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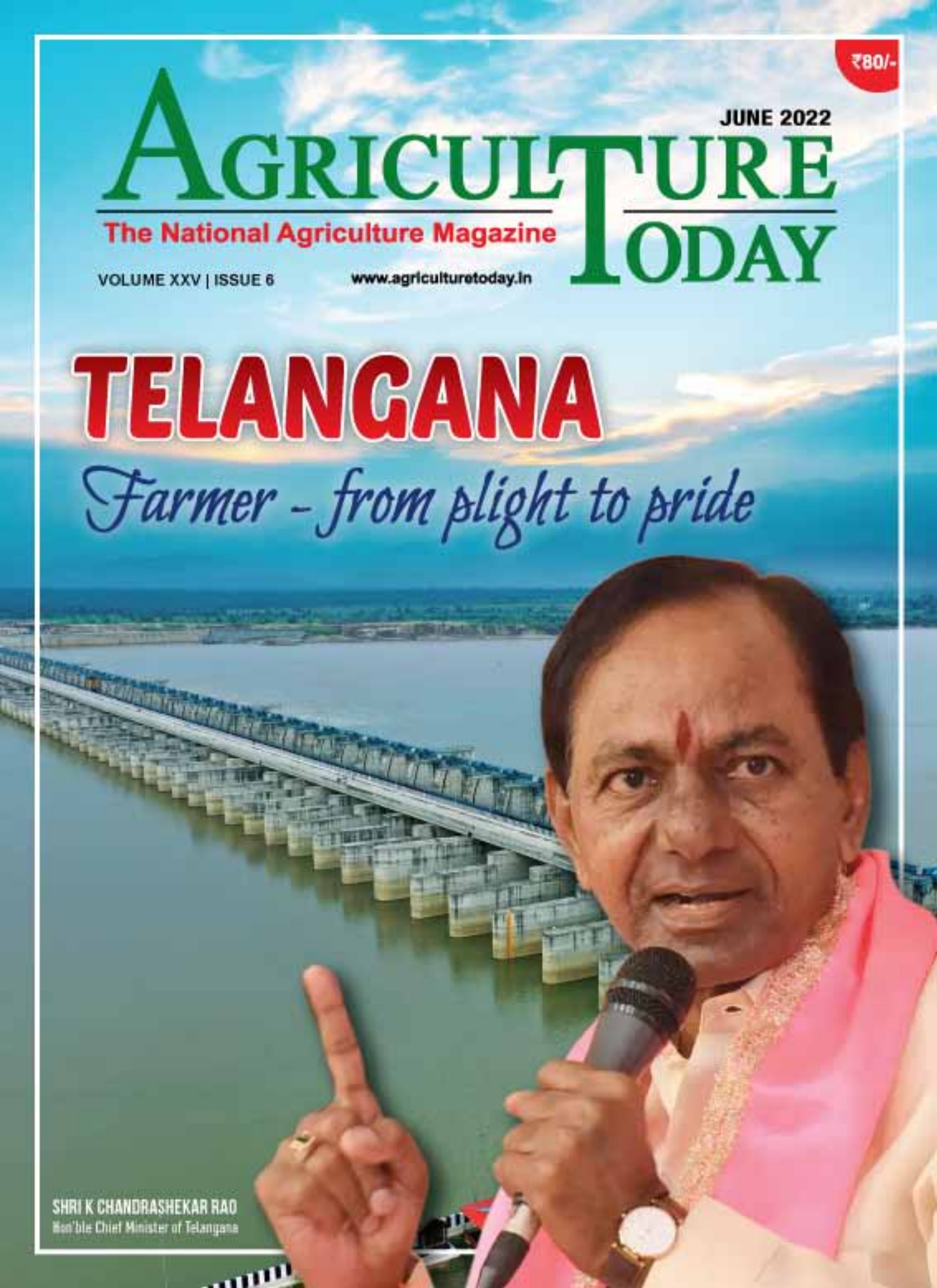
TELANGANA

Farmer - from plight to pride



SHRI K CHANDRASHEKAR RAO
Hon'ble Chief Minister of Telangana

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Telangana...
irrigating milestones!

