cent) districts. Nine (9) districts, each having a proportion of 0.1 per cent tribal population whereas remaining fifty seven (57) districts have negligible proportion of ST population. The total population of Uttaranchal in 2001 Census has been 8,489,349. Of these, 256,129 persons are Scheduled Tribes (STs) which constitutes 3 per cent of the total population of the state. The state has registered 20.9 per cent decadal growth of ST population in 1991-2001. There are total of five (5) notified STs in the state, and all of them have been enumerated in 2001 Census.

The Tribal Subplan (TSP) Scheme is being implemented across ten (10) selected districts of Uttar Pradesh and Uttarakhand since 2013. The districts Lakhimpur Khiri, Sonbhadra and Balrampur have been chosen from Uttar Pradesh state whereas remaining seven districts namely US Nagar, Chamoli, Pithaoragarh, Dehradun, Haridwar, Almora and Uttarkashi are taken from Uttarakhand state. The reason for selecting these districts was presence of any predominant tribal population in any given area in the districts.

For identifying the gaps, needs and vulnerability points as well as the potential intervention, baseline survey of the villages under these districts were conducted using PRA tools, semi-structured schedule as well as the group discussion and utilizing the secondary data. This helped in understanding the tribal farmers' prevailing practices related to crop, horticulture and animal husbandry. The prevailing migration status of tribal youth and considering farming as the business entity was also attempted to understand. The existing practices were used to ascertain the yield gap among these enterprises in relation to the district yield, state yield as well as the potential yield. Further, the SWOT analysis was also carried out to understand the perceived strength, weaknesses, opportunity and threat of tribal systems with respect to farming. For skill building of the tribals, the perceived training needs in the different areas of agriculture, horticulture and livestock were ascertained and accordingly the need-based and skill oriented capacity building programme were designed and executed.

The results of various interventions were ascertained mainly in terms of yield advantages, yield gap minimized in crop, horticulture and livestock enterprises. During the period of 2013-17 total 1860 on-farm demonstrations were conducted during the above period. Similarly, by conducting 566 training courses, above 7000 tribal farmers were benefitted. Total 141 q of quality seeds were also produced for the tribal villages besides 35000 planting materials like saplings and seedlings were made ready for them. A total of 7000 livestock strains including fingerlings were also produced. Based on the experiences of the project, some pertinent implications for extension systems and policy makers have been suggested.

We hope the book shall be immensely useful for the development personnel, extension administrators, researchers and policy institutions of both the states.

Authors

CONTENTS

Sl. No.	Chapter	Page No
1	Perspectives	01
2	Structural Arrangement for Tribal's Development	03
3	ICAR Initiatives on TSP	05
4	Tribals of Uttar Pradesh and Uttarakhand	06
5	Demographic Highlights of Scheduled Tribes in Uttar Pradesh	11
6	Demographic Highlights of Scheduled Tribes in Uttarakhand	13
7	TSP Schemes implementations by KVKs of Uttar Pradesh and Uttarakhand	15
8	Vulnerabilities in Tribal Livelihood Systems	16
9	Output and Experiences of Interventions	18
10	Successful cases	25
11	Best practices followed	34
12	Technologies for convergence	37

Special Component Plan for Scheduled Castes and Tribal Sub Plan for Scheduled Tribes begin with Sixth Plan (1985-90). The strategy of Tribal Sub Plan (TSP) has been in force since 1974, to ensure adequate flow of plan resources for the development of Scheduled Tribes, while the strategy of Scheduled Castes Sub Plan (SCSP) (earlier known as the Special Component Plan for Scheduled Castes) has been in force since 1979-80, to ensure proportionate flow of plan resources for the development of Scheduled Castes. The current name, i.e., Scheduled Castes Sub Plan has been in force since 2006.

In the mid-1970s, the Special Component Plan and the Tribal Sub Plan were initiated. Tribal Sub Plans and Special Component Plans should be an integral part of Annual Plans as well as Five Year Plans, making provisions therein non-divertible and non-lapsable, with the clear objective of bridging the gap in socio-economic development of the Scheduled Castes and Scheduled Tribes within a period of 10 years." Fresh Guidelines for SCSP and TSP in the Eleventh Five Year Plan were framed by the Planning Commission on the formulation, implementation and monitoring of SCSP and TSP, and issued to 62 Central Ministries/Departments in December, 2006 for the Eleventh Five Year Plan beginning with the Annual Plan 2007-08. The guidelines required the 62 Central Ministries/Departments to a) earmark funds under SCSP and TSP from the plan outlay at least in proportion to the percentage of Scheduled Caste and Scheduled Tribe population in the country, which was 16.2 per cent and 8.2 per cent respectively as per the Census of India 2001. b) place the funds earmarked for SCSP and TSP under a separate Minor Head '789' and '796' to ensure their non-diversion to any other scheme. c) include only those schemes under SCSP and TSP which ensure direct benefits to individuals or families belonging to Scheduled Castes and Scheduled Tribes. d) only include in the SCSP and TSP outlay for area-oriented schemes which directly 5 benefit hamlets/villages which have more than 40 per cent Scheduled Castes and Scheduled Tribes population.

Planning Commission set up a Task Force under the Chairmanship of Narendra Jadhav, Member, Planning Commission, in charge of the Social Sector to review the previous guidelines and its implementation and to make recommendations for the effective implementation of SCSP and TSP. The Narendra Jadhav Task Force made suggestions for improvement. It suggested: a) First, that 25 Ministries/Departments under SCSP and 28 Ministries/Departments under TSP allocate funds in three categories, that is less than 16.2 per cent and 8.2 per cent under SCSP and TSP respectively; which is equal to 16.2 per cent and 8.2 per cent under SCSP and TSP respectively; and more than 16.2 per cent and 8.2 per cent for SCSP and TSP respectively. Ministries which are engaged in regulatory functions, basic scientific research implementation, larger scale infrastructure projects and central organisations without any beneficiary orientations are not obliged to earmark funds under SCSP and TSP. Forty-three ministries and 40 ministries are exempted from SCSP and TSP respectively. b) Second, strict

adherence to Minor head code of 789 and 796 for SCSP and TSP respectively. c) Third, strengthening of administrative arrangements for planning and implementation of SCSP and TSP through setting up of nodal units in all the ministries for SCSP and TSP with requisite full-time staff, and a full-time Joint Secretary to head the SCSP and TSP Unit. d) Fourth, implementation of the non-lapsable feature through setting up Non-Lapsable Central Pool of TSP Funds (NLCPTF) and the Non-Lapsable Central Pool of SCSP Funds (NLCPSF). e) Fifth, additional funding of Rs. 8000 crores to fill the gap for Annual Plan of 2011-12, if the guidelines were strictly adhered to. For the first time, the designated 25 Ministries/Departments for SCSP and 28 Ministries/Departments, including the Ministry of Human Resource Development for TSP have allocated the designated amounts as per the Jadhav Task Force guidelines. Furthermore, on 3 November 2012, the National Advisory Council suggested fresh guidelines for the implementation of the SCSP 7 and TSP, including an institutional framework. In doing this, the National Advisory Council has elaborated clear roles and responsibilities for effective planning, allocation, utilization, monitoring, and transparency in the implementation of SCSP and TSP. This new document is viewed as a paradigm shift from 'accounting' to 'planning' of a special component plan for SCs and STs. These recommendations are referred to while formulating the current guidelines and are annexed in this report for easy reference.





STRUCTURAL ARRANGEMENT FOR TRIBAL'S DEVELOPMENT

Organization

The Ministry of Tribal Affairs is functioning under the overall guidance of the Union Minister of Tribal Affairs and assisted by a Minister of State. The administrative head of Ministry is Secretary who is assisted by two Joint Secretaries, one Deputy Director General and one Economic Advisor. Financial Advisor has been assisting Ministry in the internal finance and budget matters. The chief Controller of Accounts helps in budget/expenditure control. The Ministry is organized into Divisions/ Branches and Sections/ units. The Ministry of Tribal Affairs has a sanctioned strength of 137 employees with a working strength of 101 officials. There are 49 Group A posts, 56 Group B posts (Gazetted/non-Gazetted), 32 Group C posts, which includes 16 formerly Group D posts which have now become Group C posts as per Sixth Central Pay Commissions recommendations.

The Mandate

The Ministry was set up in 1999 after the bifurcation of Ministry of Social Justice and Empowerment with the objective of providing more focused approach on the integrated socio-economic development of the Scheduled Tribes (STs), the most underprivileged of the Indian Society, in a coordinated and planned manner. Before the formation of the Ministry, tribal affairs were handled by different Ministries as follows:

1. As a Division of the Ministry of Home Affairs named as 'Tribal Division' since independence up to September, 1985.
2. Ministry of Welfare: From September 1985 to May 1998.
3. Ministry of Social Justice & Empowerment from May 1998 to September 1999.

The Ministry of Tribal Affairs is the nodal Ministry for overall policy, planning and coordination of programmes for development of ST's. To this end, Ministry of Tribal Affairs has undertaken activities that follow from the subjects allocated under the Government of India (Allocation of Business) Rules, 1961. The subjects allocated to the Ministry of Tribal Affairs are as under:-

1. Social security and social insurance to the Scheduled Tribes;
2. Tribal Welfare: - Tribal welfare planning, project formulation, research, evaluation, statistics and training;
3. Promotion and development of voluntary efforts on tribal welfare;
4. Scheduled Tribes, including scholarship to students belonging to such tribes;
5. Development of Scheduled Tribes
6. All matters including legislation relating to the rights of forest dwelling Scheduled Tribes on forest lands.

Structural Arrangement for Tribal's Development

(Note: The Ministry of Tribal Affairs shall be the nodal Ministry for overall policy, planning and coordination of programmes of development for the Scheduled Tribes. In regard to sectoral programmes and schemes of development of these communities policy, planning, monitoring, evaluation etc. as also their coordination will be the responsibility of the concerned Central Ministries/ Departments, State Governments and Union Territory Administrations. Each Central Ministry/Department will be the nodal Ministry or Department concerning its sector.)

- 7 Scheduled Areas; and regulations framed by the Governors of States for Scheduled Areas; Commission to report on the administration of Scheduled Areas and the welfare of the Scheduled Tribes; and Issue of directions regarding the drawing up and execution of schemes essential for the welfare of the Scheduled Tribes in any State.
- 8 Implementation of the Protection of Civil with a working strength of 101 officials. There are Rights Act, 1955 (22 of 1955) and the Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act, 1989 (33 of 1989), excluding administration of criminal justice in regard to offences in so far as they relate to Scheduled Tribes". 49 Group 'A' posts, 56 Group 'B' posts (Gazetted/ non-Gazetted), 32 Group 'C' posts, which includes 16 formerly Group 'D' posts which have now become Group 'C' posts as per Sixth Central Pay Commission's recommendations.

