

PART I: EXECUTIVE SUMMARY

1. Project Title: Science Technology and Innovation Hub for Development of Scheduled Tribes Community in Kagaz Nagar Mandal, Adilabad District, Telangana State.

2. Name of the Institution & Address

Malla Reddy Engineering College
Main campus, Maisammaguda,
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3. Details of the Project Team

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4. Project Area Profile:

(a) Demographic Details (give details of geographical area covered, climate, land use & cropping patterns)

Geographical Area



Figure: Telangana State



Figure: Adilabad district

The district comprises an area of 4,153 square kilometres (1,603 sq mi). with a density of population of 170 persons per sq.km . There are 508 villages exist in Adilabad district.

According to the Census of India, the residual Adilabad district has a population of 708,972, with a ratio of 989 females to 1000 males. 23.66% of the population lives in urban areas. The literacy rate is 63.46%. Scheduled Castes and Scheduled Tribes make up 99,422 (14.02%) and 224,622 (31.68%) of the population respectively.

Climate and Rainfall conditions in Adilabad

With the exception of the south-west monsoon season, the district's climate is characterised by scorching summers and dry conditions in general. Four seasons can be used to categorise the year. The summer season, which lasts from March through May, comes after the chilly season from December through February. The south west monsoon

season lasts from June to September, and the post monsoon season lasts from October to November.

The district experiences a rise in rainfall generally from the south-west to the north-east. The south-west monsoon season accounts for about 85% of the country's annual precipitation. Being the wettest month, July. The annual rainfall does not vary significantly from year to year. The district typically receives 1044.5mm of precipitation each year.

At the administrative centre in Adilabad, there is a meteorological observation station. When the temperature starts to significantly drop at the end of November, the cold weather starts. With a mean daily high temperature of roughly 29 degree C and a mean daily minimum of 15 degree C, December is often the coldest month of the year.

Generally speaking, during the south-west monsoon season, the relative humidities are high. The summer season, when the humidity reaches a high of 25% in the afternoon, is when the air is normally the driest of the year.

The sky is frequently clouded over during the south-west monsoon season. In the post-monsoon season, clouds rapidly disappear. The sky is mainly clear during the rest of the year.

Soil in Adilabad

Red and black soil are both found in Adilabad district though black soil predominates, accounting for almost 72% of the soil in the district. The mineral resources are mainly limestone and manganese ore .

Major Crops in Adhilabad.

CROP	AREA IN HECTARES	OUT-TURN IN TONNES
Cotton	310363	723297

Rice	70745	187267
Soyabean	58771	84630
Redgram	40631	26817
Jowar	28792	35462
Maize	22020	68773
Bengalgram	17204	25341
Greengram	8076	5240

Table: Statistics of Adilabad Cropping Patten

(b) Target Area/Location for Establishing STI Hub (please mention whether the target area (STI Hubs) falls under aspirational district or PMAGY Village etc) – As far as possible the STI should be located in the vicinity of the beneficiaries.

In the Indian state of Telangana, Kagaz Nagar is a town and a mandal. There are 38 villages in this Mandal overall. The sex ratio in Kagaz Nagar Mandal is 995 females to every 1000 males.

Population of Kagaz Nagar

Population	Males	Females	Households
110,078	55,168	54,910	26,282

Table: Population of Kagaz Nagar

Telangana's Kagaz Nagar Mandal will have a population of 145,303 in 2023. There are 110,078 people residing in Kagaz Nagar overall, of which 55,168 are men and 54,910 are women, according to the 2011 Indian census. In 2022, 140,900 people are expected to live in Kagaz Nagar. There are 68,846 persons who can read and write, of whom 30,484 are women and 38,362 men. There are 41,666 workers who depend on multiple skills, 29,311 of whom are men and 12,355 of whom are women. A total of 6,617 people depend on

agriculture farming, of which 5,486 are men and 1,131 are women. In Kagaz Nagar, 6,041 people are employed as agricultural labourers, 2,867 of them males and 3,174 of them women.

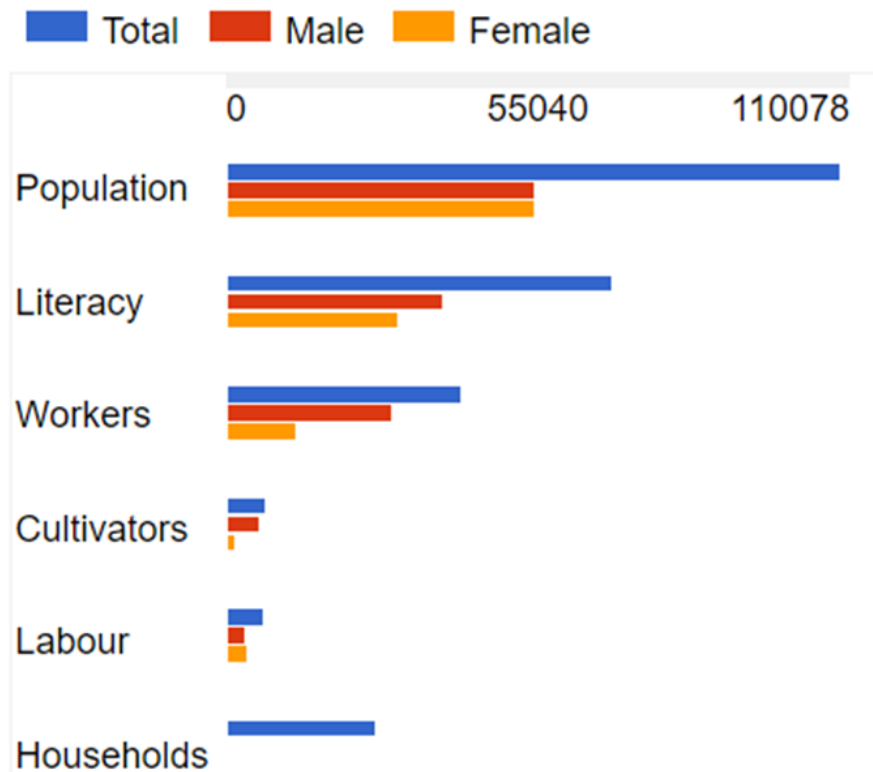


Figure: Barchart of Kagaz Nagar on population, literacy, workers and households

The Kagaz Nagar population chart is a graph that displays the distribution of all demographic categories. It reveals that 62.54 percent of the population is literate, with 34.85 percent of males and 27.69 percent of females being among those who are. A total of 37.85 percent of people are employed; of these, 26.63 percent are men and 11.22 percent are women. In Kagaz Nagar, the percentage of farmers engaged in Mandal Agriculture is 6.01 percent; of these, 4.98 percent are men and 1.03 percent are women. 5.49 percent of the population in Kagaz Nagar is employed, of whom 2.60 percent are men and 2.88 percent are women. There are equal numbers of male and female residents in Kagaz Nagar Mandal. The graph below displays Kagaz households from literacy to income.

Kagaznagar Mandal Data

Here are a few basic facts about Kagaznagar Mandal based on data from the 2011 Population Census.

Parameter	Total	Male	Female
Children (Age 0-6)	12,217	6,337	5,880
Literacy	70.35%	69.54%	55.52%
Scheduled Caste	16,613	8,224	8,389
Scheduled Tribe	4,642	2,279	2,363
Illiterate	41,232	16,806	24,426

Urban/Rural Population - Kagaznagar Mandal

According to the 2011 Census, there are 13,630 families living in rural regions and 13,630 families living in urban areas collectively within the Kagaznagar Mandal. As a result, urban regions are home to 52.3% of Kagaznagar Mandal's population, while rural areas are home to 47.7%. The number of children (0–6) in urban areas is 5,576 whereas it is 6,641 in rural areas.

Parameter	Total	Urban	Rural
Population	110,078	57,583	52,495
Children (0 - 6 years)	12,217	5,576	6,641

Schedule Caste	16,613	8,704	7,909
Schedule Tribe	4,642	718	3,924
Literacy	70.35%	80.51%	58.83%
Sex Ratio	995	1,010	980

Working Population - Kagaznagar Mandal

Out of the entire population in Kagaznagar Mandal, 41,666 people were working. While 23.7% of workers were engaged in marginal activity that provided a means of subsistence for less than six months, 76.3% of workers described their work as Main Work (employment or earning more than six months). Of the 41,666 people employed in Main Work, 6,617 (either as owners or co-owners) were cultivators, and 6,041 were agricultural labourers.

Parameter	Total	Male	Female
Main Workers	31,790	24,350	7,440
Cultivators	6,617	5,486	1,131
Agriculture Labourer	6,041	2,867	3,174
Household Industries	643	468	175
Other Workers	18,489	15,529	2,960
Marginal Workers	9,876	4,961	4,915
Non Working	68,412	25,857	42,555

The location for the establishment of the STI Hub in Kagaznagar Mandal has been chosen based on the demographic case study.

(c) Target Beneficiaries (type, total size of target group(s), % of ST of total population in project area etc, number of beneficiaries, % of ST of total beneficiaries)

Caste-wise Population - Kagaznagar Mandal

The Schedule Tribe (ST) were 4.2% of total population in Kagaznagar Mandal of Telangana.