When a state makes it a goal to improve wellness and ensure prosperity of the farming community, then the endeavours become focused and multidimensional. This is what the Agriculture Today team discovered while visiting the state for a special edition of AT on **Telangana Agriculture**.

Steered by Hon'ble Chief Minister **Shri K Chandrashekar Rao,** Telangana is scaling new heights with exemplary initiatives for agricultural development and farmers' welfare.

With the pride of the state, **KALESHWARAM** project, Telangana will be providing **irrigation to 1.25 Crore acres** to mitigate drought conditions and distress in agriculture sector… making rural economy vibrant and sustainable.

Kaleshwaram Project is planned as the world's largest multi stage lift irrigation scheme with an investment of Rs 80,190 crores, having Civil and Electro Mechanical components vis-a-vis 3 barrages, 24 reservoirs with 141 TMC storage capacity, 203 km tunnels, 93 km pressure pipe lines, 1531 km gravity canals and related infrastructure to benefit 2.5 crore population in 23 districts of Telangana State. It lifts Godavari waters from 100 m to 618 m MSL.

Rythu Bandhu – a one of its kind DBT that provides investment support to farmers; Rythu Bima, personalized life insurance to small and marginal farmers; Crop Loan waiver and door step level procurement of food grains, pulses, oil seeds and cotton are some of the initiatives that have emboldened Telangana's agriculture sector.

Rythu Vedika - farmer interaction spaces - are a novel initiative by the government for providing training and information dissemination to farmers. Strong extension networks and input supply systems ensure timely and reliable help to the farming sector.

The state is consistently educating farmers on the latest technical farming knowledge. Farmer trainings are a regular feature to boost agricultural production and productivity.

The growth and prosperity of the farming sector decides the direction of the country in terms of socio-economic development. In Telangana, the field of agriculture is brimming with promise. The June edition of Agriculture Today captures this transformation under the guidance of **Sh M Raghunandan Rao,** Agriculture Production Commissioner and **Dr Praveen Rao,** Vice Chancellor, PJTSAU.

Happy Reading

VOLUME XXV | ISSUE 6 | JUNE 2022

CONTENT

Telangana SPECIAL EDITION

‘STATE GOVERNMENT SHALL CONTINUE TO WORK TOWARDS CONSOLIDATING THE AGRICULTURE SECTOR IN TELANGANA’

Shri K Chandrashekar Rao
Hon’ble Chief Minister of Telangana

My government is committed to take all measures to develop the agricultural sector in Telangana and work with more vigour for the welfare of farmers. The proactive measures taken by the Telangana government have helped the agriculture sector to contribute to 21 per cent of the Gross State Domestic Product.

The farm sector has played a key role in strengthening the state economy. We are committed that the state government’s flagship Dalit welfare initiative, ‘Dalit Bandhu,’ reaches with greater speed all those beneficiaries who have already been identified.

Stern Action Against Suppliers, Manufacturers Of Spurious Seeds

Apart from enhancing the cultivation area under Pranahitha and Kaleshwaram projects, the state government is keen to complete all the pending projects during this fiscal.

The weather conditions in Telangana are conducive to the agriculture sector. The Indian Meteorological Department has predicted that the state shall receive bountiful rains this year. We hope that the growth in the farm sector shall be encouraging this year.

Before the new farm season began, we directed the state government officials to procure adequate quantities of fertilizers and seeds to ensure that farmers do not face any difficulties. Stern action will be taken against the suppliers and manufacturers of spurious seeds.

Farmers Should Take Up Cultivation Of Alternative Crops

There are reports that soil fertility will reduce considerably due to excess cultivation of paddy. Hence the state government is identifying remunerative crops and encouraging their cultivation as an alternative to paddy. Farmers should take up the cultivation of alternative crops like cotton, chilli, red gram and water-melon as well as rationalize usage of fertilizers.