The Role

The programmes and schemes of the Ministry are intended to support and supplement, through financial assistance, the efforts primarily of other Central Ministries, the State Governments and partly of voluntary organizations, and to fill critical gaps in institutions and programmes taking into account the situation of STs. The primary responsibility for promoting the interests of Scheduled Tribes rests with all the Central Ministries. The Ministry supplements their efforts by way of various developmental interventions in critical sectors through specially tailored schemes. These, comprising schemes for economic, educational and social development and through institution building are administered by the Ministry of Tribal Affairs and implemented mainly through the State Government/ Union Territory Administrations.



3

ICAR INITIATIVES ON TRIBAL SUB PLAN (TSP) PROJECT

Structure

The Inter-Ministerial Committee has taken note of the detailed guidelines relating to the Scheduled Caste Sub Plan (SCSP) for the Scheduled Castes, issued by the Central Government from time to time. The basic objective of the SCSP was to channelize the flow of outlays and benefits from the general sectors in the Plan of States for the development of Scheduled Castes, at least in proportion to their population, both in physical and financial terms. It was, however, observed that several State Governments were not earmarking adequate funds to SCSP with due share of STs and SCs in the population. It was, hence observed forfeited that Scheduled Caste Sub-Plans should be an integral part of Annual Plans as well as Five Year Plans, making provisions therein non-divertible and non-lapsable, with the objective of substantial reduction in poverty and unemployment among SCs and for bridging the gaps in their socio-economic development.

'Way Forward Strategy for XII Plan' on SCSP has proposed a paradigm shift from 'post-facto accounting' to 'pro-active planning' approach with regard the sub plans. The Twelfth Plan proposes a set of key implementation measures to strengthen the SCSP such as - Earmarking of the SCSP funds from the total plan outlays well in advance of the commencement of the financial year, preparation of pro-active planning documents as Sub-Plans, building up an institutional framework to effectively implement these changes etc. The Committee has prepared its report against this backdrop.

A consultation meeting was organised by the Ministry of Social Justice & Empowerment (MSJE) with the States/UTs on the draft SCSP Bill, on 3.7.2013. The Committee feels that it is necessary to ensure the economic, educational and human development as well as the security and social dignity of the Scheduled Castes, achieving equality with the non-Scheduled Caste population in a time bound manner. Earmarking a portion of the total plan outlay of the State Government in proportion to the Scheduled Castes population for SCSP, and 'putting in place an effective institutional mechanism for preparation, implementation and monitoring of the Sub Plans should be an essential component of our policy relating' to the scheduled castes. The strategy to achieve these objectives is proposed in the ensuing paragraphs:

Identification of the target group

The SECC database should be utilized in those States where the data has been published in order to identify the beneficiaries and map the families residing in the States. Therefore, a consolidated database of all the citizens with their general/economic attributes should be readily available with the States. The State government should clearly determine the SC families residing in their domain and assign a unique identity number to the families (same as Aadhaar, where this number has been assigned to the individuals), since government benefits mostly accrue to the families, and not to individuals. This list should be made accessible to all the programme managers/Departments and also the Banks so that they are able to facilitate the social and financial inclusion through their programmes. After identification, the target groups can be linked with the various programmes of the State and Central government that are meant for the SCs. In States where SECC has not been finalized, other criterion to decide the beneficiaries may be used.



4

TRIBALS OF UTTAR PRADESH AND UTTARAKHAND

A. Major tribes of Uttarakhand:

The major tribes of Uttarakhand are Bhotia, Buksa, Jaunsari, Raji and Tharu. The brief descriptions of prominent among them are mentioned as below:

Traditional dance of Buksa tribes

Buksa Tribe: Bhoksa, also known as Buksa, are indigenous peoples living mainly in the Indian states of Uttarakhand. They are mostly concentrated in Dehradun and Nainital districts in the Kumaon foothills of the outer Himalayas. They are also found in the Bijnor district of Uttar Pradesh, where they are known as Mehra. Both communities have been granted Scheduled Tribe status.



Traditional dance of Buksa tribes

The Bhoksa now speak Hindi, and have customs similar to other neighbouring Hindu communities. The Bhoksa still occupy distinct settlements, which they do not share with any tribal or caste grouping. They are now cultivators, with many maintaining their secondary occupation as mountain guides.

The Bhoksa are strictly endogamous, and practice clan exogamy. Their main clans are the Chauhan, Pundir, Tonwar, Chambaval, Kutiyala, Panwar, Phalsane, Katheriya, Tumbewar, Banwarbatti, Lakkiwal, Malanhas, Khasam, Kotwal and Chad. All these clans are of equal status, and intermarry.

As of 2001, the Bhoksa of Uttarakhand were classified as a Scheduled Tribe under the Indian government's reservation program of affirmative action.



Typical Bhotia dress

Bhotia Tribe: The Bhotia or Bhotiya are an occupational caste of shepherds. Numbering around 120,000 people, they live predominantly in the northern states of Sikkim, Tripura, Uttarakhand, Uttar Pradesh, Himachal Pradesh, Jammu & Kashmir, Ladakh, Arunachal Pradesh and West Bengal. The Bhotia people of Uttarakhand once lived on the border of India and Tibet, formerly called the United Province

Typical Bhotia dress during British times. They were nomadic pastoralists and traded wool and salt between Tibet and India. Large numbers of caravans of mules, yaks would travel into Tibet with Indian goods when the snow melted and bartered their goods for local Tibetan merchandise to be sold in India. The Indo-Tibetan border was closed in 1962 and the Bhotia moved across into India.

Tribals of Uttar Pradesh and Uttarakhand

The name Bhotia is derived from the word bhot meaning Buddha. The Bhotia are also called Bhotiya, Butia and Bot.

The Bhotia are shepherds, goat herders and farmers. They card and spin the wool for weavers to make into blankets, shawls and cloth. The women knit jumpers, hats, Jaunsari style of agriculture Traditional Bhotia dance gloves and socks which they sell locally. Some are involved in selling gems (coral & turquoise) and herbs. The Bhotia are a hardy community who live and work in remote inaccessible and very cold regions. Their existence is caught up in the daily struggle of making a living in unstable and difficult conditions. Their needs are for better health, literacy, stability and a reliable source of income.



Traditional Bhotia dance



Jaunsari style of agriculture

Jaunsari Tribe: Jaunsari-Bawar is a hilly region, 85 km from Mussoorie, in Chakrata tehsil, in Dehradun district, it represents the geographical region inhabited by the Jaunsari tribe, which traces its origin from the Pandavas of Mahabharata & Rajputs of Rajasthan. Modes of livelihood in this region are agriculture and animal husbandry, which in the upper region is mostly for self-sustenance, as merely 10 percent of cultivated area is irrigated. Milk, wool and

meat are an integral part of the local economy Jaunsari style of interculturing

The culture of the local Jaunsari tribe is distinct from other hill tribes in Garhwal, Kumaon and Himachal Pradesh, its culture matches with the Trans Sirmaur region i.e. area lying in western side of Giri river, comprises Rajgarh and Shillai tehsils. These people are also known as Hatti, and has similar culture like Jaunsari people.

Most of the Jaunsari are farmers. They cultivate terraces on hillsides which produce only meager crops twice a year. Their principal crops are potatoes and rice, and a variety of other vegetables are also grown. Fertilizer is used, as well as a system of plot rotation in which the ground is allowed to lie fallow. Wet rice is grown during the monsoon season, whereas dry rice, maize, millet, and wheat are raised on the drier land during the summer and winter months. Most of the farmers raise buffalo and goats for meat and cows for milk. The villagers live on a simple diet of milk, lentils, a few vegetables, a little fruit, and occasionally meat. Maize cultivation by Raji tribe



Jaunsari style of interculturing

Tribals of Uttar Pradesh and Uttarakhand

Raji Tribe: The Raji tribe live in the Pithoragarh region of Uttar Pradesh in India. They live in the villages of Jamtadi, Attadi, Bhaktirawa, Ciphalthara, Ganagaon, Khirdwari, Kimkhola, Kuttakanyal and Madanpuri. They are also called Banrawats, The Raji have a strong liking for alcohol. They like wild fruits and tree roots. The Raji women wear large and heavy jewelry that is admired. Not many of the Raji dress in the usual tribal way. They are artistic. Good looking handbags are made that are sold in the markets and in the rest of India.



Maize cultivation by Raji tribe

Most of the Raji live in the interior forest regions. They work as gatherers. They collect honey from bee hives. They work in agriculture and other occupations. They grow cereals and they fish and hunt. They make tools for agriculture. The people and lifestyle of Uttaranchal is determined by the climate as well as the topographical situation of the state. Popularly referred as 'Pahari', which means hill persons, the people of Uttaranchal can be divided into two distinct tribes – Garhwali and Kumaoni. Other tribes that also exist in Uttaranchal are Jadh, Marcha, Tolcha, Shauka, Buksha, Tharu, Jaunsari, Bhotia, Raji and Gujjar.

As far as casteism is concerned the people of Uttaranchal can be divided into Kol-Doms, Khasi Rajput, Khasi Brahmin, immigrant Rajput, migrant Brahmin and Bhotias. The prime occupation of people of Uttaranchal is agriculture. Uttaranchal culture is rich and full of exoticism as well as philanthropy. Take up cultural tours of Uttaranchal to see the myriad land where about 90% of the total population is Hindu.