	Total	Male	Female
Schedule Tribe	4,642	2,279	2,363

5. Baseline Data Capture

Kagaz Nagar is Mandal in Telangana state, Kagaz Nagar Mandal population in 2023 is 145,303. According to 2011 census of India, Total Kagaz Nagar population is 110,078 people are living in this Mandal, of which 55,168 are male and 54,910 are female. Kagaz Nagar population estimated to be 140,900 in 2022. Literate people are 68,846 out of 38,362 are male and 30,484 are female. Total workers are 41,666 depends on multi skills out of which 29,311 are men and 12,355 are women. Total 6,617 Cultivators are depended on agriculture farming out of 5,486 are cultivated by men and 1,131 are women. 6,041 people works in agricultural land as a labour in Kagaz Nagar, men are 2,867 and 3,174 are women.

Plucking cotton is the biggest problem for ST communities in the Adilabad district because of a lack of labor and knowledge. Lack of health facilities, Improper Pest in the fields of horticulture crops, Lots of wastage of inedible seeds, livelihood systems, and other factors like limited access to education, financial resources, markets, and technology.

Many of the farmers only had small plots of land, and cotton, rice, soyabeab, redgram

were the popular crops in Adilabad district. Cotton plucking, improper growth and low yield, medical facilities, and wastage of inedible seeds are the major problems they are facing. This conventional technique takes a very long time and produces a very small amount of product.

6. Analysis of Livelihood Systems

(a) Predominant Livelihoods in the target area (current major occupations of the community, present average annual income etc)

41,666 people in Kagaznagar Mandal were working out of the total population. While 23.7% of workers regard their work as marginal, providing a source of income for less than six months, 76.3% of workers identify their work as main (employment or earning longer than six months). Of the 41,666 people who were employed in the main work, 6,617 were cultivators (either owners or co-owners), and 6,041 were agricultural labourers.

(b) Predominant Livelihoods of ST community

The Schedule Tribe (ST) were 4.2% of total population in Kagaznagar Mandal of Telangana.

(c) Details of Livelihood Assets

Animal Husbandry is only second to agriculture in terms of contributing to the gross income and employment in the district. The live stock population of the district is Cattle (White) 8,61,422 2. Buffaloes 3,01,646 3. Sheep 5,83,936 4. Goats 3,28,297 5. Poultry 11,82,822.

The crop details has shown in below Table.

CROP	AREA IN HECTARES	OUT-TURN IN TONNES
Cotton	310363	723297
Rice	70745	187267
Soyabean	58771	84630
Redgram	40631	26817

Jowar	28792	35462
Maize	22020	68773
Bengalgram	17204	25341
Greengram	8076	5240

(d) Industrial milieu of the target area

Kagaznagar

It is a part of Telangana. It lies 123 kilometres east of the district headquarters in Adilabad. A Mandal headquarters are there. Kagaznagar's postal headquarters are at Sirsilk Colony, with the pin code 504296.

EXISTING TINY & SMALL SCALE INDUSTRIES

Sl. Category No.	No.of Units	Investment (Rs.in lakhs)	Employment No.s
1. Food & Agro-based Industries	657	3545.39	10474
2. Forest based Industries	128	138.21	8340
3. Mineral Based Industries	80	412.29	1579
4. Engineering & Allied Inds.	411	420.77	1879
5. Textile based industries	33	304.10	196
6. chemical based Industries	21	118.98	115
7. Building material & Ceramics Inds.	122	823.91	2958
8. Other Industries	491	285.04	1842
TOTAL	1943	6048.74	27,383

(e) Details of Existing Social/Rural Enterprises

The economics and sustainability of Dhal milling Units for Rural Entrepreneurship in tribal Areas of the Adilabad District in light of the sustainable development of Red gramme producers and the future food security of the tribal households. The production and productivity of red gramme, minimum support prices (MSP), market pricing for dhal, and dhal recovery percentage are the factors that have the greatest impact on the profitability of dhal milling enterprises.

(f) Socio-economic Status

Adilabad is referred to as the "city of cotton" since it produces a significant amount of cotton. At current rates, the district's gross domestic product in 2020–21 was Rs.

14,59,885 lakhs, compared to Rs. 9,65,645 lakhs in 2011–2012.

(g) Availability of Natural Resources & Raw Materials

In Adilabad, the availability of Agriculture, cropping pattern, irrigation, horticulture, Sericulture, Livestock, Dairy development activity, Sheep and Goat rearing, forest produce, Mineral Resources like, Coal, Limestone, White clay, manganese, Sand (Stowring).

(i) Access to Technologies

The Agriculture Department has implemented a number of initiatives to boost the growth rate of the sector, including soil health management under the National Mission on Sustainable Agriculture (NMSA), integrated farming systems under the Rural Agricultural Development (RAD) programme, comprehensive water management activities, including water management planning, and others. Implementing Integrated Nutrient Management (INM) and Integrated Pest Management (IPM), which are the topics of recurring field training and demonstrations, can reduce the cost of cultivation. The financial security of the district's farmers is a primary priority, thus initiatives like crop diversification for greater revenues and the enhancement of agricultural goods are also given top priority.

(j) Details of Indigenous Knowledge Systems

The excellence of Adilabad, the city of cotton, is found in the splendour of nature. Perhaps this beauty inspires the locals' creative instinct to develop lovely handicrafts. In fact, the Adilabad district's arts and crafts have helped put the county on the map of Indian handicrafts. The area is home to a wide variety of arts and crafts, including miniature paintings, intriguing wooden toys, antiques, and eco-friendly curios. In India's Adilabad district sits the town of Nirmal, which is known for its astoundingly gorgeous paintings, variety of handicrafts, and wooden toys. Another outlying settlement that gained notoriety for producing Dokhra crafts is Ushagham. This is a traditional style of art that was created by the indigenous people of the hamlet.

(k) Information on human capital of target beneficiaries.

Human capital is essential for encouraging learning, acquiring knowledge, forming connections, and generating a setting that supports social innovation. The discussion that follows focuses on the plans and tactics implemented to enhance Telangana's human resources and spirit of social innovation.

7. Problem Statement

Livelihood systems form the backbone of communities, providing individuals with the means to sustain their lives and support their families. However, these systems often face challenges and weaknesses that hinder growth and development. The main focus is on the weakest links, gaps, and problems within predominant livelihood systems and explore how the STI Hub can play a pivotal role in bridging these gaps and addressing the identified challenges.

- ❖ Lack of Access to Information and Resources
 - ❖ Inadequate Medical facilities and devices
 - ❖ Manual plucking needs more time consumption, wastage of cotton collection and increase in labor cost.
 - ❖ Conventional spraying of pesticides may not reach a high yield.
 - ❖ Wastages of non-edible seeds such as Japroha, Neem, Pongamia. etc.

8. Proposed Solution

Identifying and addressing the weakest links, gaps, and problems within predominant livelihood systems is crucial for sustainable development and economic empowerment. The STI Hub, through its integration of information technology, can play a transformative role in bridging these gaps and addressing the identified challenges. By providing access to information, training, markets, and financial services, the STI Hub empowers individuals to overcome conventional methods, enhance their skills, expand their businesses, and improve their livelihoods.

The training of trainers initiative in the program provides significant benefits to youth of weaker section peoples.

Short Term Solution/Goal:

- Awareness on IoT sensors for health checkup and tracking of various medical equipment.
- Awareness on Extraction of oil from Non-edible seeds by various Extraction and

filtration machines.

Medium Term Solution/Goal:

- Usage of Drones for various crops in order to control the Pests and improve the growth of plants.

Long Term Solution/Goal:

- Training on Robotic harvesting for plucking of cotton in a crop field.

They receive training in Data Analytics, Office Automation, and system administration to enhance their skills and knowledge in these areas.

It also covers how to securely convert, store, process, transfer, and retrieve information using electronic computers and computer software.

Through a holistic approach that leverages technology and innovation, the STI Hub contributes to building resilient and thriving livelihood systems that support the overall well-being and prosperity of communities.

9. Details of Proposed Interventions

Sl. No.	Interventions	Justification
a	<p>Incorporating information technology (IT) into health diagnostics in the medical field. The center is enabling local individuals to access digital health services, IoT-based Point of Care Devices (PoCD), and e-diagnostics.</p>	<p>Using IoT devices, patients without a physical presence in a healthcare facility can automatically gather health metrics, eliminating the need to travel and collect data themselves. These metrics include heart rate, blood pressure, temperature, and more.</p> <p>The real-time position of medical equipment like wheelchairs, defibrillators, nebulizers, oxygen pumps, and other monitoring equipment is tracked using IoT devices tagged with sensors. Real-time analysis can also be done of the placement of medical personnel at various sites.</p> <p>Sensors: IoT in healthcare has different sensors devices such as pulse-oximeter, electrocardiogram, thermometer, fluid level sensor, sphygmomanometer (blood pressure) that read the current patient situation (data).</p> <p>To ensure food and nutrition, livelihood, and social security for Scheduled Tribes (ST) in selected Gram Panchayats of Adhilabad District in Telangana.</p>
b	<p>Genetic engineering confers desirable results in higher yield potential, disease resistance, and uniformity.</p>	<p>Cotton Crop which are shorter, sturdier stems open more fully can be facilitated with robotic harvesting.</p> <p>The production of Hybrid maize varieties can be developed by crossbreeding different parent lines.</p>

c	<p>An Integrated Pest Management (IPM) practice optimizes the judicious use of biological, cultural, and chemical control measures to control pests effectively.</p>	<p>This method reduces the chemical usage and minimizes environmental impact and fosters sustainable pest control.</p> <p>This helps in reducing yield loss, decrease in use of pesticides which contributes to sustainable agriculture.</p> <p>Drones are regarded excellent tools for the quick, accurate, and non-destructive detection of field issues and can be used in practically all agricultural field operations.</p>
d	<p>Extraction of raw oil from the waste of Non-Edible Seeds located in the area of Adilabad District.</p>	<p>Oil can be extracted and filtration from non-edible seeds to help the manufacturing of cosmetics (soaps, body creams, hair products, etc.) and pharmaceuticals (allopathic and ayurvedic medications) with less waste, more efficiency, and lower production costs. Additionally, it improves hygiene, reduces harmful emissions and its effects on livelihood.</p>

e	Integrating skill development in IT specialized domains.	<p>The training of trainers initiative in the program provides significant benefits to youth of weaker section peoples.</p> <ul style="list-style-type: none"> ● Awareness on IoT sensors for health checkup and tracking of various medical equipment. ● Training on Robotic harvesting for plucking of cotton in a crop field. ● Operation of Drones for various crops in order to control the Pests and improve the growth of plants. ● Awareness on Extraction of oil from Non-edible seeds by various Extraction and filtration machines. <p>They receive training in Data Analytics, Office Automation, and system administration to enhance their skills and knowledge in these areas.</p> <p>It also covers the secure conversion, storing, processing, transmission, and retrieval of information through the use of electronic computers and computer software.</p>
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10. Nature of the project