We are committed that the state government’s flagship Dalit welfare initiative, ‘Dalit Bandhu,’ reaches with greater speed all those beneficiaries who have already been identified

We are consistently reaching out to our farmers that DAP should be used with discipline. Russia and Ukraine, who supply raw material for making DAP, are currently engaged in war. Even otherwise, the need of fertilizers needs to be rationalized in the long-term interest of the farmers.

The repeated farming of single crops for years is not in the interest of farmers. It also has an adverse impact on soil health. The concerned officials of the state have been asked to prepare a special action plan on profit-making crops. The state government is deputing the district officers, village level officials and agriculture extension officers to go on ground level visits and give suggestions to the farmers on cropping patterns.

Telangana Cotton In High Demand

Post the Covid-19 pandemic, the demand for cotton grown in Telangana has increased in China and other countries, where the crop output had reduced. Due to increasing demand for cotton in the international market, farmers should take

up cotton cultivation on a large scale. The demand for chilli is also high. We are facilitating the cultivation of remunerative crops like chilli, red gram and oil seeds among others. The state government is working on specific strategies for the development of marketable crops.

The need of the hour is to adopt alternative cropping to protect soil quality. The state government is working on the required plans which shall boost efforts across the state for the protection of soil quality.

Farmers Must Reduce Indiscriminate Fertiliser Use

It is in the interest of farmers to rationalize usage of fertilizers and pesticides to not only protect the crop, but also conserve soil fertility and earn better yield. Some farmers are of the opinion that excess usage of fertilizers will improve their yield. This is completely wrong. Instead, such practices may backfire. We have appealed to the farmers to seek expert advice on the use of urea. Farmers have been advised to use urea in three or four phases instead of one time while growing paddy.

It is in the interest of the farmers that they should seek expert advice in the use of urea. It is necessary to use urea judiciously and in a disciplined manner. Can we eat all the food in a single sitting?

Farmers must rationalize the usage of fertilisers and pesticides for higher yield and better returns

Likewise, fertilizers should also be used properly. Crops are also like our human bodies. Hence, it requires a limited quantity of urea. If we use excessively, crops will be completely damaged.

I have directed the concerned officials to create awareness among farmers about the use of fertilizers in tune with the changing conditions. Farmers must use complex fertilizers in a limited quantity.

The agriculture extension officers of the state have been directed to conduct awareness programs to farmers at local Rythu Vedikas in this regard. We are taking consistent measures to ensure that farmers do not indulge in indiscriminate use of fertilizers. The concerned officials have been directed to educate the farmers about scientific methods in the use of fertilizers.

In the wake of the ongoing Russia-Ukraine war which can affect the fertilizers supply to India, it is in the interest of farmers to reduce usage of fertilizers. Instead, farmers should increase usage of vermi-compost and green manure to conserve the soil fertility.

The state government shall keep working towards the consolidation of the agriculture sector in Telangana. The action plan for farmers' welfare shall be strengthened further and that government efforts will be continued.

Consistent Efforts To Strengthen The Farming Sector

Telangana state is preparing the district action plan for each district to strengthen the farming sector by involving district Collectors and Revenue division officers (RDOs). Agriculture is making remarkable development in the state. The question of drought in agriculture should not arise in the future. The farm sector shall not experience drought since irrigation projects are being finished quickly.

In order to ensure farmer prosperity in the state to Telangana, it is imperative that the state agriculture department should be vibrant, fast and always busy. We are constantly working in this direction. The state government shall continue to work towards consolidating the agriculture sector in Telangana.

Transforming TELANGANA AGRICULTURE

Sri. Singireddy Niranjan Reddy
Hon'ble Minister of Agriculture, Telangana State

How was the performance of agriculture sector since the formation of the state?