B. Major Tribes of Uttar Pradesh:

The major tribes of Uttar Pradesh are Gond, Dhuria, Nayak, Ojha, Pathari, Raj Gond (in the districts of Mehrajganj, Sidharth Nagar, Basti, Gorakhpur, Deoria, Mau, Azamgarh, Jonpur, Balia, Gazipur, Varanasi, Mirzapur and Sonbhadra); Kharwar, Khairwar (in the districts of Deoria, Balia, Ghazipur, Varanasi and Sonbhadra); Saharya (in the district of Lalitpur); Parahiya (in the district of Sonbhadra); Baiga (in the district of Sonbhadra); Pankha, Panika (in the districts of Sonbhadra and Mirzapur); Agariya (in the district of Sonbhadra); Patari (in the district of Sonbhadra); Chero (in the districts of Sonbhadra and Varanasi) and Bhuiya, Bhuinya (in the district of Sonbhadra). Some of them are described as below: Rice transplanting by Gond tribe



Rice transplanting by Gond tribe

Gond Tribe: The Gond people are Dravidians people of central India, spread over the states of Madhya Pradesh, eastern Maharashtra (Vidarbha) Chhattisgarh, Uttar Pradesh, Telangana, Andhra Pradesh and Western Odisha. With eleven million people, they are the second largest tribe in Central India. They are a designated Scheduled Tribe in Andhra Pradesh, Uttar Pradesh,

Tribals of Uttar Pradesh and Uttarakhand

Bihar, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, Maharashtra, Telangana, Odisha and West Bengal. The Gond is also known as the Raj Gond. The term was widely used in 1950s, but has now become almost obsolete, probably because of the political eclipse of the Gond Rajas. The Gondi language is Tilling the land by Gond tribe closely related to the Telugu, belonging to the Dravidian family of languages. About half of Gonds speak Gondi languages while the rest speak Indo-Aryan languages including Hindi. According to the 1971 census, their population was 5.1 million. By the 1991 census this had increased to 9.3 million and by 2001 census this was nearly 11 million. The Gonds paint their walls with vibrant depictions of local flora, fauna and gods. Traditionally made on festive occasions, Gond painting depicts various celebrations, rituals and man's relationship with nature. The artists use natural colors derived from charcoal, colored soil, plant sap, leaves, and cow dung. This mystical art form is created by putting together dots and lines.



Tilling the land by Gond tribe

The prime language spoken by Gond Tribe is Gondi. Beside this, the Gond tribes have a good command on Telugu, Hindi, Marathi, Parsi and many other Dravidian languages. In 1928 Munshi Mangal Singh Masaram designed brahmi based script for Gondi, but it is not widely used nowadays. A recently discovered script Gunjala Gondi Lipi is used to write Gondi language. Of late, villagers in Maoist areas are documenting their stories on memorial plaques in this Gond Art form traditional.



Tharu tribal women

Tharu tribe of Lakhimpur District: The Tharu people (Devanagari: Thārū) are an ethnic group indigenous to the Terai, the southern foothills of the Himalayas in Nepal and India. The Tharus are recognized as an official nationality by the Governments of Nepal and India. Tharu Tribe residing in Nainital and Lakhimpur regions is Ranas. They claim themselves to be the descendants of Ranas of Chittor. Dangurias are the dominant group of Gonda and Bahraich regions. The origin of this Tharu tribal community has got

an important history to bank upon. After being thrown from the original homeland, they migrated to several other places including that of the state of Kerala. Traditional households setting of Tharu tribe

Thus as a natural consequence these Tharu tribes were displaced off their fertile lands and started working as bonded laborers in the fields of some of the affluent land employers. Tharu is considered as the biggest, traditional and primitive tribes in Uttar Pradesh.

They produce crops like barley, wheat, maize, and rice. They are also fond of rearing animals. Chickens, ducks, pigs, and goats are some of the common animals



Traditional households setting of Tharu tribe

usually found in almost each and every household of Tharu village. Since several rivers flow through the region many of them have turned into fishermen. They have also adapted to the profession of hawkers. Agriculture is the main occupation of the Tharus. They are also experts in cattle herding, piggery and poultry. They are also engaged in carpentry, masonry, weaving and basketry.

In household, worship of their family deities is observed in quite an elaborate manner. Special rituals are associated with these worships. Animal sacrifices are done by these in order to appease the deity for various reasons like prevention of diseases or occurrence of natural calamities. A popular legend is that deities are being provided with a bhakal, which is promise of something, in lieu of getting assurances of getting the gods protection from various things as has been mentioned just now. Various animals, namely, pigeons and chickens are used for sacrificial purposes. Also milk and beautiful silk clothes are given as offerings. Sacrifices of body parts of human beings like forehead, arms, throat, legs etc are also prevalent. As part of family ritual, Tharu would often use the blood of one of the male members. Special rites are also being observed at the time of death of any of the members of the Tharu family.

In the Tharu society, doctors are known as Shamans. They are also called Guruba. Since the belief is that the diseases can be cured easily if the gods are pleased, the onus of pleasing gods and defeating evils falls on these Shamans who use to beat drums and offer sacrifices. Traditional dressing of Bhuiya tribe

Bhuiya tribe: The Bhuiya tribe is found in the states of Orissa, Bihar, West Bengal, Assam, Uttar Pradesh, Madhya Pradesh, and Tamil Nadu. The main concentration of the tribe is in the former northern princely states of Orissa. The tribe represents various stages of cultural development, ranging from the primitive Hill Bhuiya to the Hindu-influenced Bhuiya landowning sections. The Pauri group is located roughly between 21° and 22° N and 85° and 86° E. Jungle-clad hills and high woodland valleys in the northwest of Keunjhar, northeast of Bonai, and north of the Pal Lahara subdivision in Orissa form their home. The settlements are situated generally on higher elevations at about 600 to 1,050 meters above sea level. The climate is at certain times unhealthy. Lack of roadways has kept most of the inhabited Pauri villages cut off from the outside world. During the monsoon, approach to most of the villages is difficult.



Traditional dressing of Bhuiya tribe

In 1971 the population of the tribe was 1,312,472 (probably an undercount), making it one of the largest tribal groups in the world. The literacy of the tribe as a whole in 1981 was 22.5 percent, but only about 5 percent of the hill group were literate at that time. The economic benefit of education is still not appreciated by that group. Opinions differ about the linguistic affinity of the tribe. The Bhuiya speak an Indo-Aryan language.



5

DEMOGRAPHIC HIGHLIGHTS OF SCHEDULED TRIBES IN UTTAR PRADESH

The Scheduled Tribe (ST) population of Uttar Pradesh is 107,963 at 2001 census, constituting a meager 0.1 per cent of the total population (166,197,921) of the State. The decennial growth of ST population has been 42 per cent, which is 16.2 per cent higher than the growth of total population (25.8 per cent) during 1991-2001. The State has a total of five (5) Scheduled Tribes and all of them have been enumerated at 2001 census.

The tribal population of the State is predominantly rural with 88.8 per cent of them residing in villages. District wise distribution of ST population shows that Kheri district has the highest proportion of STs (1.2 per cent), followed by Balrampur (1.1 per cent), Shrawasti & Bahraich (each 0.4 per cent) districts. Nine (9) districts, each having a proportion of 0.1 per cent tribal population whereas remaining fifty seven (57) districts have negligible proportion of ST population.

Population - Size & Distribution: Out of five STs, Tharu is the most populous tribe, having a population of 83,544; they constitute 77.4 per cent of the total tribal population of the State. Buksa is the second major tribe, having a number of 4,367, followed by Bhotia, Jaunsari and Raji. These four tribes along with generic tribes constitute the balance 22.6 per cent of total ST population.

At the level of individual tribe, Tharu are primarily concentrated in Kheri, Balrampur and Bahraich districts. Buksa have the highest concentration in Bijnor, followed by Farrukhabad districts. Other three STs, Bhotia, Jaunsari and Raji have returned maximum population in Agra, Kheri and Gorakhpur districts respectively. 5. Among the five STs, Buksa and Raji tribes have been recognized as Primitive Tribes. Together, they constitute 5 per cent of the total tribal population of the State.

Sex Ratio: The overall sex ratio of the ST population is 934 females per 1000 males which is lower than the national average (978) for all STs. Individually, all the five tribes have recorded an overall sex ratio lower than the national average. While Tharu, Bhotia and Buksa have sex ratio above 900, Raji and Jaunsari have the sex ratio below 900 and 800 respectively. The sex ratio among STs, in the age group 0-6 years (973) is equal to that of all STs at the national level. Tharu have recorded the child sex ratio marginally lower than the national average whereas remaining four tribes have registered child sex ratio above 1000, showing a preponderance of girl children.

Literacy & Educational Level: The overall literacy rate of the STs has increased from 20 per cent at 1991 census to 35.1 per cent at 2001 census. Despite improvement, the literacy rate of STs is considerably lower than the national average of 47.1 per cent aggregated for all STs. Male and female literacy rates (48.4 per cent and 20.7 per cent) are also considerably lower in comparison to those recorded for all STs (59.2 per cent & 34.8 per cent) at the national level. Among the five STs, only Jaunsari have shown the overall literacy rate (51.1 per cent), higher than that of the national average. All the five STs have shown female literacy lower than the national average (34.8 per cent). Among tribal literates, 45.2 are either without any educational level or have attained education below primary level. The proportions of literates who have attained education up to primary and middle levels are 25.2 per cent and 16 per cent respectively. Persons educated up to matric / higher secondary / Intermediate constitute 10.8 per cent. Graduates and above are 2.8 per cent. Among all the STs, Raji have the highest proportion of secondary level literates, followed by Bhotia and Jaunsari. Bhotia have

shown the highest proportion graduates followed by Raji. The percentage of the tribal literates decline sharply from the secondary level onwards. Out of total 31,994 ST children in the age group 5-14 years, 12,889 children have been attending school, constituting 40.3 per cent only. As many as 19,105 children in the corresponding age group have not been going to school. Jaunsari have more than half of the total children in the above mentioned age group are school going; this proportion is below 50 per cent among Tharu and Buksa.

Work Participation Rate (WPR): The Work Participation Rate (WPR) of the ST population is 40.3 per cent which is lower than that of all STs at the national level (49.1 per cent). There has been a slight increase of 2.4 per cent in the over all WPR of STs during 1991-2001. Male and female WPR (49.9 per cent & 30.1 per cent respectively) are lower than those of the national average. Among the total workers, 66.6 per cent are main workers and this proportion is marginally lower than the national average (68.9 per cent). At the individual level, Buksa, Jaunsari and Bhotia have overall WPR lower than the State average. Except Raji and Tharu, other three tribes have female WPR lower than that of the State.

Category of Workers: 'Cultivators' constitute the highest proportion (44.6 per cent) among the total tribal workers, which is equal to that of all STs at the national level (44.7 per cent). 'Agricultural Labourers' account for 31.4 per cent, which is lower than the national average of 36.9 per cent recorded by all STs in this category. 'Other Workers' form 21.6 per cent which is higher than the national average of 16.3 per cent. Workers engaged in 'Household Industry' (HHI) constitute 2.4 per cent which is same as that of the national level (2.1 per cent). At the individual level, Tharu have more than fifty per cent workers are 'Cultivators'. Buksa have the highest proportion of 'Agricultural Labourers' (42.3 per cent) whereas more than 70 per cent of Bhotia workers are 'Other Workers'. Among all tribes, Raji have the highest proportion of 'HHI' workers followed by Bhotia and Buska.