Technology development (new technology, new product/process)	
Adaptive R&D (Location Specific Research & Technology Development including Technology modification/modulation/ optimization, up/down Scaling of existing systems, technology adaption/adoption etc)	
Technology transfer (field trials, demonstrations & transfer of technology)	√
Technology dissemination (Replication of successful models, deployment of new and available technologies for identified problem)	

11. Give the details of technologies proposed/to be proposed

Selected for transfer

12. Importance of the proposed Interventions (Technologies) in the context of current status

Health care:

1. Improved accuracy and efficiency: Incorporating information technology into health diagnostics can significantly enhance the accuracy and efficiency of medical assessments. IoT tools and systems can automate processes, streamline data analysis, and provide real-time insights, leading to faster and more precise diagnoses.

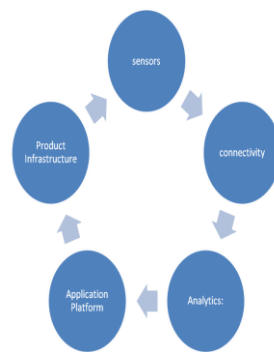


Figure. Process of IoT Health care System

2. Enhanced access to healthcare: By integrating IoT into health diagnostics, the proposed interventions can help overcome barriers related to geographical distance and limited healthcare resources. Remote diagnostic capabilities, telemedicine solutions, and digital health platforms can expand access to quality healthcare services, especially in underserved areas.

3. Early detection and preventive care: IoT-based sensors enable the development of advanced screening techniques and predictive analytics models. This facilitates early detection of diseases, empowering healthcare providers to initiate timely interventions and preventive measures. Ultimately, this can lead to better health outcomes, reduced healthcare costs, eliminating the need to travel and collect data themselves.

4. Nutritional well-being: The interventions focus on addressing nutritional challenges faced by Scheduled Tribes. By raising awareness about balanced diets, the proposed technologies contribute to improving the nutritional status and overall well-being of the community.

5. Data-driven decision-making: The integration of IoT in health diagnostics generates vast amounts of data that can be analyzed and leveraged for informed decision-making. Data analytics and machine learning algorithms can identify patterns, trends, and potential risk factors, assisting healthcare professionals in making accurate diagnoses and personalized treatment plans.

Genetic-based technologies

1. Cotton Harvesting: The interventions aim to ensure cotton harvesting among Scheduled Tribes by implementing improved agricultural methods and introducing relevant technologies. This helps increase cotton productivity, reduce the labor cost and time.

2. Livelihood diversification: The interventions offer opportunities for livelihood diversification among Scheduled Tribes. By introducing Cotton plucking technologies, such as improves productivity and it explore the alternative income sources, reduce dependency on a single livelihood, and improve their economic resilience.

Integrated Pest Management

1. Environmental benefits: Agricultural sprayer drones can also help reduce the environmental impact of farming. By using GPS technology to precisely target specific areas, these drones can help minimize the amount of chemicals that are applied to fields, reducing the risk of runoff and other environmental issues.
2. Smart Farm: The use drones for agriculture spraying, which helps limit human contact with fertilizers, pesticides and other harmful chemicals. Drones can handle this task faster and more efficiently than vehicles and airplanes; they are also a great alternative for farms that still use manual labor.

Oil Extraction Management

1. Production from renewable resources: The oil extraction from non-edible helps in increase of oil production, it also Creates Jobs and Gives the Economy a Boost. Additionally, it improves hygiene, reduces harmful emissions and its effects on livelihood.
2. Sustainable development: The interventions promote sustainable development by focusing on eco-friendly practices, natural resource conservation, and community

empowerment. By incorporating technologies that enable efficient use of resources, the proposed interventions support sustainable agriculture, protect the environment, and promote intergenerational equity.

Skill Development

1. **Digital transformation:** The integration of IoT skills enables individuals and organizations to embrace digital transformation. It equips them with the knowledge and capabilities to leverage technology effectively, automate processes, and enhance efficiency across various sectors, including Healthcare, Crop harvesting, Pesticides Spray and Extraction of oils from Wastage Seed.
2. **Meeting industry demands:** With the rapid advancement of technology, there is a growing demand for skilled professionals in the IoT specialized domain. By integrating skill development initiatives, the proposed interventions aim to bridge the skills gap and provide individuals with the expertise required to meet the evolving needs of the industry.
3. **Career opportunities and economic growth:** Skill development in the IoT specialized domain creates new career opportunities for individuals. By equipping them with the necessary skills, the interventions enable individuals to pursue lucrative careers in the technology sector, contributing to personal growth and economic prosperity.
4. **Innovation and entrepreneurship:** IT skills are essential for driving innovation and entrepreneurship. By fostering skill development in the IT specialized domain, the interventions empower individuals to develop innovative solutions, create technology-based startups, and contribute to the growth of the digital economy.

13. Science & Technology component/Innovativeness/Novelty of the project.

The unique perspective that adds to the existing knowledge in the Proposed Project as follows.

- Patients who are not physically present in a healthcare facility can automatically collect health measurements using smart IoT devices, obviating the requirement for them to travel and acquire their own data. Heart rate, blood pressure, temperature, and other measurements are among them.

The real-time position of medical equipment like wheelchairs, defibrillators, nebulizers, oxygen pumps, and other monitoring equipment is tracked using IoT devices tagged with sensors. Real-time analysis can also be done of the placement of medical personnel at various sites.

- When roughly 60% of the cotton bolls are open, the plants are routinely defoliated to speed up harvest and maximise fibre quality. The early-opening bolls expose their fibre to the elements until harvest, frequently for weeks, as a result of the non-uniform maturity, which lowers the quality of the fibre. High capacity harvesting equipment is also hefty, which may compact the soil, lowering hydraulic conductivity in the wheel tracks and decreasing yield.

Multiple harvests during the growing season are made possible by robotic harvesting with smaller equipment, and they also make it possible to pick seed cotton as soon as the boll opens, protecting fibre quality. Additionally, soil compaction would be less likely to occur with smaller machinery.

The novel features of robotic harvesting are Transferring & Doffing, Easy Penetration and Exit, Targeting, Boll Orientation, and Loose and Stretched out Picking.

- Crop health monitoring, which includes irrigation, fertilisation, pesticide application, and timely crop harvest, is one of the key elements of precision agriculture. Furthermore, monitoring crop health and making wise decisions to sustain it is essential given the continual changes in growth and development.

Drones are quite helpful in completing the task since they can quickly identify issues on the spot and take necessary action. Drones provide labour assistance and cut down on labour time and costs without any physical contact.

Drones are generally considered good instruments for quick, accurate, and non-destructive field problem detection and can be used in nearly all agricultural field operations.

- Oils derived from non-edible seeds of plants can be used to produce biofuels, to eliminate the competition between food and fuel.

Inedible seeds are abundantly available in rural areas and being wasted in Adilabad state of India. The collection of those in-edible seeds helps the biodiesel industry to overcome the scarcity of In-edible seeds.

14. Expected Deliverables

Enhanced Diagnostic Accuracy, Improved Efficiency and Speed, Increased Access to Healthcare, Cost-effectiveness

- Enhanced Technological Expertise, Increased Employability, Entrepreneurship and Innovation, Collaborative Problem-Solving, Digital Transformation.
- Improved Food Security, Enhanced Livelihood Opportunities, Enhanced Social Security, Improved Health and Nutrition, Empowerment and Community Participation, Sustainable Development and Environmental Conservation.
- Increased oil production, the generation of jobs, and economic expansion are all impacted by oil extraction from non-edible sources. Additionally, it improves hygiene, reduces hazardous emissions, and benefits livelihood.
- Skill developments creates the awareness among the weaker section peoples

15. Expected benefits to the target groups/population

The Schedule Tribe (ST) were 4.2% of total population in Kagaznagar Mandal which is located in Adilabad district of Telangana will provides significant benefits to youth of weaker section peoples.

- Awareness on IoT sensors for health checkup and tracking of various medical equipment and medicines.
- Robotic harvesting for plucking of cotton in a crop field.
- Usage of Drones for various crops in order to control the Pests and improve the growth of plants.
- The oil extraction from non-edible helps in increase of oil production, it also Creates Jobs and Gives the Economy a Boost. Additionally, it improves hygiene, reduces harmful emissions and its effects on livelihood.
- The development of skills raises awareness among those in the weaker sections of society.
- Organize digital literacy programs to educate ST community members on using smartphones, computers, and the internet. Promote e-governance services and awareness about government schemes that can benefit the community.

