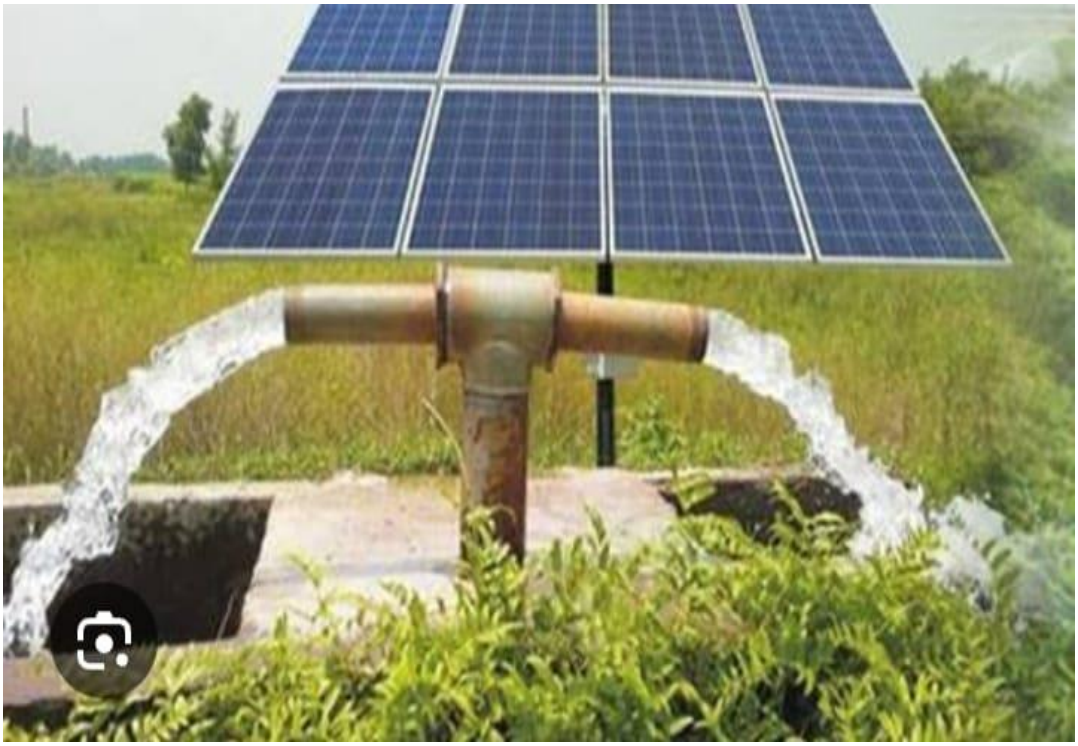
# PROJECT COMPLETION REPORT

## Solar Based Irrigation System
## Under
## SCA to TSS Scheme



Implemented By: - **UNIVERSAL HI TECH**

Supported By: -**JHARKHAND TRIBAL DEVELOPMENT SOCIETY (JTDS)**

**DEPARMENT OF ST, SC, MINORITIES & BC WELFARE (GOJ)**

**KALYAN COMPLEX, BALIHAR ROAD, MORABDI**

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# 1. Executive Summary

The Indian agricultural sector is driven by small holder farmers, who own more than 85% of the land holdings and contribute 51% of the country's production. Climate change, natural disasters and soil degradation have added to the economic after math of the COVID-19 pandemic to create a challenging environment for agriculture. Indian farms are expected to support the food security of more than 1.5 billion people by 2030. This situation calls for a complete transformation of India's agricultural sector.

The convergence of responsible cropping practices along with artificial intelligence and emerging technologies with agriculture provides a brilliant opportunity for India to make its agriculture more agile, data-driven and efficient, while continuing to focus on farmers' well-being, up lifting rural households' standard of living, feeding the population and aligning agriculture to face the climate challenge.

# 2. Introduction

**Globally,2 billion people depend on 500 million small farms for their livelihoods.**

India's marginal and small farmers (who own less than two hectares of land) possess 86%of land holdings, covering 47.3% of the total cultivable area and contributing to 51% of the country's agricultural produce. With every passing generation, land holdings have fragmented further.

These small holders struggle to capture much of the value of their products, which typically travels through numerous intermediaries with whom farmers negotiate from a position of disadvantage due to their lack of access to markets, pricing and grading information and services. Farmers receive as little as 25% of the final selling price of their crop, throttling productive investment and slowing the transition from subsistence to market-oriented farming.

Farmers' limited access to modern machinery, logistics and analytical data – such as on soil composition and climate patterns – leaves them at a disadvantage. Added to that is the worsening fall out of climate change in a sectoral ready prone to the worst effect so for adverse weather and natural processes such as soil degradation and pest attacks. The Indian Council of Agricultural Research predicts that climatic changes could reduce irrigated rice yields by 7% by 2050.

While facing these critical systemic challenges, Indian agriculture is expected to continue producing more food – enough to feed an estimated 1.5 billion people by 2030. In this situation, the welfare of farmers, especially smallholder farmers, and improvement in farm income are essential to ensure that agriculture provides a viable livelihood for existing and coming generations. Yet, rising input costs and low returns from farming, as well as increasing wages in the non-farm sectors, have caused investment in agriculture to shrink even as young people become reluctant to take up farming. Meanwhile, increasingly erratic and unpredictable rainfall is compounding farming risk.

# 3.Jharkhand at a glance

**A. Demography:**

| Indicators | Jharkhand Census 2011 | India Census2011 |
|---|---|---|
| **Total Population** | **329.88lakh** | **121.05crore** |
| **ST Population–Total** | **86.45lakh** | **10crore** |
| **Proportion of ST Population** | **26.2%** | **8.63%** |
| **PVTG Population-Total** | **2.92lakh** | **107lakh** |
| **Literacy Rate–Total** | **67.63%** | **74.04%** |
| **Literacy Rate–ST** | **57.13%** | **57.96%** |

Around 80% of rural population of Jharkhand is directly or indirectly dependent on agriculture.The agricultural economy of the Jharkhand state is characterized by dependence on nature, low investment, low productivity, mono-cropping with paddy as the dominant crop, in inadequate irrigation facilities and small and marginal holdings. The dependence of agriculture on the vagaries of the rain-God can be gauged from the fact that as much as 90% of the total cultivated area is un-irrigated. Primarily a rain dependent state, Jharkhand is witnessing deficient rainfall for the past few years now and even its relatively well-off farmers are becoming daily-wage workers or force to take up other livelihood source.

The period of rain is restricted to only four months in a year, June to September, when monsoon arrives. The remaining eight months are dry. There is some rainfall during the months of December and January in some parts of the state. Even during monsoon, the rainfall is scanty and undependable in many parts of the country. Sometimes the monsoon delayed considerably while sometimes they cease prematurely. Due to lack of different water conservation structure at village level, many a times, in spite of good rainfall the situation become worsen for the farmers to get a good agriculture return. This pushes large areas of the state into low production in agriculture and facilitates them to migrate and leads to remittance-based economy. With the help of different water conservation structure like staggered trenching, bonding, plantation, small water harvesting structure at the suitable location etc. to conserve the water as well as irrigation infrastructure for better utilization of water during the time of water scarcity can effectively enhance the food security as well as cash income for the rural mass.