Marital Status: The data on marital status show that more than half of the ST population is 'never married' (53.6 per cent) whereas 'married' persons constitute 43.6 per cent. 'Widowed' persons form 2.7 per cent while a negligible 0.1 per cent is 'divorced and separated'. The proportion of married girls below 18 years (2.9 per cent) is slightly higher than that of all STs at the national (2.1 per cent) whereas married boys below 21 years constitute 5.4 per cent which is considerably higher than the national average of 2.8 per cent. Among all tribes, Jaunsari and Bhotia have registered the proportion of married girls below the stipulated age higher than that of the State. On the other hand, Raji and Tharu have shown the proportion of married boys below legal age higher than the State average. The mean number of children ever born per ever married ST woman (45 - 49 yrs.) is 5, which is higher than the all STs at national level (4).

Religion: Hinduism is the predominant religion of the tribes of the State (80.6 per cent). The STs professing Hinduism account for 98.5 per cent. Muslim tribes constitute 0.9 per cent. Tribes following Christianity (0.3 per cent), Sikhism and Buddhism (each 0.1 per cent) together constitute half per cent only.



6

DEMOGRAPHIC HIGHLIGHTS OF SCHEDULED TRIBES IN UTTARAKHAND

The total population of Uttaranchal in 2001 Census has been 8,489,349. Of these, 256,129 persons are Scheduled Tribes (STs) which constitutes 3 per cent of the total population of the state. The state has registered 20.9 per cent decadal growth of ST population in 1991-2001. There are total of five (5) notified STs in the state, and all of them have been enumerated in 2001 Census.

Population-Size and distribution: Tharu is the largest of the five STs of Uttaranchal. They account for 33.4 per cent ST population of the state, followed by Jannasari (32.5 per cent), Buksa (18.3 per cent), and Bhotia (14.2 per cent). Raji is small in number. The STs in Uttaranchal are predominantly living in rural areas with 93.8 per cent rural and only 6.2 per cent urban. Bhotia have recorded a high of 25.8 per cent urban population among them. Raji with 8.9 per cent urban dwellers among them come next. On the other hand Buksa and Tharu are predominantly living in rural areas with only 0.8 per cent and 1.9 per cent urban population respectively. A majority of the ST population is concentrated in four districts, namely, Udham Singh Nagar (43 per cent), Dehradun (38.8 per cent), Pithoragarh (7.5 per cent), and Chamoli (4.1 per cent).

Sex Ratio: The overall sex ratio among the STs is 950, which is below the aggregated national figure for STs (978). Bhotia (1049) have registered more females in their population. On the other hand very low sex ratio of 833 has been recorded among Raji. The child sex ratio (0-6 age group) of 955 among the STs is also low as compared to the national average (973) for STs. The Raji also have registered low child sex ratio (757).

Literacy & Educational Level: Among STs, 63.2 per cent of the population has been recorded as literate, which is well above the national average (47.1 per cent). The male and female literacy rate of 76.4 per cent and 49.4 per cent respectively suggest for wider gender gap in literacy. Bhotia with 79.9 per cent literacy rate are well ahead of other STs. The female literacy rate (69.1 per cent) among Bhotia is also the highest among the five STs of the state. Raji have recorded the lowest literacy rate of just 35.8 per cent. 76.6 per cent of the ST population of age group 5-14 years has been attending educational institutions. Bhotia have recorded the highest percentage (86.4 per cent) of school attending population, closely followed by Tharu (82.3 per cent). On the other hand Raji have recorded the lowest of 50 per cent. The Jannasari (75.1 per cent) and Buksa (63.7 per cent), the remaining two STs, also have recorded below the state average. Merely 4.3 per cent of total literates among STs are having educational level graduate and above. Bhotia with 11.6 per cent of their literate population as graduate or having higher level of education are on the top among STs. On the other hand Buksa have recorded a low of just 0.7 per cent.

Work Participation Rate (WPR): In 2001 Census, 41.1 per cent of the STs have been recorded as workers, which is below the aggregated national level for STs (49.1 per cent). Of the total workers 73.1 per cent have been recorded as main workers and 26.9 per cent as marginal workers. The

Demographic Highlights of Scheduled Tribes in Uttarakhand

female WPR of 31.9 per cent is just lower than male (49.9 per cent), while it is lowest among Buksa (34.9 per cent).

Category of Workers: Industrial category wise of the total ST main workers, a high of 67.9 per cent has been recorded as cultivators, 7.7 per cent as agricultural laborers, 5.2 per cent in the category of household industry, and the remaining 19.2 per cent as 'other workers'. Jannsari and Tharu are predominantly cultivators. Of their total main workers, 80.6 per cent among Jannsari and 78.5 per cent among Tharu have been recorded as cultivators. Buksa have recorded 54.1 per cent of their main workers as cultivators. However, a high of 28.3 per cent as agricultural labourers among recorded among Buksa speaks for their greater dependency on primary agricultural sector.

Marital Status: As regard marital status, 53.8 per cent of the ST population is never married, 41.9 per cent currently married, 4.1 per cent widowed, and 0.2 per cent divorced /separated. The child marriage is not common among the STs of Uttaranchal. Merely 1.9 per cent of total female population among STs of below 18 years – the minimum legal age for marriage – has been recorded as ever married. Raji have recorded the highest percentage of marriage below the stipulated age (3.9 per cent), while the same is the lowest among Buksa (0.8 per cent). 16. The ever married males below 21 years – the minimum legal age for marriage – constitute 2.7 per cent of the total population. Tharu have recorded the highest 3.4 per cent of their population of this stipulated age as ever married, closely followed by Jannsari (3.1 per cent).

Religion: The STs in Uttaranchal are predominantly Hindus constituting 99.1 per cent of the population. Besides, a total of 1,344 persons have been returned as Budhists.



7

TSP SCHEMES IMPLEMENTATIONS BY KVKs OF UTTAR PRADESH AND UTTARAKHAND

The Tribal Subplan (TSP) Scheme is being implemented across ten (10) selected districts of Uttar Pradesh and Uttarakhand since 2013. The districts Lakhimpur Khiri, Sonbhadra and Balrampur have been chosen from Uttar Pradesh state whereas remaining seven districts namely US Nagar, Chamoli, Pithaoragarh, Dehradun, Haridwar, Almora and Uttarkashi are taken from Uttarakhand state. The reason for selecting these districts was presence of any predominant tribal population in any given area in the districts.

For identifying the gaps, needs and vulnerability points as well as the potential intervention, baseline survey of the villages under these districts were conducted using PRS tools, semi-structured schedule as well as the group discussion and utilizing the secondary data. This helped in understanding the tribal farmers' prevailing practices related to crop, horticulture and animal husbandry. The prevailing migration status of tribal youth and considering farming as the business entity was also attempted to understand. The existing practices were used to ascertain the yield gap among these enterprises in relation to the district yield, state yield as well as the potential yield. Further, the SWOT analysis was also carried out to understand the perceived strength, weaknesses, opportunity and threat of tribal systems with respect to farming. For skill building of the tribals, the perceived training needs in the different areas of agriculture, horticulture and livestock were ascertained and accordingly the need-based and skill oriented capacity building programme were designed and executed.

The results of various interventions were ascertained mainly in terms of yield advantages, yield gap minimized in crop, horticulture and livestock enterprises. Also, the effect of capacity building programme was ascertained in terms of gain in knowledge and awareness created. Based on the experiences of the project, some pertinent implications for extension systems and policy makers have been suggested.



8

VULNERABILITIES IN TRIBAL LIVELIHOOD SYSTEMS

In order to identify the vulnerability of the tribal population of Uttar Pradesh and Uttarakhand, participatory discussion was made with tribal groups of both the states. SWOT analysis was carried out to delineate their view points.

Major perceived Strength: With respect to their prevailing social and family system, tribals felt their Joint family system and community based style of living is the main strength. They also perceived them as the very much laborious and Honest. More number of available manpower and their receptivity for new learning is also felt by them as their strength. Many of the tribal villages were having well connected roads and their fields were well labelled which according them are the strength for development of agriculture. It was also revealed by them the prevailing bio-physical climate is suitable for all kind of enterprises like Agri-silvi- AH integrated farming system, suitable for temperate fruit crops like Apple, Peach, Plum, etc. and better chances of success of sheep and goat rearing for additional income source.

Perceived major Weakness: The major weaknesses of tribals as identified by them were the remoteness of their locations and as a result they have developed the tendency to avoid to connect with other community and thus dwells in poor socio-economic conditions. This has further aggravated by their Poor literacy rate as indicated in population census data also. Regarding farming, they are facing multi-pronged challenges. These include their small land holding, Poor Fertility of Land, rainfed farming especially in hills, presence of non-descript cattle and poultry, lesser use of production inputs and quality planting materials, poor technical know-how. Also, they felt that tribals have been isolated from the development institution networks. Poor market facility was another points of their concern. It was realized by the tribal groups that increasing alcohol consumption is the major weakness among them.

Perceived major Opportunities: The tribals were asked to identify the major opportunities in farming in their respective areas. Varieties of potential opportunities were expressed by them. With respect to crop enterprises, it was felt by them that cereals including maize and bajra have the tremendous scope. Similarly, pulses and oilseeds are the areas which may help them to earn more from their small holding. Likewise, promoting the off-season vegetables are another area of their opportunity. As the tribals have the strength of forest areas in their surrounding especially in Uttarakhand hills, it was expressed by them that forest nursery raising, promoting the forest based enterprises like sericulture, lac cultivation, donna and pattal making may be promoted to reduce the social vulnerability of the tribals. Similarly, in backyard poultry and goat farming they see tremendous opportunities for enhancing employment and income among the tribals. With particular reference to the hills of Uttarakhand, tribals farmers expressed that the large scale cultivation and promotion of local razmas is required. Similarly, they also expressed that their knowledge empowerment in the modern area of agri-techniques are the opportunities for them.

Perceived major threats: From farming perspectives, tribal noticed several threats which may distract them from agriculture in years to come. Reducing soil fertility due to erosion owing fast felling of forest trees and depleting water table coupled with less and erratic pattern of rainfall are the serious threats. Presences of wild animals like blue bulls, wild pigs, etc have become menace for the crops. From hills region, tribal farmers held the view that heavy snowfall in winter, failure of transportation and communication in rainy season adding to the woes and practice of one-season and one-crop in hills are becoming the potential threats. Fluctuating market price of agricultural produce and at the same time non-availability of assured market are perceived threats for farming. Tribal farmers also felt that Government policy and practices are not visible at the ground level and still tribals are feeling themselves isolated from mainstream.