16. Suggested plan of action for utilization of the outcome expected from the project

Skill Development Training and Capacity Building Programmes

Programme Calendar

Month: 1

Week day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Date	01	02	03	04	05	06
Name of the Activity	Awareness and training on IoT sensors for health checkup and tracking of various medical equipment and medicines.					
Date	07	08	09	10	11	12
Name of the Activity	Training Program on Robotic harvesting for plucking of cotton in a crop field and its operation and maintenance.					
Date	13	14	15	16	17	18
Name of the Activity	Training Program on Integrated Pest Management in crops with usage of Drones for various crops and for improving the growth of plants.					
Date	19	20	21	22	23	24
Name of the Activity	Awareness & Training Program on collection on various wastage of non-edible seeds and mechanization of oil.					
<p>Total No. of Training programmes planned: 04</p> <p>Total No. of Trainees per programme: 100</p>						

17. Please give a detailed business plan/enterprise model/sustainability of the project.

18. Details of the beneficiaries (direct and indirect) (Own land / business)

S.No.	Direct Beneficiaries (80%)	In-Direct Beneficiaries (20%)	Total (100%)
1.	3700	942	4,642

19. Details of Collaborators

Sl. No.	Name and Address of the Collaborators	Purpose
1.	Malla Reddy Health City, X Roads, Sundar Rao Nagar, Suraram, Hyderabad, Telangana 500055	Incorporating information technology into health diagnostics can significantly enhance the accuracy and efficiency of medical assessments. Systems can automate processes, streamline data analysis, and provide real-time insights, leading to faster and more precise diagnoses.

20. Duration (months): 36 months

21. Budget Summary (in Rs): Rs. 3,02,53,110/-

Recurring Cost (in Rs): Rs. 1,89,76,640

Non-Recurring cost (in Rs): Rs. 1,12,76,470

<i>Sl. No</i>	<i>Item</i>	<i>Budget</i>			
		<i>1st Year</i>	<i>2nd Year</i>	<i>3rd Year</i>	<i>Total</i>
A	RECURRING				
1	Manpower	12,08,880	12,08,880	12,08,880	36,26,640
2	Consumables	20,50,000	10,00,000	5,00,000	35,50,000
3	Travel	4,50,000	3,50,000	4,50,000	12,50,000
4	Training Programs	15,00,000	15,00,000	15,00,000	45,00,000
5	Other Costs	5,00,000	3,00,000	2,50,000	10,50,000
6	Review Meeting by DST	3,50,000	3,00,000	3,00,000	9,50,000
7	Contingencies	12,50,000	12,50,000	12,50,000	37,50,000
8	Institutional Overheads	1,00,000	1,00,000	1,00,000	3,00,000
	Total (A)				Rs. 1,89,76,640
B	NON RECURRING				
1	Permanent Equipment	53,76,470	---	--	53,76,470
2	Fabrication of Equipment	12,00,000	2,00,000	--	14,00,000
3	Construction Costs	45,00,000	--	--	45,00,000
	Total (B)				Rs. 1,12,76,470
	Total (A+B)				Rs. 3,02,53,110/-

PART II: TECHNICAL DETAILS OF PROJECT

1. Introduction (under the following heads)

The Scheduled Tribes (ST) communities in many parts of India face significant socio-economic challenges, including limited access to resources, education, healthcare, and livelihood opportunities. This project aims to address these challenges facing ST communities. Development & delivery of technology to enhance their economic empowerment, social inclusion, and overall quality of ST communities by focusing on available natural resources.

- (a) Existing Natural Resource Endowment of the Target Area (to promote efficient and effective use of local and natural resources for improved livelihoods – give details of geographical area, climate, land use pattern & cropping patterns, availability of natural resources & raw materials etc.)

➤ Geographical Area



Figure: Telangana State



Figure: Adilabad district

The district comprises an area of 4,153 square kilometres (1,603 sq mi). with a density of population of 170 persons per sq.km . There are 508 villages exist in Adilabad district.

According to the Census of India, the residual Adilabad district has a population of 708,972, with a ratio of 989 females to 1000 males. 23.66% of the population lives in urban areas. The literacy rate is 63.46%. Scheduled Castes and Scheduled Tribes make up 99,422 (14.02%) and

224,622 (31.68%) of the population respectively.

➤ **Climate and Rainfall conditions in Adilabad**

The district's climate is characterised by a scorching summer and is often dry, with the exception of the south-west monsoon season. There are four seasons that make up the entire year. The summer season, which lasts from March to May, follows the winter season, which lasts from December to February. The south west monsoon season lasts from June to September, while October and November are considered the post monsoon season.

In the district, rainfall tends to rise from the south-west to the north-east. The south-west monsoon season is when most of the year's precipitation falls. The wettest month is July. The annual rainfall varies only slightly from year to year. The district experiences 1044.5mm of annual rainfall on average.

➤ **Soil in Adilabad**

Red and black soil are both found in Adilabad district though black soil predominates, accounting for almost 72% of the soil in the district. The mineral resources are mainly limestone and manganese ore.

❖ **Major Crops in Adilabad.**

CROP	AREA IN HECTARES	OUT-TURN IN TONNES
Cotton	310363	723297
Rice	70745	187267
Soyabean	58771	84630
Redgram	40631	26817
Jowar	28792	35462
Maize	22020	68773
Bengalgram	17204	25341
Greengram	8076	5240

(b) Demographic details and Socio-economic profile – as per 2011 census

Kagaz Nagar is a Town and Mandal in Adilabad district of Telangana state in India. Total number of villages in this Mandal is 38. Kagaz Nagar Mandal sex ratio is 995 females per 1000 of males.

Population of Kagaz Nagar

Population	Males	Females	Households
110,078	55,168	54,910	26,282

Table: Population of Kagaz Nagar

There will be 145,303 people living in the Telangana state Mandal of Kagaz Nagar in 2023. According to the 2011 Indian census, there are 110,078 people residing in Kagaz Nagar, of which 55,168 are men and 54,910 are women. In 2022, there will be 140,900 people living in Kagaz Nagar. Out of the 38,362 male and 30,484 female literate people, there are 68,846. A total of 41,666 workers rely on multiple skills, of which 29,311 are men and 12,355 are women. There are 6,617 cultivators who rely on agriculture, of which 5,486 are males and 1,131 are women. 6,041 individuals, 2,867 men and 3,174 women, work as agricultural labourers in Kagaz Nagar.

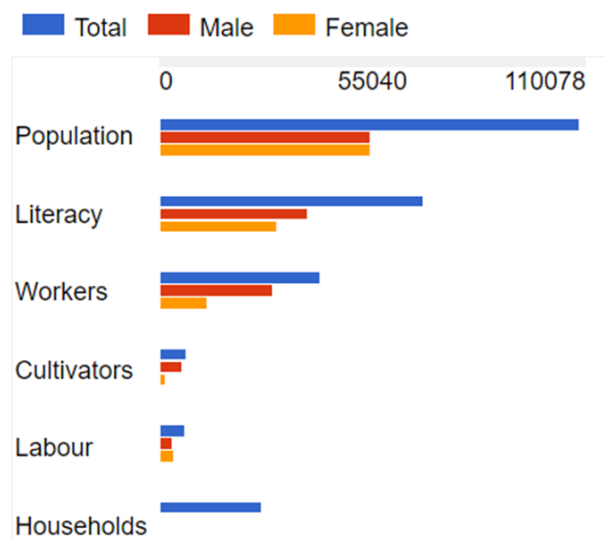


Figure: Barchart of Kagaz Nagar on population, literacy, workers and households

The Kagaz Nagar population chart is a graph that displays the distribution of all

demographic categories. The literacy rate is 62.54 percent, with males making up 34.85 percent of this group and females making up 27.69 percent. There are 37.85 percent of workers overall, of which 26.63 percent are men and 11.22 percent are women. 6.01 percent of Kagaz Nagar's population are farmers engaged in Mandal Agriculture, of whom 4.98 percent are men and 1.03 percent are women. 5.49 percent of people work in Kagaz Nagar, 2.60 percent of them are men and 2.88 percent of whom are women. The population of Kagaz Nagar Mandal is divided into male and female members. From Literacy to Kagaz households, the graph below displays information.

Kagaznagar Mandal Data

Here are a few basic facts about Kagaznagar Mandal based on data from the 2011 Population Census.

Parameter	Total	Male	Female
Children (Age 0-6)	12,217	6,337	5,880
Literacy	70.35%	69.54%	55.52%
Scheduled Caste	16,613	8,224	8,389
Scheduled Tribe	4,642	2,279	2,363
Illiterate	41,232	16,806	24,426

Urban/Rural Population - Kagaznagar Mandal

According to the 2011 Census, there are 13,630 families living in rural regions and 13,630 families living in urban areas collectively within the Kagaznagar Mandal. As a result,

urban regions are home to 52.3% of Kagaznagar Mandal's population, while rural areas are home to 47.7%. The number of children (0–6) in urban areas is 5,576 whereas it is 6,641 in rural areas.

Parameter	Total	Urban	Rural
Population	110,078	57,583	52,495
Children (0 - 6 years)	12,217	5,576	6,641
Schedule Caste	16,613	8,704	7,909
Schedule Tribe	4,642	718	3,924
Literacy	70.35%	80.51%	58.83%
Sex Ratio	995	1,010	980

Working Population - Kagaznagar Mandal

Parameter	Total	Male	Female
Main Workers	31,790	24,350	7,440
Cultivators	6,617	5,486	1,131
Agriculture Labourer	6,041	2,867	3,174
Household Industries	643	468	175
Other Workers	18,489	15,529	2,960
Marginal Workers	9,876	4,961	4,915
Non Working	68,412	25,857	42,555

The location for the establishment of the STI Hub in Kagaznagar Mandal has been chosen based on the demographic case study.