Therefore, water conservation as well as use of the conserved water through irrigation helps in stabilizing the output and yield levels. It also plays a protective role during drought years. Since, both income and employment are positively and closely related to output, prevention of fall in output during drought is an important instrument for achieving stability of income and employment in the state.

Irrigation confers indirect benefits through increased agricultural production. Employment potential of irrigated lands, increase production etc. is improving income of government from agriculture. Availability of regular water supply will increase the income of farmers imparting a +sense of security and stability in agriculture.

Rainfall Statistics of India -2021

**AGRICULTURE PRODUCE**

- ➔ **Simdega**
- ➔ **E.Singhbhum**
- ➔ **Saraikela-Kharsawan**
- ➔ **W.Singhbhum**

**RAINFALL**

| DISTRICT | MM |
|---|---|
| **Simdega** | 1832.0 |
| **E.Singhbhum** | 1766.9 |
| **Saraikela-Kharsawan** | 1506.0 |
| **W.Singhbhum** | 1045.6 |



**4. Details of scheduled area in Jharkhand (data as per 2011 census).**

| Sl.No | District | No. of TSP Blocks | Total Population | ST Population | % ST Population |
|---|---|---|---|---|---|
| 1 | Sahebganj | 9 | 1150567 | 308343 | 26.80 |
| 2 | East Singhbhum | 11 | 2293919 | 653923 | 28.51 |
| 3 | Jamtara | 5 | 791042 | 240489 | 30.40 |
| 4 | SeraikelaKharsawan | 9 | 1065056 | 374642 | 35.18 |
| 5 | Ranchi | 18 | 2914253 | 1042016 | 35.76 |
| 6 | Pakur | 7 | 900422 | 379054 | 42.10 |
| 7 | Dumka | 10 | 1321442 | 571077 | 43.22 |
| 8 | Latehar | 9 | 726978 | 331096 | 45.54 |
| 9 | Lohardagga | 7 | 461790 | 262734 | 56.89 |
| 10 | West Singhbhum | 18 | 1502338 | 1011296 | 67.31 |
| 11 | Gumla | 12 | 1025213 | 706754 | 68.94 |
| 12 | Simdega | 10 | 599578 | 424407 | 70.78 |
| 13 | Khunti | 6 | 531885 | 389626 | 73.25 |
| 14 | Godda (Sunderpahari, Boarijore) | 2 | 166592 | 127068 | 76.27 |
| 15 | Garhwa (Bhandaria) | 1 | 51488 | 39653 | 77.01 |
| Total | | 134 | 15502563 | 6862178 | 44.26 |

# 5. Jharkhand: General features of the population with focus on Scheduled Tribes

The State of Jharkhand was formed by carving out the Chhotanagpur, Santal Pargana and Hazaribagh Divisions of undivided Bihar in November, 2000. It has a geographical area of79,714 sq km and a population of 26.95 million (Census 2001), 26% of whom are Scheduled Tribes and 12% Scheduled Castes. Jharkhand is also mostly rural, with 78% of the State's population in villages. Salient demographic features of the State are enclosed as Annexure1.

About 3.8 m ha or 48% of the State's geographical area is cultivable. However, the net sown area is only 1.8 m ha1 or about 23% (all India 47%) of the geographical area and more than half of the cultivable land remains fallow. Per capita net sown area is about 0.067 ha (all India 0.15 ha). Only 0.16 m ha or about 8% of the net sown area is irrigated from all available sources. About 30% (2.33 m ha) of the geographical area is classified as forests. About 70% of the farms are smaller than 1 ha in size and another 15% 1 to 2 ha (with an average of about 1.2 ha). Only about 2.5% of the farms are larger than10 ha.

The State has a sub-humid climate with average annual rainfall of 1,300 mm[2]. However, due to high variability of monsoon rains, low moisture holding capacity of soils, absence of developed aquifers due to the hard rock substrate and high run-off due to the undulating terrain, agriculture is fraught with high risks[3]. Even in years of "normal monsoons" with overall rainfall around the long-term average, farmers are often faced with the spectra of total crop failure due to long dry spells at critical junctures in the crop cycle during the wetseasonwhenalmost90%ofthecropsarecultivated.

## Social profile, livelihoods and property relations:

On the basis of the social profile of the people, the broad pattern of livelihoods and property relations, Jharkhand can be divided into three distinct regions. The northern, northwestern and central districts of Garhwa, Palamu, Chatra, Koderma, Giridih, Hazaribag, Deoghar, Bokaro and Dhanbad represent the transition zone between the south Bihar plains and the Chhotanagpur plateau. The population of Scheduled Tribes in these districts is significantly less than the State average and that of Scheduled Castes proportionately more.

[1]Government of India, Planning Commission, Agro-climatic RegionalPlanning Unit (ARPU), Working Paper No.10,August, 1998, page28.

[2]Except in parts of Palamu division where rainfall is in the range of 800-1,000 mm.

[3] As per the categorisation by Indian Meteorological Department, Jharkhand figures in the "drought corridor" of the country, which also includes Rajasthan, Gujarat, Andhra Pradesh (drought prone districts of Rayalaseema and Telengana regions),WestUttarPradesh, Madhya Pradesh (including Chhattisgarh),Bihar and parts of West Bengal

.

Land distribution is highly skewed in favour of the upper castes. Many Scheduled Caste families, such as *Bhuyian*s do not even ave homestead land soft their own. Agriculture is the main source of livelihoods for landowners. The landless subsist as agricultural workers locally or migrate in search of work to all parts of the country. In certain pockets, coal mining is a source of livelihood for the landless. The north-eastern districts of Dumka, Godda, Sahebganj and Jamtara are "agglomerates", a large number of predominantly Scheduled Tribe villages interspersed with a few predominantly non-tribal villages (Latehar in the west and Saraikela in the south have similar composition). The non-tribal communities represent incursions by the settled agrarians from the northern plains (and in the south from Orissa).Though agriculture is the main livelihood source, dependence on forests is significant, especially for Scheduled Tribes. Shifting cultivation is practiced widely in parts of the Rajmahal hills in the northeast. Migration to neighboring West Bengal and to the tea gardens in the northeast supplements' livelihoods. Southern and south western Jharkhand comprising of East and West Singhbhum, Ranchi, Lohardaga, Simdega and Gumla have a uniformly high proportion of Scheduled Tribes (more than50%), especially in rural areas (Pakur in the northeast has a similar composition). Land distribution is fairly even and landlessness insignificant. Agriculture is the main source of livelihoods, supplemented by collection and trade of firewood and other non-wood forest products, and seasonal migration.