Major vulnerabilities: In relation to farming, tribal are mostly vulnerable to high yield gap in crops, livestock and the related enterprises. This may be mostly attributed to their poor use of new technologies of agriculture. Not only this, tribal farmers also have poor knowledge of do-how of the technologies. Therefore, poor skills of technology use are another vulnerability point. From employment point of views, non-availability of round the year employment opportunity in farming is also causing seasonal migration as well as permanent migration to city in search of regular income. In order to address the issue of social and technological vulnerabilities in tribal setting, it has been felt appropriate to intervene through demonstrations of high yield varieties, related technologies and packages of practices; capacity building of tribal farmers about the right use of the technology in the correct way; introduction income and employment generating interventions among them and

Tribal's perception of potential interventions for their upliftment:

1. Improving their skills in farming for use of latest technology of agriculture & other enterprises for employment generation and productivity enhancement.
2. Need for Identifying their role related to forest work and its conservation
3. Conserving and protecting indigenous technical knowledge (ITK) of Agriculture, livestock & medicinal plants.
4. Holding regular awareness campaign in respect of literacy aspects, health & standard of living.
5. Government policies must be Planned and implemented at grass root level



9

OUTPUT AND EXPERIENCES OF INTERVENTIONS

9.1 Details of tribal farmer-centered on-farm activities conducted

As the project on TSP was under operation in the 10 districts of the states of Uttar Pradesh (4) and Uttarakhand (6) since the year 2013-14, the details of the activities undertaken are furnished here as under Table 1. As indicated in the Table 1, it is evident that total 1860 on-farm demonstrations were conducted during the above period. Similarly, by conducting 566 training courses, above 7000 tribal farmers were benefitted. Total 141 q of quality seeds were also produced for the tribal villages besides 35000 planting materials like saplings and seedlings were made ready for them. A total of 7000 livestock strains including fingerlings were also produced.

Table 1: Details of tribal farmers' centered on-farm activities conducted in the project villages

Particular	2013-14	2014-15	2015-16	2016-17	Total
On-farm trials and demonstrations (Number)	464	631	365	400	1860
Farmer rural youth's and extension personnel trained (Number)	1390 (125)	1533 (124)	1900 (142)	2200 (175)	7023 (566)
Production of Seed (in tonnes)	0	1.6	60	80	141.6
Production of planting material (in lakh)	0	0	15000	20000	35000
Live-stock strains and fingerlings (in lakh)	0	700	0	0	700

9.1 Details of Productivity Demonstrations conducted for different enterprises

9.1.1 Field crops

Total of 2432 tribal farmers from total of 15 villages spread across the selected ten districts of UP and Uttarakhand were addressed during the year 2013-14 to 2016-17 covering 826 ha of area under productivity demonstrations of field crops like cereals (wheat, rice), pulses (lentil, chickpea, pigeonpea), oilseeds (mustard, sesame) and commercial crops (sugarcane) (Table 2). The yield advantages ranged from 40-108% farmers' varieties.

Table 2: Details of productivity demonstration Conducted in field Crop.

Sl. No	Crop (variety)	Area Covered (ha)	No. of farmers Covered	No. of Village Covered
1.	Wheat	36	272	15
2.	Lentil	46	214	12
3.	Oyster Mushroom	455 Bag	140	08
4.	Sugarcane	152	175	10
5.	Sesame	50	188	09
6.	Green gram	38	125	12
7.	Rice	72	250	18
8.	French bean	80	158	08
9.	Pigeon Pea	43	145	11
10	Hybrid Maize	53	165	12
12.	Mustard	90	200	18
13.	Chick Pea	82	145	13
14.	Field Pea	82	155	11
Total		826	2432	8-15 villages

9.1.2 Horticultural crops

Under horticultural crops, 405 tribal farmers from 12 villages were covered for which the vegetable crop varieties of vegetable pea. Onion, tomato, capsicum, cabbage, okra, brinjal were demonstrated in the area of 49 ha for raising the productivity. The yield advantages ranged from 25-45% over local (Table 3).

For field crops, the yield gap was minimized to the extent of 25% to as high as 200%. Similarly, for vegetable crops, yield gap was minimized to the extent of 56%.

Table 3: Details of productivity demonstration Conducted in Horticultural Crops.

Sl. No	Crop (variety)	Area Covered (ha)	No. of farmers Covered	No. of Village Covered
1.	Vegetable Pea	10	70	05
2.	Onion	03	40	06
3.	Tomato	07	80	04
4.	Capsicum	05	60	08
5.	Cabbage	04	50	09
6.	Okra	09	45	11
7.	Brinjal	11	60	12
Total		49	405	4-12 villages

9.1.2 Livestock enterprises

For livestock enterprises, backyard poultry and goat rearing was most preferred enterprises by the tribal farmers. The improved breeds of these helped them to enhance their farm and household income. From 6 villages, 75 tribal farmers were benefitted (Table 4).

Table 4: Details of productivity demonstration conducted in animal enterprises.

Sl. No	Animal types	No. of animals/birds Covered (ha)	No. of farmers Covered	No. of Village Covered
1.	Backyard Poultry	200 chicks	40	06
2.	Goat	40 kids	35	04
Total			75	4-6

9.2 Output of different enterprises demonstrated

9.2.1 Crop enterprise

In Table 5, the yield advantages due to demonstrations of improved technologies (varieties and practices) in crop enterprise have been presented.

Table 5: Productivity advantages in crop enterprises demonstration

Sl. No	Crop	Existing yield (q/ha)	Demo .Yield (q/ha)			Yield Advantage	
			Max.	Min.	Av.	Absolute (q/ha)	%
1.	Wheat	10.00 q/ha	16.4	12.8	13.4	03.40	025.37
2.	Lentil	5.00 q/ha	9.2	5.1	7.6	02.60	034.21
3.	Oyster Mushroom	New Introduction	2.90 kg/bag	1.90 kg/bag	2.41	02.41	100.00
4.	Sugarcane	310.00	820	540	680	370.0	054.41
5.	Sesame	01.01	6.50	3.43	4.57	03.56	077.89
6.	Green gram	02.50	7.50	3.40	5.42	02.92	053.87
7.	Rice	09.50	32.81	11.50	22.74	13.24	058.22
8.	French bean	80.50	115.50	99.50	105.50	25.00	023.76
9.	Pigeon Pea	04.00	14.00	06.00	10.00	06.00	060.00
10	Maize	07.00	14.80	03.50	09.50	02.50	026.32
12.	Mustard	09.00	16.25	08.49	12.35	03.35	027.19
13.	Chick Pea	04.00	18.00	09.65	13.35	09.35	070.03
14.	Field Pea	06.00	20.00	11.25	15.37	09.37	060.96

It was found that there was considerable yield advantage for rice (58.22%), maize (26.00%) and wheat (25.37%); pulses like lentil (34.21%), green gram (53.87%), pigeonpea (60.00%), chickpea (70.03%) and field pea (60.96); oilseeds like sesame (77.89%) and mustard (27.19%). The yield advantages in vegetables were also encouraging as in the case for french bean (23.76%). Commercial crop like sugarcane also registered higher yield advantages to the extent of 54.41 per cent. There was 100% yield advantage for the newly introduced employment generating

It was found that there was considerable yield advantage for rice (58.22%), maize (26.00%) and wheat (25.37%); pulses like lentil (34.21%), green gram (53.87%), pigeonpea (60.00%), chickpea (70.03%) and field pea (60.96); oilseeds like sesame (77.89%) and mustard (27.19%). The yield advantages in vegetables were also encouraging as in the case for french bean (23.76%). Commercial crop like sugarcane also registered higher yield advantages to the extent of 54.41 per cent. There was 100% yield advantage for the newly introduced employment generating option like oyster mushroom cultivation among the tribal settings (Table 5).

Similarly, the profitability was also worked out for various crops in which the technologies (improved seeds and practices) were demonstrated.

Table 6: Profitability advantages in selected crop enterprises demonstration

Sl. No	Crop	Cost of production (Rs/ha)		Gross Return (Rs/ha)		Net Return (Rs/ha)		B:C ratio	
		Farmer variety	Improve Variety	Farmer variety	Improve Variety	F V	I V	F V	I V
1.	Wheat	13150	14300	18372	32225	05222	17925	1.39	2.25
2.	Lentil	07540	09200	26600	37330	19060	28130	3.52	4.05
5.	Sesame	08000	09600	12300	27440	04300	17800	1.53	2.85
6.	Green gram	09750	12500	13900	29100	04150	16600	1.42	2.38
7.	Rice	10200	12350	14800	26962	04600	14612	1.45	2.18
8.	French bean	34450	36900	120750	160950	86300	124050	3.50	4.36
9.	Pigeon Pea	12400	13670	40960	53020	28560	42350	3.30	3.87
12.	Mustard	10255	10500	45500	57200	35245	46700	4.43	5.44
13.	Chick Pea	12500	13250	34800	49010	22300	35760	2.78	3.69
14.	Field Pea	34250	32430	71380	83560	37130	51130	2.19	2.57

As indicated above in Table 6, among the cereals, both wheat and rice proved to be profitable with their B:C ratio of 2.25 and 2.18 respectively. Among pulses, lentil proved to be most profitable (B:C ratio – 4.05) followed by pigeon pea (3.87), chickpea (3.69), field pea (2.57) and green gram (2.38). Oilseed technology demonstrations also resulted in higher profitability in sesame (2.85) and mustard (5.44). French bean technology demonstrations also gave the higher profitability (4.36).

9.2.2 Horticultural enterprises

Among horticultural crops, major vegetables of summer (okra, onion), winter (cabbage, capsicum, vegetable peas) and kharif (brinjal) were demonstrated. The demonstration included mainly the high yielding varieties and related packages. The results as mentioned in Table 7 indicate that winter vegetable technologies registered higher yield advantages followed by summer. However, onion varieties demonstrated registered the highest yield advantage of 69%. Crop-wise, the yield advantages due to demonstrated high yielding varieties were quite encouraging for cabbage (32%), capsicum (24%), vegetable pea (14%), okra (32%) and brinjal (28%).