Caste-wise Population - Kagaznagar Mandal

The Schedule Tribe (ST) were 4.2% of total population in Kagaznagar Mandal of Telangana.

	Total	Male	Female
Schedule Tribe	4,642	2,279	2,363

(c) Brief Industrial Scenario of the target area (may refer to Industrial Profile of Districts by MSME)

S.No.	District Name	Total Udyog Aadhar	Micro	Small	Medium
1.	Adilabad	4563	3160	1383	20

(d) Indigenous Knowledge (IK)/Traditional Knowledge (TK), Skill and Practices and the problems identified (Community Knowledge and availability of IK skills/TK skills, Details of existing special skills/trades, including art, craft etc. of the target population)

41,666 people in Kagaznagar Mandal were working out of the total population. While 23.7% of workers regard their work as marginal, providing a source of income for less than six months, 76.3% of workers identify their work as main (employment or earning longer than six months). Of the 41,666 people employed in Main Work, 6,617 were cultivators (either co-owners or owners), and 6,041 were agricultural labourers.

(e) Details of the project implementation site/ Location map of the target area (as far as possible should be in the vicinity of the targeted population).

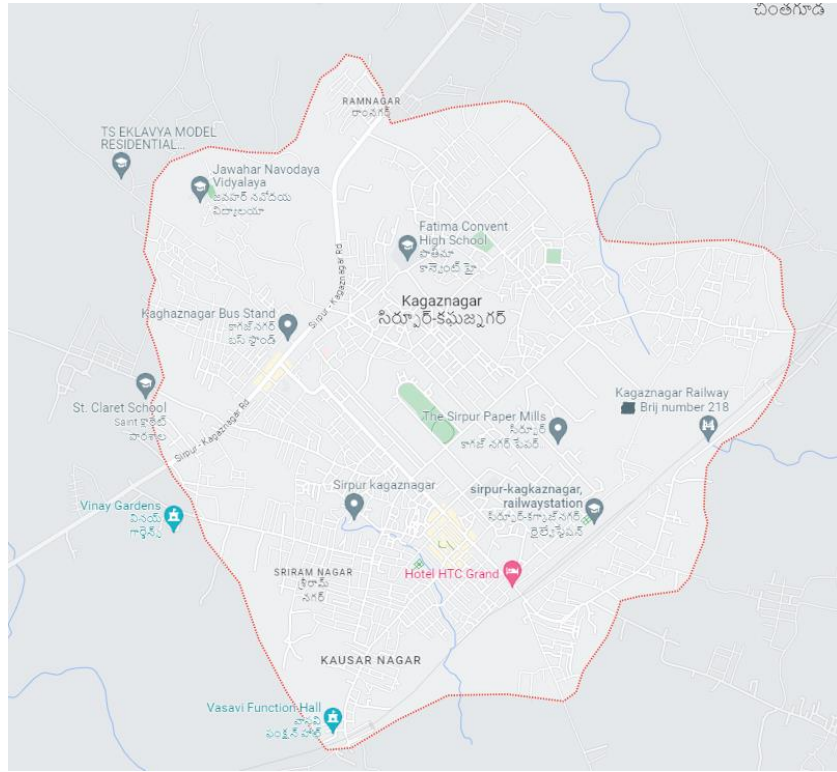


Figure: Kagaz Nagar Demography

The Schedule Tribe (ST) were 4.2% of total population in Kagaznagar Mandal of Telangana.

(f) Expertise available with proposed investigating group/institution for implementing the project.

S.No	Name of the Expert Person	Designation & Address
1	Dr. A. Ramaswami Reddy	Principal, Malla Reddy Engineering College, Hyderabad
2	Dr. S. Udaya Bhaskar	Professor, Malla Reddy Engineering College, Hyderabad
3	Dr. Raja Reddy Duvvuru	Associate Professor, Malla Reddy Engineering College, Hyderabad
4	Dr. M. Vijay Kumar	Associate Professor, Malla Reddy Engineering College, Hyderabad
5	Dr. J. Anitha	Professor, Malla Reddy Engineering College, Hyderabad
6	Dr. Deena Babu Mandru	Professor, Malla Reddy Engineering College, Hyderabad

2. Objectives

Identify the specific challenges faced by ST communities in their livelihood systems, including factors such as limited access to education, financial resources, markets, and technological advancements.

- ✓ To Enhance Health Diagnostics through IoT sensors for health checkup and tracking of various medical equipment and medicines.
- ✓ To facilitate cotton harvest and maximize fiber quality by the use of autonomous Robotic technology.
- ✓ The implementation of Smart Drone technology will improve the high yield of the crop with excellent tools for rapid, reliable, and non-destructive detection of field problems that will ensure food and nutrition security, create sustainable livelihood opportunities, improve social security.
- ✓ To transform the waste raw oils from inedible seeds for Power Plant Industries which ensure the livelihood opportunities.
- ✓ Explore and develop novel and innovative technologies that can be customized to suit the unique needs and requirements of ST communities and creating a e-commerce platform to get minimum support price (MSP) of their crop.

3. Interventions (Technologies) selected for development and/or dissemination, deployment, delivery along with justification: -NA-

4. Methodology and Work Plan

Methodology:

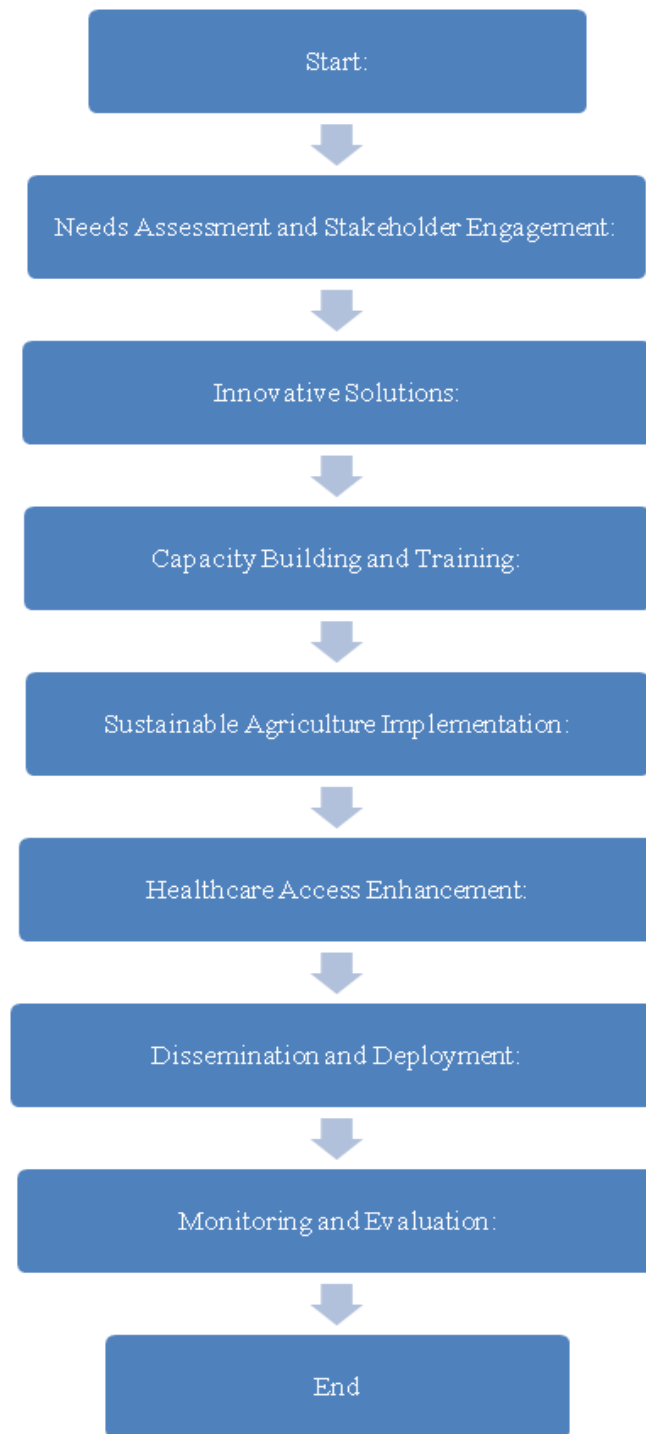


Figure: Process of Methodology

1. Needs Assessment and Stakeholder Engagement:

Conduct a comprehensive needs assessment by engaging with ST community members, local leaders, NGOs, and government representatives.

Identify specific challenges faced by the ST community related to livelihoods,

healthcare, and infrastructure.

Establish a collaborative approach by involving stakeholders in the decision-making process.

2. Innovative Solutions:

Establish an STI (Science, Technology, and Innovation) Hub, comprising experts, researchers, and technologists from diverse fields.

Conduct research to identify and develop innovative solutions tailored to the unique needs of the ST community.

Focus on technologies that are scalable, sustainable, and suitable for the target peoples.

3. Capacity Building and Training:

Design and deliver specialized training programs for ST community members on using and maintaining the newly developed technologies.

Organize workshops and skill development sessions to build capacity in areas like agricultural practices, digital literacy, and entrepreneurship.

4. Sustainable Agriculture Implementation:

Pilot sustainable agriculture practices, including organic farming, pest spraying, precision agriculture, selected farmlands within the ST community.