## Farming systems and rural livelihoods in Jharkhand:

Rice/paddy, the principal crop of the State sown over 1.3 m ha in 1994-95[4] had an average yield of only 1 ton/ha[5]. Maize, minor millets and pulses are the other principal crops and together occupy about 25% of the net sown area, with similar low yields. Oilseed production is very less. Horticulture and floriculture are yet to pick up in the State While the entire State has an undulating and hilly terrain, there are local differences in topography and it is convenient to classify the landscape as upper-, middle- and lower watersheds. The level of development in agriculture and the overall pattern of livelihoods vary with local topography and distance from urban centers. Forests were the principal source of livelihoods until recently in the upper watersheds that have steeper slopes and are almost entirely populated by the Scheduled Tribes. Each household here would ownsome homestead land, often as much as a tenth of an acre or more, used to cultivate maize, finger millets, beans and some tuber crops. Traditional varieties of broadcast rainfed paddy (*godadhaan*) would be cultivated in the upper and middle portions of the cultivated land.

[4]Planning Commission, *ibid*.

[5]The average yield for India during the year was1.9ton/ha, with TamilNadu having the highest average yield at 3.2ton/ha. Yields vary a great deal with in Jharkhand due to the undulating topography and varying levels of Development of agriculture.

Productivity here is abysmally low and risk of crop failure very high. The narrow valley portions are used to cultivate traditional varieties of transplanted paddy, with low but fairly reliable yields. Modern seed varieties, chemical fertilizers, irrigation and farm machinery are yet to enter these places. Agriculture is entirely for subsistence. Cattle are reared for draft power and manure. A few hens and pigs that scavenge the homesteads serve as buffers. Forest produce, various beans and wage income are sources of cash. Migration increasingly is taking the place of gathering in the livelihood basket.

The middle watersheds with gentler slopes occupy the largest area of Jharkhand. Scheduled Tribes, in majority here, have been settled agriculturists longer in these parts compared to their counter parts in the upper watersheds. However, farming practices remain rudimentary. Chemical fertilizers and improved seeds are used on a limited scale by the more entrepreneurial and less food-insecure. Vegetables and tubers are cultivated on a small scale in the homestead besides maize and millets. *Godadhaan*, millets, pulses and oilseeds are the upland and midland crops. Transplanted paddy is cultivated in the lowlands. The valleys are broader. Paddy yield averages from 0.5 ton/ha in the up land to about 1.5 ton/ha in the valleys. Even short spells of rain failure can significantly reduce crop yields in the uplands and midlands. Open wells capable of irrigating about a tenth to half an acre are now fairly widespread, because of various government schemes, though mainly the non-tribal farmers make good use of these. Land and water management practices, are more evolved than in the upper watersheds. The practice of open grazing after paddy is harvested inhibits winter cultivation even where irrigation is available. Cattle are reared primarily for manure and draft power. Pigs, goats, poultry and a few fruit trees (jackfruit and tamarind) constitute the household economic buffer.

Farming systems in the lower watersheds, comprising gentle slopes and wider valleys, have been influenced to some extent by the green revolution-led advances in agriculture. Small pockets of economic vibrancy have developed near cities and towns. Markets and market routes have been established. Though the Scheduled Tribes are in a minority here, they too have adopted better agricultural practices compared to their counterparts elsewhere. Double cropping, year-round vegetable cultivation and small pockets of sugarcane can be seen in such areas. Cultivated land is managed fairly well in the valleys though water resources have not been harnessed adequately and yields remain below potential. Uplands and forests are poorly managed. Tractors can occasionally be seen in use for ploughing and agricultural transport. Dairy, mainly among non-tribal people, supplements agriculture.

Historically, public interventions by way of capital investment, research and extension to improve agriculture in India have largely been guided by concerns of aggregate food sufficiency and have focused on the irrigated plains and deltas, considered high potential areas.

In case of undivided Bihar, itself far behind other States even in terms of agricultural development, the high potential areas were the northern plains. As the "low potential" part of one of agriculturally the least developed States, Jharkhand thus suffered doubly in terms of policy attention to agriculture. As markets typically follow demand, channels for supply of implements and inputs are virtually non-existent due to absence of demand, and further constrain development of the sector.

Subsidiary farm-based activities like dairy, poultry, etc. generally follow growth and development in agriculture. These have not developed in the State in spite of increasing demand for the products. The State has a large population of scrub cattle, kept principally for draft power and manure. However, due to the practice of free grazing and non-descript breeds of cattle, their contribution to agriculture by way of manure is limited in spite of a large population. This would in the long run hamper intensification of agriculture given the low fertility of soils.

Forests continue to be an important supplemental source of livelihoods for the Scheduled Tribes. Tasar silk and shellac rearing, collection and trade of firewood and a variety of fruits, nuts and leaves are the sources of cash and non-cash income from forests. Jharkhand produces about 60% of the country's raw tropical tasar silk and 56% of its shellac. Declining forests, low capital investment, low levels of technology and a trade chain unfavorable to primary producers are marginalizing this once important source of livelihoods for the Scheduled Tribes.

Low productivity of agriculture, one-dimensional nature of the farm economy and lack of developmenting on-farm livelihood sectors make food security[6] and subsistence the primary concern of farmers in general and tribals in particular.

## 6. Jharkhand Tribal Development Society (JTDS) at a glance

Jharkhand Tribal Development Society (JTDS) was established with the objective of improving the living conditions of tribal people in general and PVTGs in particular. This is sought to be achieved by "organizing and enabling the communities to adopt sustainable and productive natural resource management regimes, adopt market-oriented production systems and learn the skills and gain the experience of planning and implementing development plans relevant to their villages".

JTDS was established on 2002 as a society under Dept. of Welfare, Govt. of Jharkhand. Since its inception it is continuously working for the betterment of Tribal people of Jharkhand. It has successfully implemented the International Fund for Agricultural Development (IFAD) funded Jharkhand Tribal Development Programme (JTDP).

[6] Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.(N C Saxena, Report on the Food Assistance Programme in India, Planning Commission, 2002)

After completion of the JTDP, IFAD again funded for another project called Jharkhand Tribal Empowerment and Livelihood Project (JTELP), which started in October 2013 and was completed on December 2021. Under JTELP, JTDS has worked with 2.11 lakhs households in 1779 villages of 32 blocks spread across14 districts of Jharkhand.

## 7. About Agency

Universal Hi Tech was founded in 1998, specializing initially in solar modules. As pioneers in Jharkhand and the eastern region, we introduced solar power systems to the state. Subsequently, we secured distribution from Tata BP Solar (now Tata Power Solar) and Exide Industries. As part of the esteemed TATA Group, we operate in Jharkhand and trade products and services throughout India. Our presence is felt in household and shop in Jamshedpur, regardless of size or nature. With a combined generation capacity of 12742MW, 30% of which comes from clean energy sources, Tata aPower is undergoing a transformation from an electricity utility company to an energy solutions company. We are continuously progressing and innovating next-generation solutions such as electric vehicles and their charging, storage, solar rooftop microgrids, and more. With a 100-plus-year record of technological leadership, world-class safety processes, green initiatives, community development, and more, TATA Power is committed to "lighting up lives" for generations to come.