Table 7: Productivity advantages in horticultural crops demonstration

Sl. No	Crop	Existing yield (q/ha)	Demo. Yield (q/ha)			Yield Advantage	
			Max.	Min.	Av.	Absolute (Kg/ha)	%
1.	Vegetable Pea	60.0	072.6	062.8	068.4	08.4	14.0
2.	Onion	60.0	112.5	088.2	101.6	41.6	69.3
3.	Tomato	80.0	112.4	084.2	098.5	18.5	23.1
4.	Capsicum	70.0	105.5	078.6	086.5	16.5	24.0
5.	Cabbage	100	148.5	124.6	132.2	32.7	32.2
6.	Okra	86.0	112.0	095.5	103.7	17.7	21.0
7.	Brinjal	198	256.2	146.0	252.5	54.5	28.0
8.	Capsicum	205	260.0	246.0	254.5	49.5	24.1

The profitability was also analyzed for these crops which were found to be remunerative.

Table 8: Profitability advantages in horticultural crop demonstration

Sl. No	Crop	Cost of production (Rs/ha)		Gross Return (Rs/ha)		Net Return (Rs/ha)		BC ratio	
		Farmer variety	Improve Variety	Farmer variety	Improve Variety	F V	I V	F V	I V
1.	Vegetable Pea	28500	040000	036900	098400	08400	88400	1.29	2.46
2.	Onion	21500	035000	074100	101600	52600	66600	3.44	2.90
3.	Tomato	47500	046000	054380	118200	06880	72200	1.14	2.56
4.	Capsicum	27500	032000	053700	086400	26200	54400	1.95	2.70
5.	Cabbage	25500	045000	073010	105760	47510	60760	2.86	2.35
6.	Okra	30600	035000	046200	108900	15600	73900	1.50	3.11
7.	Brinjal	46272	049500	055625	082890	09353	23390	1.20	1.67

FV: Farmer variety; IV: Improve Variety

The B:C ratio was found highest for okra (3.11) followed by onion (2.90), capsicum (2.70), tomato (2.56), vegetable pea (2.40), and cabbage (2.35). The lowest B:C ratio was found in case of brinjal (1.67) (Table 8).

9.2.3 Livestock enterprises

Alike other enterprises, the livestock enterprise demonstrations also gave good results. Two interventions namely backyard poultry and goat rearing were demonstrated among the tribal farmers. The backyard poultry was the new introduction in the tribal districts whereas goat rearing was being done by them since years. As indicated in Table 9, there was 100 per cent yield advantage from backyard poultry and the yield advantage from the superior breed of goat compared to local breed was registered to the extent of about 16%.

Table 9: Productivity advantages in livestock enterprises demonstration

Sl. No	Crop	Existing yield (kg/animal)	Demo. Yield (kg/animal)			Yield Advantage	
			Max.	Min.	Av.	Absolute (Kg/ani.)	%
1.	Backyard Poultry	New Introduction	01.25	00.80	01.10	01.10 (8 weeks)	100.00%
2.	Goat	18.5	26.50	16.25	21.40	02.90	015.67%

The B:C ratio for rearing improved breed of goat was 1.59 as indicated in the Table 10.

Table 10: Profitability advantages in livestock enterprises demonstration

Sl. No	Crop	Cost of production (Rs/animal)		Gross Return (Rs/animal)		Net Return (Rs/animal)		B:C ratio	
		Farmer variety	Improve Variety	Farmer variety	Improve Variety	F V	I V	F V	I V
1.	Backyard Poultry	00.00	00.00	0110	0150	0110	0150	0110	0150
2.	Goat	1500	2200	1932	3500	0432	1300	1.29	1.59

FV: Farmer variety; IV: Improve Variety

9.3 Yield gap minimization

Minimizing the yield gap in various crops due to demonstration of new production technologies was another area of focus under TSP. The yield gap for various cereal, vegetable and pulse crops were ascertained with respect to prevailing district yield, state yield and potential yield. As a result of yield advantages because of technology demonstrations, the yield gap minimized (%) was also worked out for the respective crops. The results as indicated in Table 11 show that yield gap was minimized to the maximum extent with respect to district level yield gap (42-274%) followed by state level (6.53 to 56.7%) and with respect to potential yield (3.25 to 80.96%).

Table 11: Yield gap minimized among tribal farmers due to technology demonstration

Crop	Existing Yield (q/ha)	Yield gap (q/ha) w.r.to			Yield gap minimized (%) w.r.to		
		District	State	Potential	District	State	Potential
Wheat	10.0	13.85	21.22	040.00	66.50	36.85	03.25
Lentil	06.0	09.10	10.20	018.00	57.78	25.49	16.48
Vegetable Pea	60.0	70.70	70.08	150.00	54.40	02.40	03.25
Onion	60.0	118.8	103.2	250.00	59.36	01.55	14.48
Tomato	80.0	119.4	110.3	200.00	50.75	10.70	17.50
Capsicum	70.0	120.9	55.20	150.00	42.33	56.70	28.45
Cabbage	100.0	137.3	124.1	250.00	47.12	06.53	03.71
Rice	9.50	00.58	05.19	015.50	105.75	41.18	80.96
Sesame	1.20	00.02	03.30	006.80	274.50	01.55	57.12
Chickpea	2.50	00.45	03.12	007.50	97.28	03.55	58.20

It was further observed from the same table that cereal crops like wheat and rice, the yield gap could be minimized to the extent of 106% and 67% with respect to district level yield gap respectively. With respect to potential yield, however, gap could be minimized only to 81 and 3 percent respectively. This implies that, there is tremendous scope for minimizing yield gap in wheat by using improved technologies. Similarly, in pulses and oilseeds, the gap could be minimized to the extent of 58% (lentil), 97% (chickpea) and 275% (sesame) with respect to district level yield gap in these crops. However, again with respect to potential, there was lot of scope for bridging the gap by demonstrating and popularizing the improved technologies as well as management practices. Further, it could be also observed from the same table that for the vegetable crops, the yield gap was also minimized to the considerable extent in vegetable pea (54%), onion (59%), tomato (51%), capsicum (42%) and cabbage (47%).



Case 1: Community seed bank for livelihood security in Bundelkhand

Chitrakoot district lies in the Bundelkhand area where approximates 80% area under rain fed condition with very low productivity of crops. The Tribal belt found in the remote area of district at the boundary of U.P. & M.P. The seed is very important input of crop production, in the area farmers used mostly traditional seeds which give very poor productivity and affect a lot with seed born diseases. To ensure the seed availability at farmers door with optimum cost, the KVK try to establish seed bank concept on community basis which is now a successful intervention in the village and a model for replicate at other villages also.

Background Information:

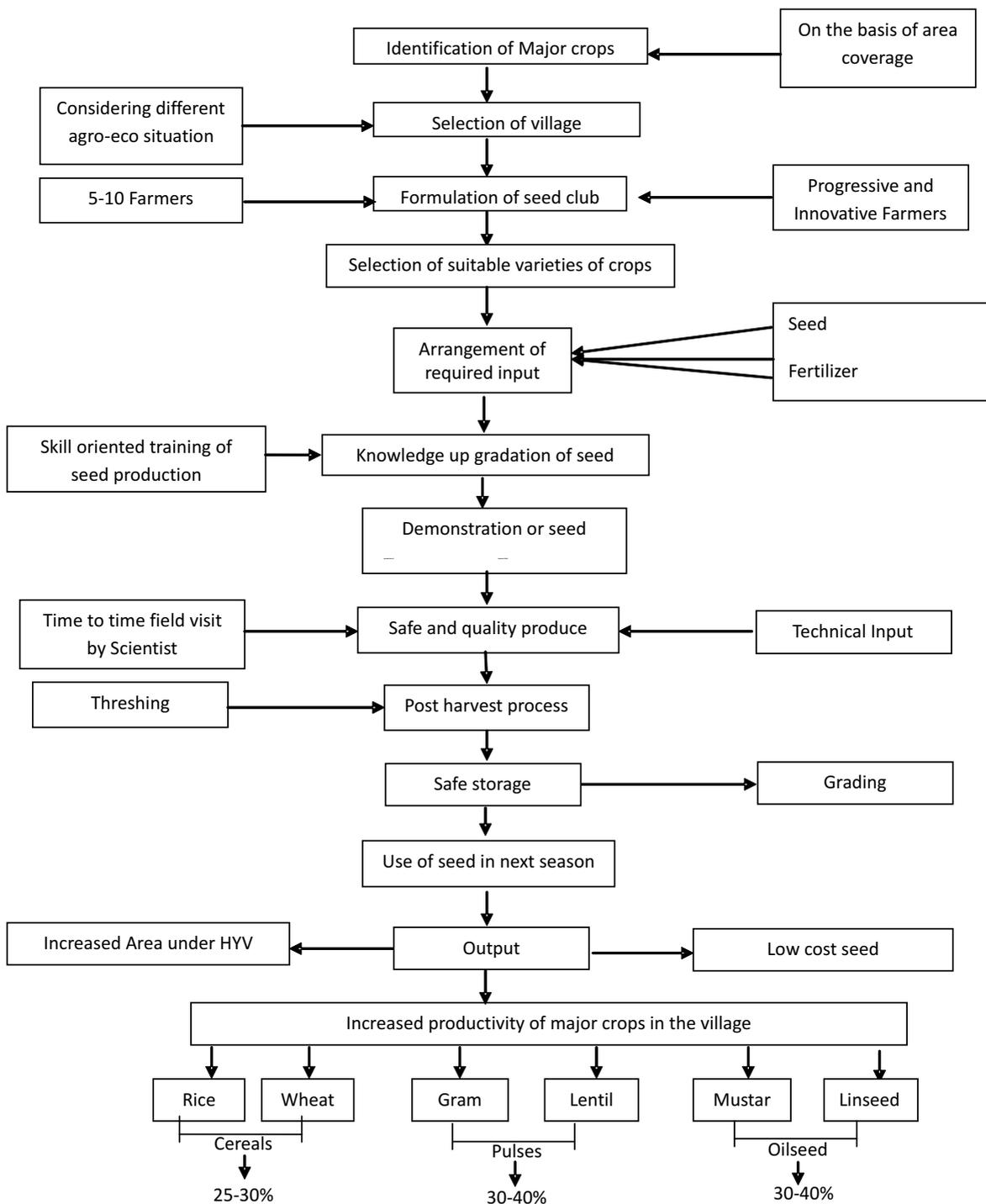
- The income of farmers is mainly based on agriculture, live stock and labour.
- Crop productivity is very less
- Growers have very little knowledge of production technology.
- Crop productivity directly dependent on quality seed
- Thus, quality seed is a key unit for farming sector.
- The community seed bank center was adopted by the innovative farmers of Gopipur and Karaunha village. The pilot experiment done by the KVK, Chitrakoot since last three years.
- In general farmers are using old local seed/ grain for cultivation before adoption of village. So they were got low production and profit.
- During survey of villages for adoption and KVK activities farmers informed all the above problems and they were interested to stop the farming occupation.