Monitor and evaluate the impact of these practices on crop yield, income generation, and environmental sustainability.

5. Healthcare Access Enhancement:

Develop and deploy smart health applications and telemedicine platforms to improve healthcare accessibility in remote ST regions.

Train healthcare workers in using telemedicine tools and provide essential medical equipment for remote consultations.

6. Dissemination and Deployment:

Organize workshops, seminars, and awareness campaigns to disseminate project outcomes and innovative solutions to a target people.

Collaborate with local media and community networks to amplify the project's impact and reach.

7. Monitoring and Evaluation:

Set up a robust monitoring and evaluation framework to track the progress of project activities.

Regularly assess the effectiveness of implemented technologies and interventions, and make necessary adjustments based on feedback and results.

Innovative Approach and Technical Methodology:

The innovative approach of the project lies in its focus on developing context-specific technologies and solutions, taking into account the socio-cultural aspects of the ST community. By establishing an STI Hub, the project can harness the expertise of diverse professionals and engage in collaborative research and development to ensure holistic solutions.

The technical methodology involves the following:

1. **Participatory Design:** Involve the ST community at every stage, from needs assessment to technology development, ensuring that the solutions align with their needs and preferences.
2. **Co-creation Workshops:** Organize workshops where community members actively contribute ideas and feedback to shape the development of innovative technologies.
3. **Prototyping and Testing:** Develop prototypes of the proposed technologies and conduct rigorous testing in real-world conditions to ensure their practicality and effectiveness.
4. **Data-driven Decision Making:** Utilize data analytics to evaluate the impact of implemented technologies and interventions, making data-driven decisions for continuous

improvement.

5. Sustainable Practices: Prioritize the integration of sustainable practices, such as renewable energy usage, waste reduction, and eco-friendly manufacturing techniques, to promote environmental responsibility.

6. Training and Capacity Building: Focus on building the capacity of the ST community to independently operate and maintain the technologies, ensuring long-term sustainability.

7. Knowledge Transfer: Facilitate knowledge transfer and technology dissemination through training programs, awareness campaigns, and open-access resources.

Relation between Project Objectives and Activities:

Research and development activities align with the objective of identifying innovative solutions to address ST community challenges.

Capacity building and training support the empowerment of the ST community and contribute to improved livelihoods.

Sustainable agriculture implementation directly relates to the objective of enhancing agriculture productivity and income generation.

Healthcare access enhancement directly contributes to the objective of improving healthcare accessibility for the ST community.

Digital empowerment activities align with the objective of fostering digital literacy and connecting the ST community to the digital world.

Dissemination and deployment activities aim to share the project's outcomes, promoting replicability and scaling up for future projects.

By adopting this methodology and innovative approach, the project endeavors to achieve its objectives of uplifting the livelihoods of the ST community through technology-driven solutions and inclusive development.

(c) Organization of work elements

Sl. No	Component/Work Elements	Expected Start (Month/Year)	Expected Completion (Month/Year)	Deliverables
1.	Awareness on IoT sensors for health checkup and tracking of various medical equipment and medicines.	01/2024	06/2024	The integration of IoT in health diagnostics generates vast amounts of data that can be analyzed and leveraged for informed decision-making. Data analytics and machine learning algorithms can identify patterns, trends, and potential risk factors, assisting healthcare professionals in making accurate diagnoses and personalized treatment plans.
2.	Robotic harvesting for plucking of cotton in a crop field.	07/2024	12/2024	The interventions offer opportunities for livelihood diversification among Scheduled Tribes. By introducing Cotton plucking technologies, such as improves productivity and it explore the alternative income sources, reduce dependency on a single livelihood, and improve their economic resilience.

3.	Usage of Drones for various crops in order to control the Pests and improve the growth of plants.	01/2025	06/2025	The use drones for agriculture spraying, which helps limit human contact with fertilizers, pesticides and other harmful chemicals. Drones can handle this task faster and more efficiently than vehicles and airplanes; they are also a great alternative for farms that still use manual labor.
4.	The oil extraction from non-edible helps in increase of oil production, it also Creates Jobs and Gives the Economy a Boost. Additionally, it improves hygiene, reduces harmful emissions and its effects on livelihood.	07/2025	12/2025	The interventions promote sustainable development by focusing on eco-friendly practices, natural resource conservation, and community empowerment. By incorporating technologies that enable efficient use of resources, the proposed interventions support sustainable agriculture, protect the environment, and promote intergenerational equity.
5.	The development of skills raises awareness among those in the weaker sections of society.	01/2023	12/2025	Organize digital literacy programs to educate ST community members on using smartphones, computers, and the internet. Promote e-governance services and awareness about government schemes that can benefit the community.

5. Details/Mechanism for the involvement of ST Population in the project.

(i) Recipients from different fields were selected for the intended ST (Scheduled Tribes) benefits, with careful consideration given to their economic standing. To ensure a comprehensive process, multiple meetings were conducted for each sector. Internal meetings were held with project employees associated with specific sectors, while external meetings involved the local Sarpanch, professionals, and stakeholders such as representatives from Self-Help Groups (SHGs), local governing bodies, businesses, and promoters, among others.

The selection process for recipients in various industries took into account their economic background. This approach not only benefits individual recipients but also contributes to the overall enhancement of the value chain. To ensure ongoing progress and transparency, routine follow-ups will be conducted to keep all project participants informed about the project's advancements.

(ii) Consultation with Local Governing Bodies (Panchayats):

The project team engaged in discussions with the sarpanch from each of the five villages to address STI Hub's role in creating a conducive environment for the economic and social progress of SC/ST populations. The sarpanches shared valuable insights into the challenges faced by their respective villages and pledged unwavering support to anyone in need.

(iii) Technical Support from Knowledge Institutions/Research Labs:

1. The EPICS initiative (Engineering Projects in Community Service) played a pivotal role in identifying the issues confronted by the ST community, which were briefly discussed.

2. The importance of empowering ST communities with advanced tools and providing assistance in developing sustainable solutions to their economic challenges was also highlighted during the discussion.

6. Indicate whether the project will help in maintaining environmental/ecological balances (if applicable).

Human development and material (economic) development are interdependent sectors that must be fostered simultaneously to ensure the overall progress of rural areas. The key elements in these areas are as follows:

(i) Conservation/Ecological Benefits:

To achieve this, it is crucial to attract private capital into the irrigation sector, which is currently predominantly funded by government agencies. Diversification of farming to include animals and high-value crops is essential. Simplifying institutional structures like contract farming, producer organizations, and cooperatives will aid in this process. Improving farmers' access to markets, helping them hedge against price fluctuations, and reducing their marketing and transaction costs are vital for ensuring equitable benefits from economic growth. Additionally, investing in precision farming will optimize resource utilization.

(ii) Physical/Health Benefits:

Agricultural tasks such as plowing, pesticide spraying, weeding, and harvesting are labor-intensive and expensive due to a lack of available labor and rising labor costs. To address this, providing cost-effective mechanized equipment for these tasks can prevent farmers from leaving rural areas in search of better opportunities in cities, thus stimulating farming activities.

(iii) Economical Benefits:

Generating income directly for SC communities, Self Help Groups, Government Agencies, and NGOs through agricultural extension services like market links, weather advisory services, and organic certification is crucial. These revenue streams can help the proposed STI Hub become self-sustaining even after the DST funding ends. Smart and automated technology will empower and lower labor costs, contributing to economic growth.

(iv) Social Benefits:

The STI Hub supports various national projects like Make in India, Digital India, Skill India, and Skill Development Initiative through technical interventions. Funding for educational and outreach projects, including capacity development for ST communities and prevention of youth dropout, comes from both public and private sources. Technology and solutions developed by STI Hub are disseminated to ST communities through

governmental and non-governmental organizations, fostering social development and providing royalties in return.

By focusing on these key elements, rural areas can progress holistically, experiencing both human and economic development, and thereby advancing toward comprehensive growth.

7. Give a brief description of the social and economic impact the project will create in the livelihood system of target beneficiaries and whether the STI Hub addresses the issues of Multidimensional Poverty.

The project implemented by the STI (Science, Technology, and Innovation) Hub aims to create significant social and economic impacts in the livelihood systems of its target beneficiaries, primarily Scheduled Tribes (ST) communities. The initiative has a multi-faceted approach that addresses various aspects of their lives, contributing to poverty reduction and overall development.

Social Impact:

1. Empowerment: The STI Hub empowers ST communities by providing access to cutting-edge technology and knowledge. This empowerment enables them to make informed decisions and participate actively in economic activities.
2. Capacity Building: Through educational and outreach programs, the project enhances the skills and capabilities of individuals within the ST communities. This, in turn, improves their employability and income-generating opportunities.
3. Inclusivity: By focusing on market links and lowering transaction costs for farmers, the project ensures that all members of the society benefit from economic expansion. This inclusivity contributes to social cohesion and reduced disparities.

Economic Impact:

1. Livelihood Diversification: The project promotes diversified farming practices by incorporating animals and high-value crops. This helps to reduce dependency on traditional, low-income sources and enhances the potential for increased earnings.
2. Employment Generation: The introduction of mechanized equipment and precision farming techniques increases agricultural efficiency, leading to higher productivity. This,

in turn, generates more employment opportunities for the ST communities in the agricultural sector.

3. **Self-Sustainability:** The focus on generating income from various sources, such as agricultural extension services and royalties, enables the STI Hub to become self-sustaining. This sustainability ensures the project's continuity and long-term impact.