- Universal hi-tech has complete 26 years in the industry with phenomenal result in terms of business growth and customer satisfaction.
- We are one of the longest serving and integrated solar company in India and ensure highest quality and reliability to our customers.
- Universal hi-tech has won many best distributors award in the eastern region.
- Universal hi-tech has been playing a very prominent role in the solar sector and have been involved in various government projects.
- It has been a government contractor from past 7-8 years.

We have worked on project for JREDA department (Jharkhand renewable energy development agency), DWSD (Drinking water and sanitation department ), JTDS (Jharkhand tribal Development society).

## 8. Central sponsored scheme SCA to TSS at a glance

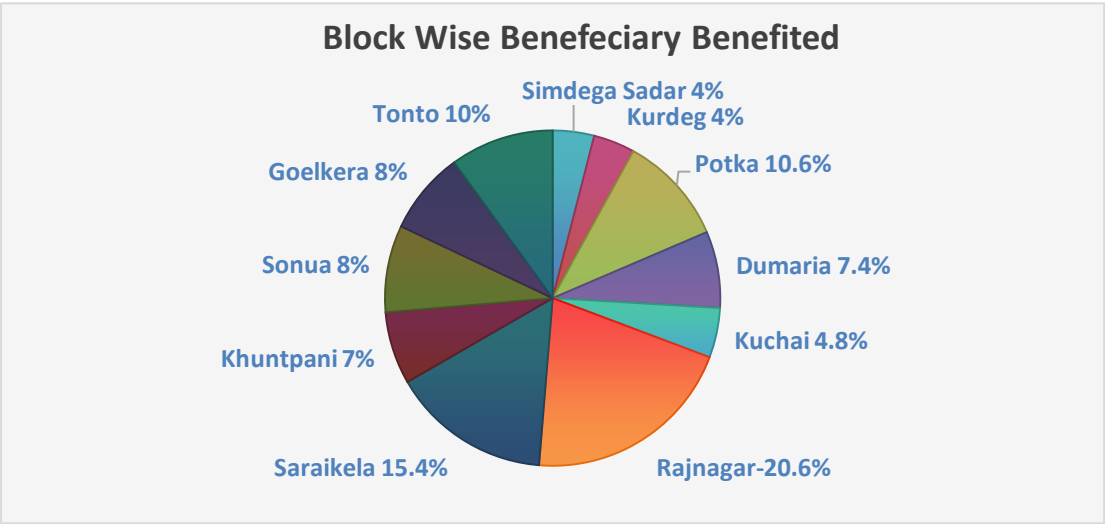
Special Central Assistance to Tribal Sub Scheme (SCA to TSS) is part of the Umbrella Scheme for Development of Scheduled Tribes which is now a Core of the Core Scheme.

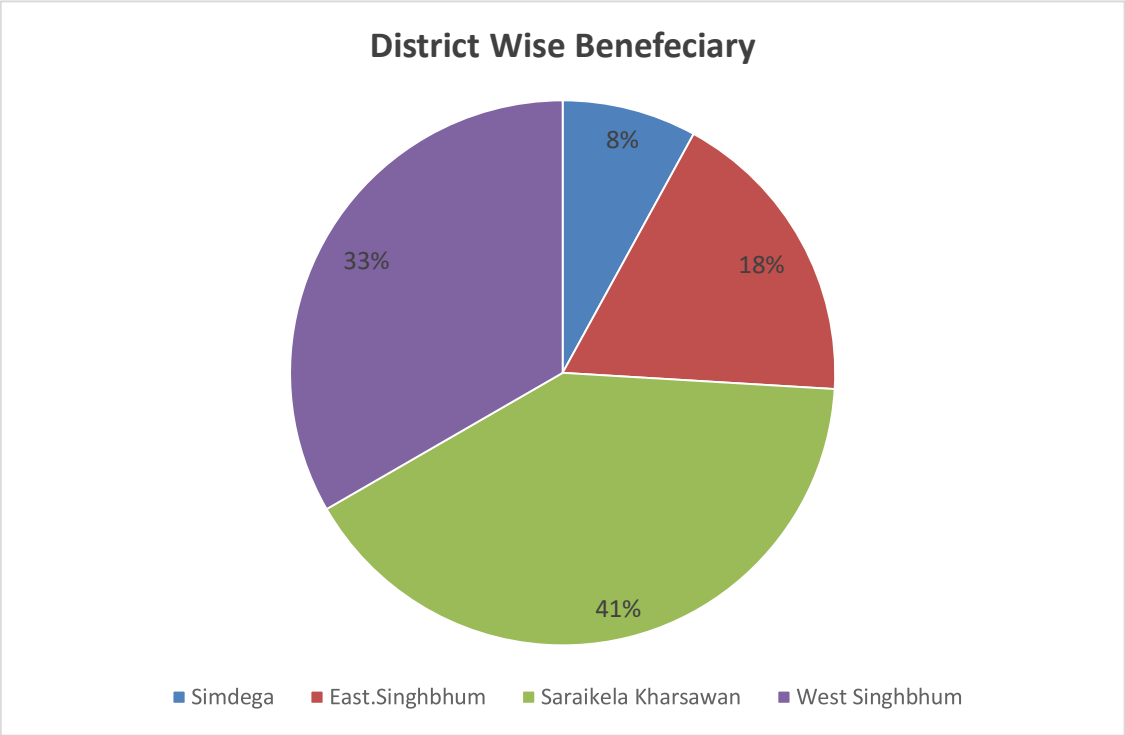
Special Central Assistance to Tribal Sub-Scheme (SCA to TSS) is 100% grant from Government of India (since1977-78). It is charged to Consolidated Fund of India (except grants for North Eastern States, a voted item) and is an additive to State Plan funds and efforts for Tribal Development.

This grant is utilized for economic development of Integrated Tribal Development Agency (ITDA), Integrated Tribal Development Project (ITDP), Modified Area Development Approach (MADA) Pockets and Clusters, PVTGs and dispersed tribal population.

# 9. Project Brief

| Beneficiary details | | | |
|---|---|---|---|
| **Sr.No.** | **District** | **Block** | **No.ofBeneficiary.** |
| **1** | **Simdega** | Simdega Sadar | 20 |
| | | Kurdeg | 20 |
| **2** | **East Singhbhum** | Potka | 53 |
| | | Dumaria | 37 |
| **3** | **SaraikelaKharsawan** | Kuchai | 24 |
| | | Rajnagar | 103 |
| | | Saraikela | 77 |
| **4** | **West Singhbhum** | Khuntpani | 35 |
| | | Sonua | 42 |
| | | Goelkera | 40 |
| | | Tonto | 50 |
| **Total** | | | **501** |