Description of technology

- After the analysis of survey KVK scientist accepted these challenges and provided trainings on seed production, seed treatment, INM and IPM and storage etc. Also facilitated them for safe storage of quality seed by formation of seed group village wise to fulfill the requirement of seed to neighboring farmers.
- In each cluster of village farmers selected one progressive farmer as a group leader who is responsible to motivate and collect seed for storage. He also maintained the record of seed distribution to the needy farmers etc. They sell the surplus seed to other farmers, which increase the income of farmers.
- The farmers are able to get quality seed timely at nearest location.
- The productivity of Oilseed, Pulses and cereals were increased up to 25-35% in the village.
- Each member Seed bank of this group is now able to effectively earn Rs. 8000 to 10000 through seed sale.

Dissemination Process

Formulation of seed club and increase productivity of major crops



Institutes Involved



Success points

- The farmers are confident in the concept of community seed bank
- Timely availability of quality seed at low cost in the village itself.
- Increases in cost - benefit ratio.
- Creation of interest in youth farmers.
- Building relationships between villagers

Outcome

- The total cultivated area of crops is increased by 9 %.
- Increases in Livelihood security by more earning due to higher crop production.
- Farmers are able to earn more than 10 to 12000 rupees per year by change in quality seed per year.
- Interest creation in rural youth towards agriculture and allied activity.

Impact

- ★ Initially 50 storage bins provided to 50 farmers and now it is spread to 150 farmers in which 750 quintal seed stored in rabi season. This seed was distributed to 25 farmers of village in about 40 hectare area.
- ★ Farmers of surrounding villages like dandi kolan, barah, haldidandi, Bandhawa etc are also used this seed to get higher production at low cost.



Case 2. Successful effect of TSP programme among Tharu tribes of Lakhimpur Kheri district

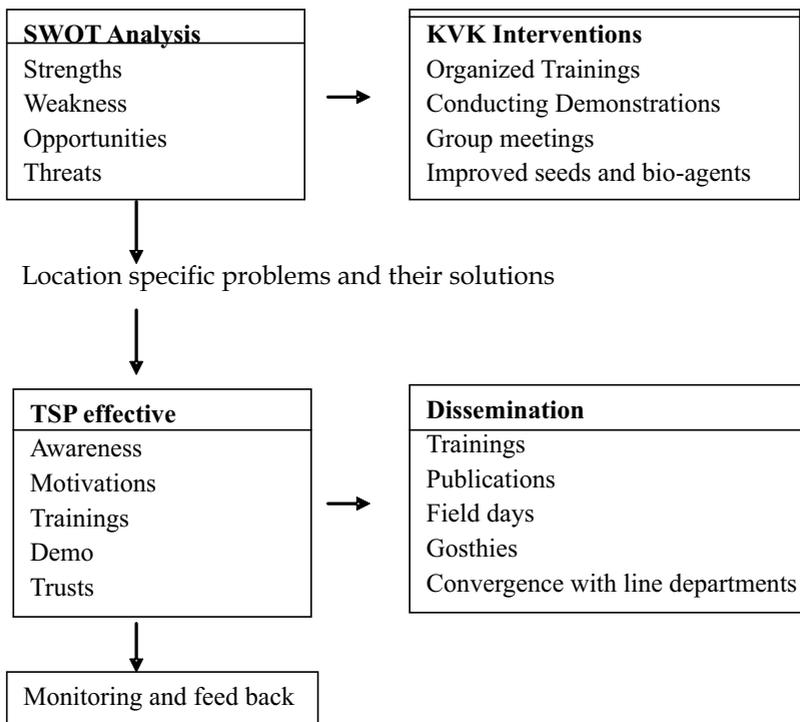
Background information:-

- 1- Sugarcane is the main crop in tribal area with lower production.
- 2- Unidentified vegetable varieties in kitchen gardenig.
- 3- Inadequate technology dissemination in sugarcane & vegetable.
- 4- Unavailability of quality inputs.

Technology Details:-

- Sugarcane crops production affected due to humid area crops suffering with soil born diseases bio agent like trichoderma when applied in the soil to control the same as recommended by research institutes, demonstrated at farmers field.
- Kitchen gardening one of the practice suitable for food and nutritional security. When vegetables are systematically planted season wise and need based their extra earning can also be generated through by selling of surplus produce.

Technology dissemination in tribal area



Output and Experiences of Interventions

Institution	:	KVK, Lakhimpur- Kheri (U.P.)
Dissemination	:	Seed- Improved varieties of vegetables for kitchen gardening. Bio-Agent- Trichoderma spp., Agro-chemical, Chloropyriphos in sugarcane.
Trainings	:	i. Insect and disease management in sugarcane at two village. ii. Food security through kitchen gardening:-
Place	:	Villages:- Singahiya and Bankati
Physical Parameter	:	

Crop	Beneficiaries	Area	Yield
Sugarcane	30	12.0 ha	610.59/ ha
Vegetables (K.G.)	41	0.82 ha	146.59/ ha

Economic Parameter :

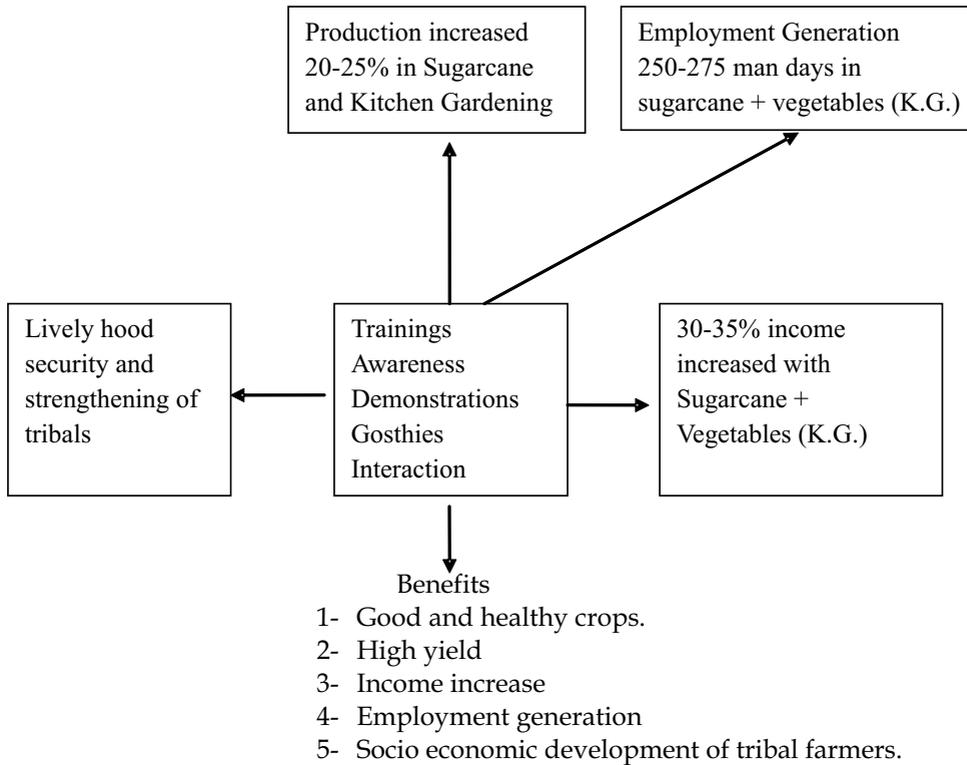
Crop	Farming existing plot	Demo plots	Employment generation
		Net return (Rs./ha)	man days/ household.
Sugarcane	60400/-	81620/-	250
Vegetables (K.G.-)	35600/-	46250/-	25

Success points:-

- 1- Major income source of the community through agriculture (mainly sugarcane, vegetables, poultry, goatery).
- 2- Their potential can be explore by the awareness and motivation.
- 3- Availability of market in their area.
- 4- Higher monetary return due to sugarcane based industries in the district.
- 5- Employment generation.
- 6- Increase in yield / ha due to use of Agro-chemicals / bio-product.
- 7- They have shown keen interest in the respective subject for training.
- 8- Linkages with deptt. of sugarcane, UPCSR and private sugar mills.
- 9- They are living nearby Nepal, so their vegetables easily sellout for fast food.

Output and Experiences of Interventions

Outcome:-



Impact:-

- 1- Looking to the good production of sugarcane & vegetables in Kitchen gardening, tribals come forward to cultivate sugarcane & vegetables with improved agro-technique.
- 2- Farmers are able to improve their living standard, use of Agril. equipments new/ hire basis, good quality inputs, increased their area towards vegetables and sugarcane production.

Case 3: Processing and Packaging of turmeric powder by the tribals of Udham Singh Nagar, Uttarakhand

Krishi Vigyan Kendra, Kashipur under the concept of minimal processing unit is organizing trainings and providing technical information and guidance to farm women on processing and packaging of turmeric through various extension activities, time to time. During the year 2015-16 and 2016-17 Krishi Vigyan Kendra, Kashipur has selected tribal village Audhli Sitarganj block for carrying out extension activities. In this village, detailed survey of the village revealed that tribal farm women of this village grow turmeric and they do not get the optimum price of the same. Scientist have also conducted field visit which created awareness among women on processing of turmeric for income generation. They have been guided on cultivation aspect of turmeric production to enhance the yield. In this context, two farm women namely Sunita Devi and Rajnandni contacted Dr. Pratibha Singh, SMS, Home Science and gained technical information on processing of turmeric. This technique attracted these women and then they started processing of turmeric as an income generation enterprise at village level. They motivated other farm women for turmeric production and contacted Krishi Vigyan Kendra, Kashipur for imparting training to them and gathering relevant information for preparation packaging and marketing of the produce. Krishi Vigyan Kendra, Kashipur (U.S.Nagar) made efforts to train Sunita Devi, Rajnandni and their group for entrepreneurial skills and linking them to the NGO, ISD Kichha and TATA motors for initiating the activity at large scale 43 participant received training on processing and value addition of turmeric dated 30-7-16. During the activity the Hon'ble MLA Shri Prem Singh Rana also visited the site, appreciated and motivated the farm women for working in a collective approach. Thereafter, these farm women processed and prepared 5Q turmeric packets in 250 g, 500 g and 1 kg pack size for sale purpose. Their group has exhibited turmeric packets and these packets were launched by the Hon'ble Governor K.K.Paul, Uttarakhand during 100th All India Farmers Fair at GBPUA&T, Pantnagar during 17 th to 20th October, 2016. This resulted in monetary benefit and popularization of the turmeric packets prepared by the farm women of Audhli Village. This entrepreneurial activity helped in

- Upliftment of economic status
- Effective market linkages feasible to run enterprise
- Employment generation for group members
- Development of role model for others

Glimpses of activities



1. Best practices among the tribals of Bundelkhand (District Chitrakoot)

A. Process oriented

(I) Latest variety seed sustainability

The selected tribal farmers were provided latest HYV of major crops as demonstration and seed production. They also trained for needful practices and given storage bins on community basis as well as individual. They collected required seed quantity for next season with safe storage practices. Now the village Gopipur and Karonha has got sustainability in seed requirement.