Addressing Multidimensional Poverty:

The STI Hub's comprehensive approach, which includes empowering the ST communities with technology, education, and skill development, directly targets the various dimensions of poverty. By enhancing education and skills, increasing income opportunities, and promoting access to resources, the project addresses the root causes of poverty and creates a pathway for sustainable development. Moreover, the inclusivity and market-oriented strategies ensure that the benefits of economic growth are distributed equitably, further tackling multidimensional poverty.

8. Details of self-employment/revenue generation through the project in long term/development of entrepreneurship

In Adilabad, entrepreneurship is crucial for economic development and for enhancing peoples' quality of life by creating job possibilities. A company's performance is impacted by entrepreneurial activities since they bring new products, new processes, productivity, and market competitiveness.

9. Comment on the possibilities of the activity becoming self-sustainable / marketing / buy back arrangements /Micro Enterprise Development etc

The government of India has launched several impactful programs like Make in India, Digital India, Skill India, and the Skill Development Initiative, all of which are reinforced by technology interventions. STI Hub's educational and outreach projects, aimed at assisting ST communities and rehabilitating school dropouts, receive support from both government and non-government organizations. Rather than merely giving away its innovations, STI Hub distributes them through various governmental and non-governmental channels, while also collecting royalties. This approach benefits ST communities, self-help groups, government agencies, and NGOs, providing them access to valuable agricultural extension services, including market linkages, weather advisory services, and organic certification systems.

These revenue-generating initiatives enable the STI Hub to operate independently of DST funding. To ensure sustainable growth, private sector investment in the irrigation sector is crucial, as it is currently primarily funded by the public sector. The project promotes agricultural diversification by incorporating cattle and high-value crops. Supporting institutional arrangements such as cooperatives, producer organizations, and contract farming plays a vital role in fostering equitable growth. Simplifying farmers' access to markets, mitigating pricing risks, and reducing marketing and transaction costs are essential steps to ensure fairness.

Resource efficiency is emphasized through precision farming practices, which optimize resource utilization and enhance overall agricultural productivity. The combination of these efforts aims to create a positive impact on rural livelihoods and foster sustainable development in the target communities.

10. Details of Trainings and STI Capacity Building Programmes

- a. Training and Awareness Programme for STI Capacity Building etc.
- b. Training and Awareness Programme for demonstration, dissemination and deployment of selected technologies.

The primary objective of the ST&I Hub model is to establish a facility-based Incubator that facilitates various technological interventions. This concept aims to accelerate the development of successful entrepreneurial stakeholders by offering a diverse range of startup-support services and resources to the intended recipients. Through this ST&I Hub model, the focus is on providing training and support to foster the growth of successful startups or enterprises.

The ultimate aim is to enable these entities to become self-sufficient and financially sustainable in the long run, benefiting the target beneficiaries. By nurturing such startups and enterprises, the model generates employment opportunities, contributes to regional economic growth, and gives rise to marketable innovations. This paradigm serves as a catalyst for positive socio-economic development, fostering a thriving ecosystem of innovative ventures and contributing to overall progress.

11. Parameters to be used for evaluation of the impact

Pre Intervention (Bench Mark)	Anticipated Outcome (likely deliverables)
Technologies that can be transferred	Increase in Agricultural (crop/livestock/poultry/fisheries) Productivity
Technologies that can be commercialized	Increased availability of resources (natural and/or physical) and assets
Reports/Manuals that can be generated	Increase in livelihood/ employment opportunities in different areas (list the areas/field and give the number of entrepreneurs)
Patents (<i>applied/granted</i>) if any [expected to be generated]	New Enterprises to be developed (<i>mention the enterprises</i>)
Paper published, if any Popular articles, awareness leaflets, pamphlets developed and published	

12. Linkages/Collaborations with R&D institutions/S&T Based Knowledge Institutions (NGOs) etc.

Name of Organization	Role in project implementation
CMRCET, Kandlakoya	STI-HUB
Khadi Gram, Hyderabad	Cloth

13. Details on likely impact of the Project.

The project implemented by the ST&I Hub is expected to have several significant impacts on various aspects of the targeted beneficiaries and the broader community. Some of the likely impacts are as follows:

1. Economic Impact: The project's focus on supporting startups and enterprises is expected to generate new employment opportunities within the target communities. As

successful ventures grow and expand, they create job opportunities, thereby contributing to a reduction in unemployment and poverty levels. The startups and enterprises that become financially sustainable will also contribute to the local and regional economy, promoting economic growth and development.

2. **Technological Advancements:** By providing technological interventions and resources, the project is likely to spur technological advancements and innovations within the target communities. The startups and enterprises supported by the ST&I Hub will be encouraged to develop marketable innovations that address local challenges and have the potential for wider applicability.

3. **Entrepreneurship and Skill Development:** The project's Incubator model fosters entrepreneurship by providing startup-support services and training. This approach is likely to nurture a culture of entrepreneurship within the communities, empowering individuals with the skills and knowledge needed to create and run successful ventures.

4. **Self-sufficiency and Sustainability:** A key goal of the project is to enable the supported startups and enterprises to become self-sufficient and financially sustainable in the long term. This self-sufficiency will lead to greater resilience and independence, reducing dependency on external funding sources.

5. **Socio-economic Empowerment:** As successful startups and enterprises emerge from the project, there will be a positive impact on the socio-economic status of the target beneficiaries. The increased income and economic opportunities will contribute to improved living standards, better access to education and healthcare, and an overall enhancement of the quality of life.

6. **Market Linkages:** The project's support in facilitating market linkages will enhance the visibility and reach of the startups' products and services. This, in turn, will open up opportunities for growth and expansion, allowing the ventures to tap into larger markets beyond their immediate communities.

7. Collaborative Partnerships: The project's engagement with various governmental and non-governmental organizations, as well as the private sector, fosters collaborative partnerships. These partnerships can lead to knowledge-sharing, resource pooling, and increased support for the startups and enterprises, amplifying the project's impact.

Overall, the likely impact of the ST&I Hub project encompasses economic growth, technological advancements, enhanced entrepreneurship, and socio-economic empowerment. By nurturing startups and enterprises, the project creates a sustainable and positive ecosystem that benefits both the target beneficiaries and the broader community.

14. Details of ongoing/completed projects of the investigator(s) during the last 5 years

Sl. No.	Name of the project and Reference No	Funding Agency/Division	Cost & Duration	Status
1	Impact of Artificial Intelligence in the field of Agriculture & AICTE/1650613785	AICTE- ATAL FDP	Rs. 3,00,000/- & 2 weeks	Completed
2	Margarashan Initiative F.No.58-40/Margarashan Cell/Margarashan/2020-21	AICTE	10,00,000/- 1 Year	On - going
3	Student club under the scheme for Promoting Interests, Creativity and Ethics among Students (SPICES) F/IDC/SPICES/2020-21	AICTE	1,00,000/- 1 Year	Completed

4	A Smart Agriculture Application Development for Monitoring the Fields Using IoT and AI & AI4E-2259-T5L7-21100407	Microsoft AI for Earth	Rs. 1,00,00,000/- & 3 Years	On-going
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15. Details of ongoing/completed projects of the Institute during the last 5 years

Sl. No.	Name of the project and Reference No	Funding Agency/Division	Cost & Duration	Status
1	Impact of Artificial Intelligence in the field of Agriculture & AICTE/1650613785	AICTE- ATAL FDP	Rs. 3,00,000/-	Completed
2	Student club under the scheme for Promoting Interests, Creativity and Ethics among Students (SPICES) & File No: 10-73/AICTE/IDC/SPICES/2020-21	AICTE	Rs. 3,00,000/- & 1 Year	Completed
3	Advanced Training Program on Teaching & ISTE/AICTE-ISTE FDP/1-3513716560/2018-19	AICTE	Rs. 3,00,000/- & 1 week	Completed
4	Finite Element Analysis using ABAQUS & Ref . N o. 3 4-66 / 67 / F DCISTTP/ P o I i cv -L / 2oI9 -20	AICTE-STTP	Rs. 3,15,000/- & 3 week	Completed
5	Teaching-Pedagogical Intelligence & Ref. No. 3+-67 /1.12/FDC/FDp/p- r/201.s_20	AICTE, FDP	Rs. 4,34,000/- & 6 months	Completed

6	Solar Desalination for Nano and Micro Hierarchical Structures & Procs No.JNTUH/TEQIP-III/CRS/2019/MECH/01	JNTU-Hyderabad	Rs. 2,85,000/- & 1 year	Completed
7	Software defined Radio Lab & F.No.9-204/RIFD/MODROB/POLICY-1/2017-18	AICTE-MODROB	Rs. 12,71,000/- & 2 year	Completed
8	Big Data Analytics using R, Hadoop and Spark & F.No.34-55/223/RIFD/FDP/POLICY-1/2017-18	AICTE-FDP	Rs. 3,90,000/- & 1 year	Completed
9	Research Methodology in Engineering and Technical writing using LaTeX & F.No.34-56/70/RIFD/STTP/POLICY-1/2017-18	AICTE-STTP	Rs. 2,92,000/- & 1 year	Completed
10	LabVIEW for Measurement and Data Analysis & F.No.34-56/109/RIFD/STTP/ POLICY-1/2017-18	AICTE-STTP	Rs. 2,73,000/- & 1 year	Completed
11	Recent Trends in Mineral Exploration & Lr NoCRP/HRD/695/II/2295	SCCL	Rs. 25,000/- & 2 Day	Completed
12	Recent Trends in Mineral Exploration	Mining Engineer's Association of India	Rs. 50,000/- & 2 Day	Completed
13	Engineering Drawing - An Effective Teaching Methodology & ISTE/AICTE-ISTE Induction/Refresher Program/2018	AICTE-STTP	Rs. 3,00,000/- & 6 Day	Completed
14	Unnat Bharat Abhiyaan & D.O. No. 5-1/2016-UBA	UBA	Rs. 3,00,000/- & 2 years	Completed