## 10. Project Objectives

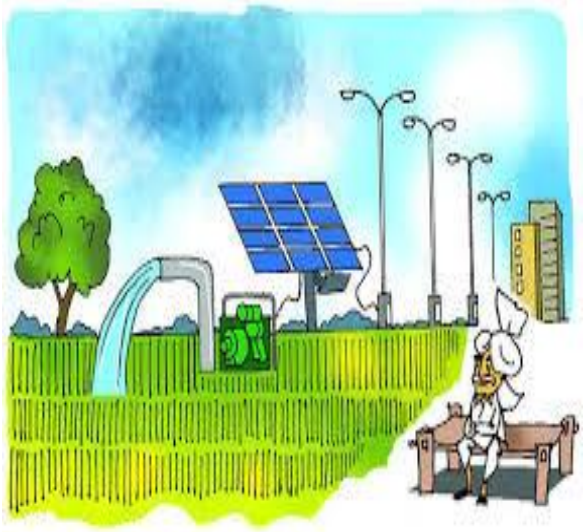



## 11. Project Outcome

- **The community-owned solar irrigation model could be economically very attractive:** -The tribal community members cultivated their homestead lands, typically ranging between 3 and 4 acres, using irrigation from the pump. Solar pumps are expected to have the most impact in the Non-Kharif season by enabling cultivation through irrigation access, particularly during summers. All the tribal members uses the solar pump during the Kharif season and maintain the fertilizer of the soil for the upcoming period.
- The additional income was about 30-32% of the project participants annual agriculture income from the previous year.
- Most of the respondent's self-consumed their harvest, while some were able to sell it within their village.Hence overall impact on income is difficult to estimate but it can reflect better income then previous.
- There were no diesel-pump-using farmers among the survey respondents to compare the cost of irrigation with diesel pumps.
- Beyond Cultivation the pump also helped to improve the quality of life of the beneficiaries.
- Almost half of the beneficiaries /villagers used water from the pump for household needs and livestock rearing along with Agriculture.
- All the members or beneficiaries connected to borewell used the water for drinking purposes as well.
- The model proved to be very economical for villagers/participants.

- Overall,100% of beneficiaries expressed complete satisfaction with the project and said that investment was fully worth it.











Latitude: 22.637243
Longitude: 85.934265
Elevation: 1495.62±19 m
Accuracy: 9.5 m
Time: 11-21-2023 14:17
Note: Bara Bana
Powered by NoteCam
Note: Burka solar Irritated field,Sisai,Gumla.
Powered by NoteCam


Latitude: 22.521883
Longitude: 86.135056
Elevation: 172.76±4 m
Accuracy: 1079.0 m
Azimuth: 129° (SE)
Pitch: -18.8° (9.8°)
Time: 30-07-2024 11:26
Note: SBIS Radur, Potka, ES
Powered by AngleCam



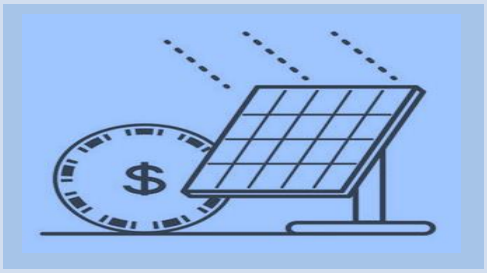




**Remarks: - Above photograph are of cultivated land after the installation of Solar Water pump**

# 12. Project Impact

**Project impact is assessed on Quantitative and Qualitative parameters and farmers experience shared during different interactions:**

| Quantitative impact | Qualitative impact |
|---|---|
| ***Economic impact (Forecasted)***<br><br>➢ Improvement in yield<br>➢ Decrease in cost of cultivation.<br>➢ Increase in revenue (farm-gate price)<br>➢ Profit/loss from sale of produce<br>➢ Increase in net household income<br><br>***Environmental impact***<br><br>➢ Uses of diesel and electricity decreases.<br>➢ Ozone free system<br>➢ No emission of CO2 Gas<br>➢ Free from other heat trapping greenhouse gases<br>➢ Noise free<br>➢ Best use of renewal Energy<br><br>***Inclusivity Impact***<br><br>➢ Maximum number of impacted due to water source<br>➢ Better family well being<br>➢ Change in life style of the farmer | ***Trust and transparency***<br><br>➢ Information asymmetry removed.<br>➢ Improvement in Knowhow regarding Solar water Pumping system<br>➢ Clean energy system<br>➢ Promise benefit over the long term<br>➢ solar energy, trust is non-negotiable<br><br>***Behavior and adoption***<br><br>➢ Adoption and active use of renewal source of energy<br>➢ Adoption of SOP in crop cultivation round the year<br>➢ Contribute to 50-60% of growth<br>➢ Economical system adopt by the farmer group<br><br> |

# 13. Solar Based Irrigation System



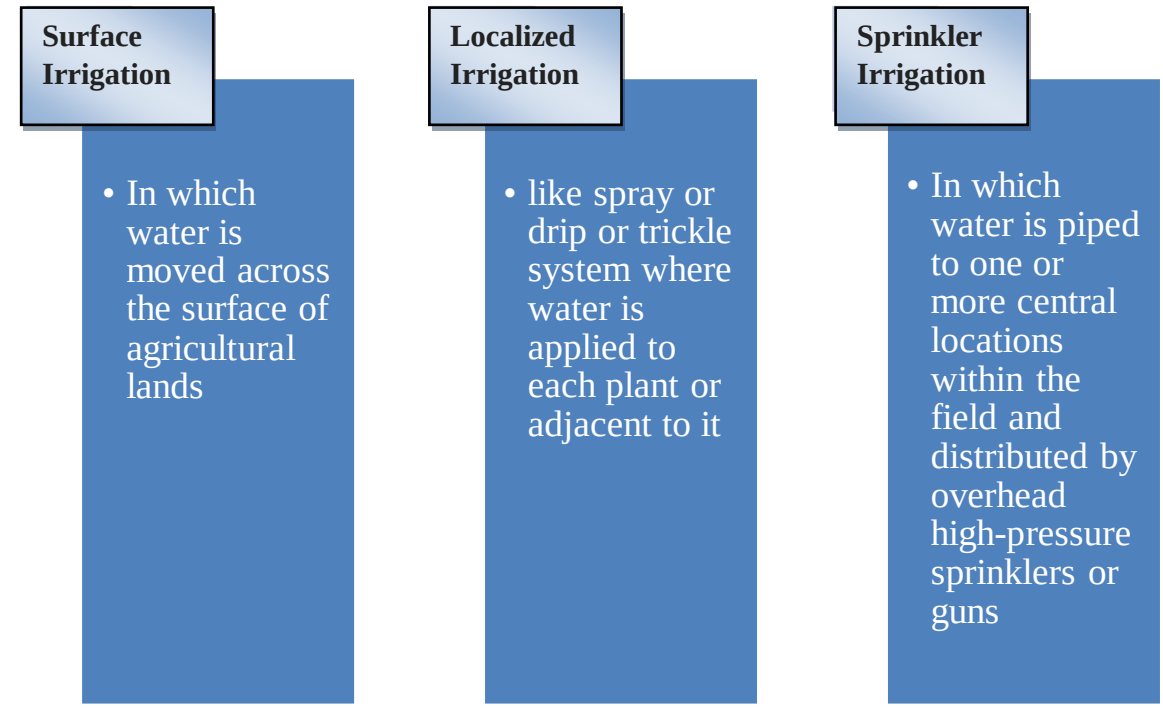
## *What is solar Irrigation*

Solar irrigation uses the sun's energy to power a pump which supplies water to crops to help growth.Solar energy can be used in agriculture and irrigation in a variety of ways. One common application is using solar panels to power irrigation pumps, which can save farmers money on electricity costs and reduce their dependence on fossil fuels. Solar-powered drip irrigation systems can also be used to deliver precise amounts of water to crops, reducing water waste and increasing crop yields. Additionally, solar energy can be used to power temperature control systems in greenhouses,allowing farmers to grow crops year-round. The use of solar energy in agriculture and irrigation can also help to reduce greenhouse gas emissions and promote sustainable farming practices