(II) Diversification for ensuring income and round the year employment.

Before the starting of project village population was mostly depend on forest produce and illegal cutting of wood for meet out the life requirements. Under diversification they were provided some live units like poultry, goatry, in crop production leveling and irrigation facilities for double or triple cropping intensity, vegetable production as kitchen garden for balance nutritional feed intake.

Now the village population has diverted his engagement from forest to agriculture & allied production to meeting out their need.

B) Outcome oriented

(I) Employment

The tribal village Gopipur and Karonha located very remote in the border of Chitrakoot (U.P.) and Satna (M.P.) district having no basic facilities. They spend whole day and lot of money for wheat grinding and oil extraction. Now both the facilities were installed in the village to create employment to facilitate all habitants of nearby area.

(II) Skill development

The women empowerment is the base of development of any community, the KVK has remarkable outcome in drudgery reduction with the use of small tools by rural women like molded khurpi, serrated sickle, hand sprayer etc. A group of 25 farm women and girls were identified for tailoring training also on the basis of need of the area.

2. Best practices among the tribals of Uttarakhand (District Uttarkashi)

A) PROCESS ORIENTED

(I) Exposure visits to the Farmers' Fairs

Exposure visits of the farmers were organized to acquaint them with the new technologies which could enhance their knowledge as well as income. Total 80 tribal farmers participated in the Kisan Mela organized at KVK, Chinyalisaur on October 10, 2013 and 20 tribal farmers were exposed to the latest technologies in the kisan mela

organized at ICAR-VPKAS, Almora on September 26, 2013. The farmers of the Harshil also demonstrated and sold their hand woven articles in the mela these articles were centre of attraction of the people.

Exposure visits for the farmers was organized for 20 tribal farmers of Uttarkashi District and exposed to the latest technologies in the kisan mela organized at GBPUA&T, Pantnagar on February 13-16, 2015. The farmers were exposed to the various demonstration centers/ units of the University. The Rabi Sammelan cum Kisan Mela organized at KVK, Chinyalisaur on October 14, 2015 in which 47 tribal farmers were exposed to the latest technologies of agriculture and allied fields.

An another exposure visits for the farmers was organized for 20 tribal farmers were exposed to the latest technologies in the kisan mela organized at ICAR-VPKAS, Almora on September 29, 2015. The farmers of the Harshil also demonstrated and sold their hand woven articles in the mela.

(II) Capacity building programmes

Total five training programmes were organized during 2014-15 on different topics like "Scientific cultivation of vegetable and other crops (Awareness programme)", "Nursery management of vegetables", "Scientific cultivation of French bean", "Technique of nursery preparation in tomato" and Nutritional management in apple orchard in which total 229 tribal farmers (30 Male and 199 female) participated. Regular advisory services were provided on field and through mobile advisory.

Six training programmes were also organized during 2015-16 on different topics like "Control of Mite in Apple Orchard", "Scientific cultivation of Vegetable Pea", "Post Harvest Management in apple", "Scientific preparation of Nursery for tomato and Brinjal", "Nutritional management in apple orchard" and Scientific cultivation of French bean and rajmash in which total 222 tribal farmers (40 Male and 182 female) participated. Regular advisory services were also provided timely to the farmers

(III) Participation in Arhar Diwas

Arhar Diwas was organized at Veerpur (Dunda), Uttarkashi, where 25 tribal farmers were participated. They were acquainted about Arhar cultivation. They were informed that Arhar (Pigeon pea) is a major source of protein and important constituent in the food habit of Indian people. Availability of 20-21% protein in pigeon pea is an important source for supplementing the energy rich cereal diet. Additionally, pigeon pea crop improves the soil characteristic and fertility status ensuring better growth to succeeding crop that is considered to be an important asset.

B) OUTCOME ORIENTED PRACTICES

(I) Installation of Vermi-Beds:

Farmers of the tribal villages of Bagori, Sukhi, Jhala in Uttarkashi district, have been provided training on preparation of vermin-compost. The Tetra Vermin Beds were provided to them, in which they can prepare the compost. Twenty vermin beds were

installed in May, 2013 and total 180 tetra-vermin beds (96 m³) were installation in the tribal areas of Uttarkashi. Most of the farmers are utilizing the compost (12-15 q per bed) prepared in these beds in their apple orchards as well as their vegetable crops.

(II) Frontline Demonstrations

Demonstration of vegetables like cauliflower (var. GS 75), vegetable pea (Var. Arkel), cabbage (Var. Varun) and radish (Var. Japanese White) were conducted in 1.0 ha, 1.8 ha, 1.0 ha, and 0.4 ha. area respectively. Total 230 farmers were covered during the demonstration programme in veepur village of Dunda block of Uttarkashi District during 2014-15. Farmers recorded significant yield increase which resulted handsome economic gain to the farm families. Demonstration on poultry was also carried out with 20 farmers of the tribal community. Total 700 day old chicks were provided to demonstrate the economic return through poultry. Farmers started taking eggs from the poultry after 165 days and sold them for meat purpose also.

3. Best practices among the tribals of Uttar Pradesh (District Lakhimpur Khiri)

A) OOUTCOME ORIENTED

(i) Effect of sulphur on the yield of yellow sarson

KVK, Lakhimpur Kheri has conducted demonstration on the farmer's field related to application of sulphur as secondary nutrient on yellow sarson crop as evident from the Deptt. of Agriculture that district suffering with deficiency of sulphur in the soil. The demonstration have been conducted on the 23 farmer's field (6 ha). Before carried out the programme, Trainings are provided with full package of practices of yellow sarson cultivation. More emphasis has been given on sulphur and balanced nutritional also visual symptoms of sulphur deficiency shown to the farmers through pictures. During the demonstration programme sulphur has been provided to each farmer (@ 3 kg./acre 90% WDG cosavet). The performance of crop and the effect presented in tabular form. The data obtained during the cause of crop clearly revealed that yield gap minimized 77.84% at district level, 64.24% at state level and 48.26 at potential level. At the economic parameter 1.85 B:C ratio obtained under demonstration unit as compared to farmer's existing plot i.e. 1.71. Employment generated (Mondays/ household) 70 in care of cultivation of yellow sarson.



The main aim of this project was also identify the suitable technologies and breed identified for large scale promotion by the existing line department for the productivity and income enhancement of the tribal farmers. Under the following subheads, following technologies have been described:

- i) **Appropriate agricultural technologies:** As indicated in Table 12, in the state of Uttar Pradesh, rice varieties Shabhagi and HUR-3032 were identified as the most appropriate for the tribal districts namely Lakhimpur Kheri, Chitrakoot and Sonbhadra. Similarly, for pigeonpea, Sesame and Sugarcane, the varieties ND1, TKG 306 and UP 39 CO 2038 respectively were identified for convergence. The details are furnished as per below table.

Table 12: Appropriate crop varieties for the state of Uttar Pradesh

S. No.	Crop	Varieties	Average yield advantage (%)	Local Yield(q/ha)	Remarks
1	Rice	Sahbhagi	92.00%	9.5	Suitable for Chitrakoot
2	Rice	HUR-3032	56.00%	3200	Suitable for Sonbhadra
3	Pigeon Pea	ND-1	175.00%	8.00	-do-
4	Sesame	TKG-306	325.00%	1.50	Suitable for Chitrakoot
5	Sugarcane	UP 39, CO 2038	750.00%	310.00	Suitable for Lakhimpur Kheri

Similarly, for the state of Uttarakhand, VL 829 and VCM125 were the appropriate varieties of wheat and lentil respectively for upscaling. Other varieties namely PS 3636, Arka RakshaK and Agri Found Parvati were the appropriate varieties for vegetable pea, tomato and garlic respectively. The details are furnished as per below table.

Table 13: Appropriate crop varieties for the state of Uttarakhand

S. No.	Crop	Varieties	Average yield advantage (%)	Local Yield(q/ha)	Remarks
1	Wheat	VL 829	15%	10.00	Suitable for Pithoragarh
2	Lentil	VLM 125	8%	5.10	Hills
3	Vegetable Pea	PS 3636	30%	6.00	Chamoli hills
4	Tomato	Arka Rakshak	20%	241.00	Dehradun
5	Garlic	Agri Found Parvati	28%	175.00	Dehradun

- iii) Appropriate livestock and poultry technologies:- It was further found that for both the states of Uttarakhand and Uttar Pradesh small livestock goat and poultry were found most suitable options for the tribal farmers. In case of poultry, the strains Chabro and Kroiler were most suitable in terms of higher weight gain, local preference and marketability over the local breed. Similarly, in case of goat, the breed Lalitpuri and Barbari were found as the most suitable for meat purpose with significant yield advantages and marketability. The details are furnished as under.

Table 14: Details of livestock and poultry breeds suitable for up scaling among tribal area of Uttar Pradesh and Uttarakhand.

S. No.	Crop	Varieties	Average yield advantage (%)	Local Yield(q/ha)	Remarks
1	Poultry	Chabro Kroiler	1.25 kg/8 week 2.00 kg/bird	Introduction 105 kg/bird	Suitable for Chamoli & Pithoragarh
2	Goat	Lalitpuri and Barbari	22 kg/adult	18.5 Kg/adult	Suitable for Chitrakoot & Lakhimpur





ICAR-Agricultural Technology Application Research Institute, Kanpur

Tel. No. : 0512 - 2533560, 2550927 * website: www.atarik.res.in * email: zpdicarkanpur@gmail.com