15	Modernization of Microwave Engineering lab & F.No.9- I 97 IIDCIMODROB/Policy- 12019-20	AICTE, MODROB	Rs. 5,59,216/- & 2 years	On - going
16	Research laboratory for power quality analysis and enrichment & File No. B-214IR.IFD,/RPS {POLICY-1)/2078	AICTE-RPS	Rs. 9,10,980/- & 3 years	Completed
17	PERFORMANCE AND VIBRATION CHARACTERISATTON of Rubber seed oil Methyl Ester(RSME) Bio-Diesel BASED VCR ENGINE MOUNTED ON AI6051-SIC- RUBBER MOUNTS & File No. 8-38/FDclRPs (POTtcY-1) 120L9-20	AICTE-RPS	Rs. 11,90,196/- & 3 years	On - going
18	Margdashaan Initiative & F.No. 5B-41 /Margdarshak Cell/2020 -21	AICTE	Rs. 50,00,000/- & 3 Years	On-going
19	A Smart Agriculture Application Development for Monitoring the Fields Using IoT and AI & AI4E-2259-T5L7-21100407	Microsoft AI for Earth	Rs. 1,00,00,000/- & 3 Years	On-going
20	Skill and Personality Development Programme Center for SC/ ST Students SPDC & F; Ilo. 65.26/IDC/SPDC/POLIC- 1/2019-20	AICTE-SPDC	Rs. 15,13,400/- & 3 Years	On-going

21	Design and Development of Electrocoagulation unit for the processing of Electroplating waste water & F.No.8-23/FDC/RPS/POLICY-1/2021-22	AICTE-RPS	Rs. 17,50,000/- & 3 Years	On-going
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PART III: BUDGET

BUDGET ESTIMATES – SUMMARY*

<i>Sl. No</i>	<i>Item</i>	<i>Budget</i>			
		<i>1st Year</i>	<i>2nd Year</i>	<i>3rd Year</i>	<i>Total</i>
A	RECURRING				
1	Manpower	12,08,880	12,08,880	12,08,880	36,26,640
2	Consumables	20,50,000	10,00,000	5,00,000	35,50,000
3	Travel	4,50,000	3,50,000	4,50,000	12,50,000
4	Training Programs	15,00,000	15,00,000	15,00,000	45,00,000
5	Other Costs	5,00,000	3,00,000	2,50,000	10,50,000
6	Review Meeting by DST	3,50,000	3,00,000	3,00,000	9,50,000
7	Contingencies	12,50,000	12,50,000	12,50,000	37,50,000
8	Institutional Overheads	1,00,000	1,00,000	1,00,000	3,00,000
	Total				1,89,76,640
B	NON RECURRING				
1	Permanent Equipment	53,76,470	---	--	53,76,470
2	Fabrication of Equipment	12,00,000	2,00,000	--	14,00,000
3	Construction Costs	45,00,000	--	--	45,00,000
	TOTAL	1,10,76,470	2,00,000		1,12,76,470

System Configuration:

Dell Alienware Aurora (R13) Desktop, Intel i7-12700KF

16GB, 1 TB, 512 GB, SSD , NVIDIA RTX 3070 (8GB GDDR6 LHR)

Windows 11 , silver, 16.5 kgs (D269920WIN9)

MRP: Rs 4,57,647 ----- X10 = 45,76,470 +8L

Printer, Projector, Smart TV, Computer Tables and Chairs

A. RECURRING

1. BUDGET FOR MANPOWER

<i>Sl. No.</i>	<i>Designation</i>	<i>Budget (Rs)</i>			
		<i>1st Year</i>	<i>2nd Year</i>	<i>3rd Year</i>	<i>Total</i>
1.	Project Associate I (2 No's) Rs. 31,000/ month + 27 % HRA =Rs.39,370/-	9, 44,880	9, 44,880	9, 44,880	28,34,640
2.	Project Assistant (22,000 per month)	2,64,000	2,64,000	2,64,000	7,92,000
<i>TOTAL</i>		<i>12,08,880</i>	<i>12,08,880</i>	<i>12,08,880</i>	<i>36,26,640</i>

2. BUDGET FOR CONSUMABLES

<i>Sl. No</i>	<i>Consumables</i>	<i>Budget (Rs)</i>			
		<i>1st Year</i>	<i>2nd Year</i>	<i>3rd Year</i>	<i>Total</i>
1.		20,50,000	10,00,000	5,00,000	35,50,000
<i>TOTAL</i>		<i>20,50,000</i>	<i>10,00,000</i>	<i>5,00,000</i>	<i>35,50,000</i>

3. BUDGET FOR TRAVEL

<i>Sl. No</i>	<i>Purpose</i>	<i>Budget</i>			
		<i>1st Year</i>	<i>2nd Year</i>	<i>3rd Year</i>	<i>Total</i>
1.	Project Logistics	1,00,000	50,000	50,000	2,00,000
2.	Field Activities	3,50,000	3,00,000	4,00,000	10,50,000
<i>TOTAL</i>		<i>4,50,000</i>	<i>3,50,000</i>	<i>4,50,000</i>	<i>12,50,000</i>

4. BUDGET FOR TRAININGS

<i>Sl. No</i>	<i>Description of Trainings/Awareness</i>	<i>Budget</i>			
		<i>1st Year</i>	<i>2nd Year</i>	<i>3rd Year</i>	<i>Total</i>
1.	Training for Aspirants	15,00,000	15,00,000	15,00,000	45,00,000
<i>TOTAL</i>		<i>15,00,000</i>	<i>15,00,000</i>	<i>15,00,000</i>	<i>45,00,000</i>

5. BUDGET FOR OTHER COSTS

<i>Sl. No</i>	<i>Item</i>	<i>Budget</i>			
		<i>1st Year</i>	<i>2nd Year</i>	<i>3rd Year</i>	<i>Total</i>
1.	Field visits, Publication charges.	5,00,000	3,00,000	2,50,000	10,50,000
TOTAL		5,00,000	3,00,000	2,50,000	10,50,000

5. REVIEW MEETINGS BY DST

<i>Sl. No</i>	<i>Description of Trainings</i>	<i>Budget</i>			
		<i>1st Year</i>	<i>2nd Year</i>	<i>3rd Year</i>	<i>Total</i>
1.	Costs for Review and Monitoring, field visits etc	3,50,000	3,00,000	3,00,000	9,50,000
TOTAL		3,50,000	3,00,000	3,00,000	9,50,000

6. BUDGET FOR CONTINGENCIES

<i>Sl. No</i>	<i>Item</i>	<i>Budget</i>			
		<i>1st Year</i>	<i>2nd Year</i>	<i>3rd Year</i>	<i>Total</i>
1.	unforeseen costs	12,50,000	12,50,000	12,50,000	37,50,000
TOTAL		12,50,000	12,50,000	12,50,000	37,50,000

7. BUDGET FOR OVER HEADS

<i>Sl. No</i>	<i>Item</i>	<i>Budget</i>			
		<i>1st Year</i>	<i>2nd Year</i>	<i>3rd Year</i>	<i>Total</i>
1.	Institutional Overheads	1,00,000	1,00,000	1,00,000	3,00,000
TOTAL		1,00,000	1,00,000	1,00,000	3,00,000

B. NON RECURRING

BUDGET FOR PERMANENT EQUIPMENT/STRUCTURES

<i>Sl. No.</i>	<i>Item</i>	<i>Budget</i>			
		<i>1st Year</i>	<i>2nd Year</i>	<i>3rd Year</i>	<i>Total</i>
1.	Equipment	53,76,470	---	--	53,76,470
2.	Fabrication Costs	12,00,000	2,00,000	--	14,00,000
3.	*Construction Costs	45,00,000	--	--	45,00,000
TOTAL		1,10,76,470	2,00,000	--	1,12,76,470

PART IV: DETAILS OF THE IMPLEMENTING INSTITUTE

1. Description of the implementing agency (ies)

(In case of Voluntary Organizations/NGOs and Private Institutes please enclose copies of Registration Certificate/Trust Deed, Memorandum of Association including By-laws and Mandate, Audited statement of accounts for the last three years, Annual Report including activity profile for last three years.)

1. Type of organization:

Type	Implementing Org.	Collaborator
Academic Institution		
Research Organization		
S&T Council		
Voluntary Organization		
Other (please specify)		

3. Expertise available with the proposed investigating group/institution for implementing the project (Describe briefly in not more than one page)

S.No.	Name	Designation	Highest Qualification	Specialization/Expertise
1.	Dr. A. Ramaswami Reddy	Principal & Professor	Ph.D	Data Mining, Machine Learning, & Image Processing
2.	Dr. Raja Reddy Duvvuru	Associate Professor	Ph.D	Power Systems & Electrical Vehicles
3.	Dr. Deena Babu Mandru	Professor	Ph.D	Machine Learning & IoT

4.	Dr. M. Vijay Kumar	Associate Professor	Ph.D	Thermal Engineering: Solar, Emission Control Systems & Renewable Energy
5.	Dr J Anitha	Professor	Ph.D	Machine Learning, Deep Learning & Natural Language Processing

3. Infrastructure available land/building (including equipments).

4. Whether the organization is implementing EAT Module under PFMS?