## *Why is solar Irrigation Important*

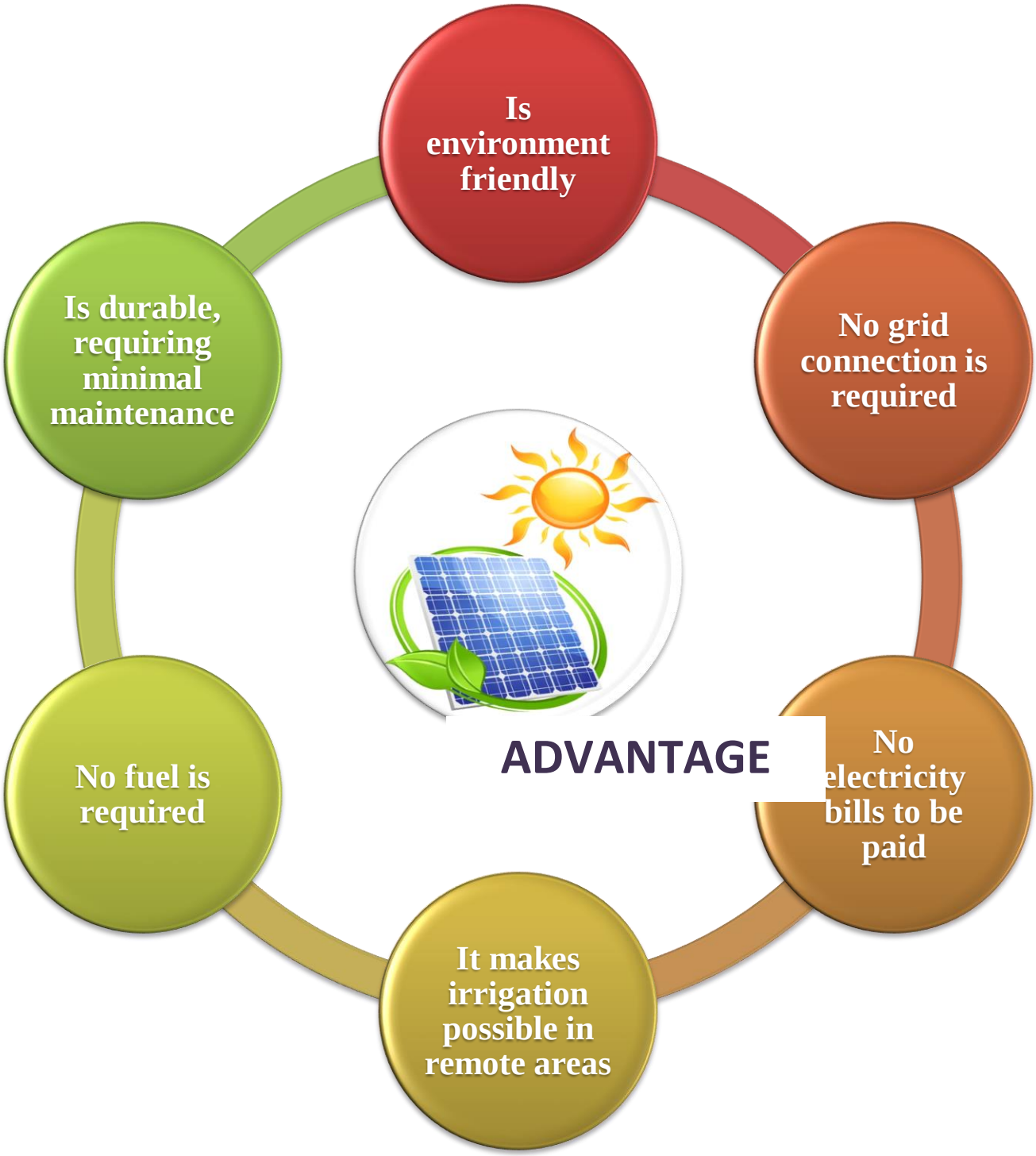
To grow the highest quality crops in the most efficient way they must have the right amount of water at the right time. Too little or too much water will lead to crops wilting, soil erosion and poor nutrient uptake of the plants. Irrigation is the controlled application of water to respond to crop needs.

## *Types of Solar Irrigation System*




## *Uses of Solar Irrigation System*

The benefits of using solar water pumps in agriculture are numerous. Reduce the cost of irrigation, which can be a significant expense for farmers. Provide a reliable source of water, which is essential for crop growth. Eco-friendly and does not contribute to global warming.


Is environment friendly
No grid connection is required
No electricity bills to be paid
It makes irrigation possible in remote areas
No fuel is required
Is durable, requiring minimal maintenance
ADVANTAGE

## 14. Methods of preparation/Installation/Execution

Step1:-Meeting Conducted with the selected district DPMU Team for working on Solar Based Irrigation System under SCA to TSS Scheme.

Step2:-

Gram Sabha organize at the selected village and necessary document are collected from the selected farmer.

Step 3:-

Jointly site survey of listed farmer has done with concern district DPMU team.

Step 4:-

Solar Based Irrigation System structure has delivered to farmer site and installation of structure had completed.

Step 5:-

Solar Module and pump has delivered to farmer site then our engineer has installed the solar pump with QRC outlet was built on site.

Step 6:-

All completed site had been jointly visited by agency representative, Geologist and concern district DPMU Team. Bore well discharge report was prepared by Geologist.

Step 7:-

After Installing of Solar Pump Fencing work has completed for safety of solar based irrigation system.

Step:-8

Training session was conducted by the company representative on site. Then Installed Solar Based Irrigation System was handed over to beneficiary for utilization of water.




**OFFIFIAL MEETING WITH CONCERN DPMU TEAM BEFORE THE EXECUTION OF WORK**












**GRAM SABHA ORGANIZE AT VILLAGE WITH DPMU TEAM**



7

**SITE SELECTION AT BENEFICIERY FILED**




BORE WELL DIGGING GOING ON

**INSTALLTION OF SOLAR PUMP AT VARIOUS PLACE AT SELECTED BENEFICIERY**








# Final Installation of Solar Based Irrigation System (District Wise)
# SIMDEGA




**Village-Barkibuira, Block-Kurdeg**




**Village-Pithra, Block-Simdega Sadar**

# WEST SINGHBHUM




**Village-Baijoro, Block-Sonua**




**Village-Gotampi, Block-Tonto**

# SARAIKELA KHARSAWAN




**Village-Gamharia, Block-Rajnagar**




**Village-Jhalak, Block-Rajnagar**

# EAST SINGHBHUM




**Village-Ganakpada, Block-Potka**




**Village-Kolaberiya, Block-Dumaria**

## 15. Case Study

### A. ***District- West Singhbhum***

### Adoption of new Technique helps enhanced earning during Summer

Village Sharda is JTELP intervened village situated on 75 NH away 6KM from District Headquarter Chaibasa. 32 years old young farmer named **Mangu Kandaiburu**lives inthis village. He has a big family formed with an old father,wife, two daughters, one nephew and three teenage orphan children from his village. He fosters 9 members family with the help of a small "Kirana Shop'. **Mangu** has small holding
of land on which his family usually prefer to go for paddy cultivation through direct seeding of paddy. Due to climatic vagaries they could not harvest good yield in khariefseason.Farmers of this village those having their own source ofirrigation are practicing vegetable cultivation in all sports of
land in all seasons but **Mangu** has upland mostly therefore he was deprived from reap the fruits of his resources.




After completion of JTELP DPMU WS has made a proposal to install Solar based Irrigation system under SCA to TSS in this village. The happiness of the farmers knew no bounds after hearing the proposal. They called Gram Sabha meeting immediately and they accept it. GSPEC have submitted all necessary documents and Mango planted tomato nursery for 2 acres of land. Delay of solar instillation it got dry but **Mangu** did not lose his heart.

Solar irrigation system installation finally done on 28 February 2023 and before this **Mangu** prepared his land to grow coriander leaf. At present he planted coriander leaf, ladyfinger, Cucumber, Sponge gourd and local leafy vegetables not for consumption but selling purpose too. At present **Mangu** selling his vegetable product in '**Mangla Hat' Chaibasa**daily and is bearing fruit adding to the income of his family. Every day he used to go market for vegetables selling and his depended take care of the farm. These days happiness shines on his face he is very thankful to JTDS. Now he is motivating the fellow farmer to utilize the new irrigation technique, Hemant Jarika , Arjun Banraare also doing same to him. Often farmers of his village facing problem to get tractor to plough the land therefore **Mangu** is planning to purchase a tractor for his own. His hard work and desire to win will definitely fulfill his dream.




| S. No. | Vegetable grown | Area covered (Decimal) | Input Cost (In RS.) | Expected Income (In RS.) |
|---|---|---|---|---|
| 1 | Coriander leaf | 20 | 800 | 9000 |
| 2 | Lady finger | 80 | 2500 | 45000 |
| 3 | Sponge gourd | 10 | 1000 | 7500 |
| 4 | Local leafy vegetable | 10 | 600 | 2000 |
| 5 | Cucumber | 30 | 1000 | 8500 |
| Total | | 120 | 5900 | 72000 |

## ***B.District- SaraikelaKharsawan***

Under the project SCA TO TSS, in financial year March 22-23 the project has been working on the thematic areas to enhancing capacities and promoting clean technology supporting livelihood development by increasing food production. The project has been working on an initiative to promote a sustainable comprehensive framework of technology transfer.




The Water User Group (WUG) so formed in this activity (Solar Irrigation System) isimproving the areas to adopt clean reliable and cheaper energy form. Largely dominated by Tribal community the region has an abundance of ground water resources but lacks affordable ways of accessing it in undulating regions. Therefore the model not only empowers the groups controlling and managing the irrigation assets but also accelerate the adoption of climate smart technology and extending cheaper, reliable and greener irrigation system.

The irrigation asset consists of 3-5 Hp fixed solar based irrigation pump. These systemare owned by Gramshabha and managed by WUG of villages, supported by JTDS .The group members more often are aware and exposed to different government programmes supporting the socio-economic development of farmer's. Besides being a part of WUG they are also exposed to climate smart technologies. These groups spread awareness amongst other community members and are catalyst of change in adoption of new technologies.

Installation of 9 units in March 2023 benefits around150-200 farmers

directly, which are able for ground water use for irrigation purpose.

The activity performed during the pilot phase in MurkumvillageofSeraikela Block irrigated around 1Acre of land during this Garma season. Farmers involved namely Mangal Sardar, Seema Sardar and Balram Sardar irrigated and cultivated vegetables and green leafy. Harvesting 2-3 times, resulting an income of INR 2000-3000 per beneficiary in last 2 -3 months of one garma season .Since this is an entry phase the farmers are more generous to adopt this technology for all three seasons.






Similarly apart from this, all the other units have a similar view as this has run in its entry phase. However full extension and growth is about to explore yet.

## ***C.District- Simdega***

# Solar Based Irrigation System –A hope to Farmer

In Simdega ,Sewai a village Under Sadar Block known for HArd Working and Progressive Farmers.Despite eagerness to grow crops during winter and summer season they were unable to do so due to lack of proper irrigation facility in their tola (Farsa Toli).




Farmers of this tola earlier take three crops in a year by irrigating their land by water of nearby Dam which comes their tola by a canal. They had also planted fruit plants during this period, the fruits of which they still sell to nearby market thus a sustainable source of income for the farmers.

But due to siltation the water storing capacity of dam decreases as the time passed. Due to this condition of dam the availability of water for irrigating the crops of this tola decreases, forcing farmers to fallow their fertile during winter and summer season.

During our field visit to this village Laxman Manjhi shown his keen interest to install Solar Based Irrigation System in his land, so that he along with him other adjoining land owners (farmers) could once again regain the utility of eir fertile land. After the successful installation of the system, he was able to irrigate his paddy and Groundnut crops during the lean period of Monsoon. After the Khariff crops he cultivated Rabi crops (Winter Crops) and vegetables after a long period of time along with other neighboring farmers. He sells the vegetables and Potatoes to nearby hat to earn Rs 3500 during the season. He has also cultivated Onion, Garlic, Green pea, Mustard, Wheat which are still to be harvested

He has planned to keep some of the harvested crops and vegetables for family consumption while remaining to be sold in market for earning income in order to meet household expenditure.

Provision of such system as irrigation facility to small and marginal farmers residing in remote area as Laxman Manjhi is a boon in term of itsuninterrupted source of water for irrigation purpose at no operational cost such as requirement of electricity or high-cost d

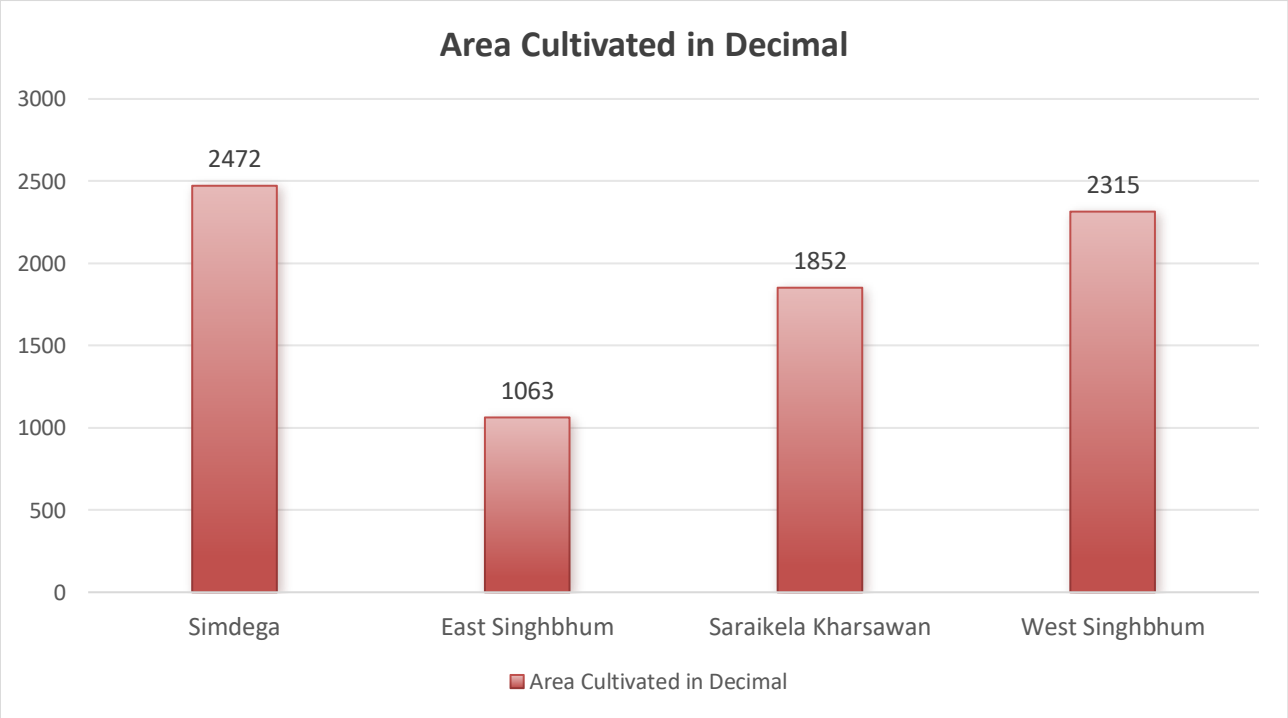


## 16. Annexure1: District wise detailed report of Solar Based Irrigation System

# Solar Based Irrigation System

| S. No | Name of District | No of Unit | Block covered | Panchayat Covered | Village covered | No of HH Benefitted | Area Cultivated in Decimal (From SBIS) |
|---|---|---|---|---|---|---|---|
| 1 | **Simdega** | 4 | 2 | 4 | 4 | 40 | **2472** |
| 2 | **East Singhbhum** | 5 | 2 | 4 | 5 | 90 | **1063** |
| 3 | **SaraikelaKharsawan** | 9 | 3 | 7 | 9 | 204 | **1852** |
| 4 | **West Singhbhum** | 8 | 4 | 7 | 8 | 167 | **2315** |
| **Total** | | **26** | **11** | **22** | **26** | **501** | **7702** |

***Cultivation is still continuing……..***




***List of Land Owner/Benfeciary***

| S.N. | District | Block | Panchayat | Village | Benefeciary Name | Beneficiary Aadhar no |
|---|---|---|---|---|---|---|
| 1 | SIMDEGA | SADAR SIMDEGA | PITHRA | PITHRA | Lewtina Lakra | 739540364330 |
| 2 | SIMDEGA | SADAR SIMDEGA | SEWAI | SEWAI | Laxman Manjhi | 539359266380 |
| 3 | SIMDEGA | KURDEG | KUTMAKACHHAR | PATRAPALI | Shivbrath Sai | 948840794680 |
| 4 | SIMDEGA | KURDEG | BADKIBIURA | BADKIBIURA | Krishna Sai | 744026898479 |
| 5 | EAST SINGHBHUM | POTKA | CHAKRI | RADUR | Gunadhar sardar | 356385992073 |
| 6 | EAST SINGHBHUM | POTKA | NARDA | KUNDRUKOCHA | Lagpati Sardar | 424613816090 |
| 7 | EAST SINGHBHUM | POTKA | JAMDA | GANAKPADA | Chandan Munda | 791450867394 |
| 8 | EAST SINGHBHUM | DUMARIA | DHOLABERA | KOLABERIA | Open Soren | 810113846027 |
| 9 | EAST SINGHBHUM | DUMARIA | DHOLABERA | DASHDIH | Chhabilal Soren | 330269559576 |
| 10 | SARAIKELA KHARSAWAN | SARAIKELA | MURKUM | BADABANA | Community land | 206810098325 |
| 11 | SARAIKELA KHARSAWAN | SARAIKELA | MURKUM | JHALIAPOSI | Community land | 930746561951 |
| 12 | SARAIKELA KHARSAWAN | SARAIKELA | MURKUM | MURKUM | Mangal Sardar | 776986962138 |
| 13 | SARAIKELA KHARSAWAN | KUCHAI | CHOTASEGOI | KARALOR | Geeta Munda | 885239710883 |
| 14 | SARAIKELA KHARSAWAN | KUCHAI | RUGUDIH | SOSOKADA | Singray Munda | 630905566085 |
| 15 | SARAIKELA KHARSAWAN | RAJNAGAR | BANDU | BANDU | Jaymuni Murmu | 583051936052 |
| 16 | SARAIKELA KHARSAWAN | RAJNAGAR | GAMHARIA | GAMHARIA | Chaiten Murmu | 944512672782 |
| 17 | SARAIKELA KHARSAWAN | RAJNAGAR | JONBANI | JHALAK | Birsingh Soy | 342467932093 |
| 18 | SARAIKELA KHARSAWAN | RAJNAGAR | VIJADIH | KUMDIH | Biduram Soren | 317716751007 |
| 19 | WEST SINGHBHUM | KHUNTPANI | KEYADCHALOM | TUNGI | Markendey Dorai | 735283844967 |
| 20 | WEST SINGHBHUM | KHUNTPANI | BARAGUNTIYA | SHARDA | Mangu Kandaiburu | 821515253264 |
| 21 | WEST SINGHBHUM | SONUA | DEWANBIR | DEWANBIR | RaisinghLaguri | 343187972268 |
| 22 | WEST SINGHBHUM | SONUA | ASANTALIA | BAIJORO | BagunBodra | 592773475684 |
| 23 | WEST SINGHBHUM | TONTO | PURNAPANI | GOTAMPI | Birsa Barjo | 997712435610 |
| 24 | WEST SINGHBHUM | TONTO | PURNAPANI | PERTOL | Madhu Sudan Sundi | 927558642579 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 25 | WEST SINGHBHUM | GOILKERA | ARAHASA | SARBIL | Mangal Singh Korah | 543271896094 |
| 26 | WEST SINGHBHUM | GOILKERA | BARA | DORBO | Antu Kerai | 402435257996 |

## ***PROJECT CONCLUSION: -***

Solar Water Pumping Systemare cost-effective, reliable, and environmentally friendly.

- Cost-effective: Solar water pumps have lower operating costs than traditional pumps. They require no fuel and have minimal maintenance costs.
- Environmentally friendly: Solar water pumps are an environmentally preferable option to conventional pumps because they don't emit any hazardous gases.



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