In the last seven years, the average growth rate of the primary sector (agriculture) in Telangana has been 15.8 per cent. This is much higher than the national growth rate of 8.5 per cent. The per capita income of the state in 2014-15 was only Rs. 1,12,162 while it grew by 111.87 % by 2021-22 to Rs. 2,37,638 and it is much higher than the national average. We are number one in production of cotton with 60 lakh acres of area under the crop in the country.

What is the production and procurement scenario in Telangana state?

We are second in the country in terms of grain procurement. In monetary terms we have procured Rs 97,924 crore worth of grains. Around 556 lakh metric tonnes of grain has been procured since the formation of Telangana state. During 2014-15, the state procured 24.29 LMTs of grain during 2014-15. Whereas, in the year 2020-21, 1.41 crore MTs of grain was procured from Telangana farmers. The area under cultivation has increased from 34 lakh acres by 2014 to 2.03 crore acres by 2021. Apart from this, Horticultural crops have also grown at the rate of 11.50 lakh acres annually. Grain production was only 45 lakh tonnes in 2014 and has reached 3 Cr tonnes by 2021.

How has the government helped in developing infrastructure for agriculture?

Over the last seven years, Rs 1.5 lakh crore has been spent on irrigation projects. We constructed the Kaleswaram project by spending an amount of approximately Rs. 83,000 Cr. While 11.99 lakh acres were under micro-irrigation in 2013-14, by 2020-21 an additional area of 7.70 lakh acres have been brought under Micro Irrigation with total of 19.69 lakh acres. Since the formation of Telangana, an amount of Rs. 28,473 Cr has been spent on development of infrastructure in the power sector by providing power to agriculture sector. The government was able to extend 24 hours free power for almost 26 lakh pump sets in agriculture sector with a cost of about Rs.10,500 Cr every year. The capacity of all types of godowns in the state was merely 39 lakh metric tonnes in 2014-15, which has been increased to 68.28 lakh metric tonnes so far by spending an amount of Rs. 1024.50 Cr .

Timely credit is an important need of farmers especially for small and marginal farmers. How has Rythu Bandhu scheme helped them?

An amount of Rs. 50,448.16 Cr has been transferred directly to the 63 lakhs farmers' accounts for an extent of 1.50 crore acres (each season) in the past eight seasons at the rate of Rs.5000/- per acre under prestigious Rythu Bandhu Scheme. Since the formation of Telangana an amount of Rs. 17,244 Crs of farmer loans have been waived off in two terms.

What are the production programmes and schemes adopted by the government which has benefitted the farmers of the state?

Under the Farmers' Insurance Scheme (Rythu Bhima), so far 75,276 deceased farmer families have received Rs. 3763.80 Cr as compensation @ Rs.5.00 Lakhs per family. Under Mission Kakatiya scheme, we have carried out restoration of about 42,000 of ponds/tanks . One Agriculture Extension Officer was appointed for every 5,000 acres in the state. 2601 Rythu Vedikas were constructed at a cost of Rs. 22 lakhs each by spending an amount of Rs. 573 Cr. To provide a remunerative price to the farmers Telangana Government has identified about 500 acres of land in each district to establish the SFPZs (Special Food Processing Zones) by value addition. The only state adopting digital recording of every Gunta under cultivation by the name of crop booking

How has the government ensured that the seed requirements of the farmers are met in every season qualitatively and quantitatively?

Adequate quality seeds and fertilizers are being provided to the farmers before every season and made available through Primary Agricultural Co-operative Societies and other methods without any shortage. In the past seven years, 38.34 lakh quintals of seeds of various crops have been supplied to the 43.26 Lakh farmers under subsidy with an amount of Rs. 857.27 Cr. Telangana is the only state which is implementing the PD Act against those found guilty of counterfeiting and making the seed spurious. Telangana is providing 3 Cr packets against the all India requirement of 6 Cr packets of cotton seed.

What are the interventions from the government in increasing the farm mechanization in the state?

Since the formation of the state, a total of Rs 951.28 crore has been spent on farm mechanization and 6.70 lakh agricultural implements have been distributed on subsidy. While 94,537 agricultural tractors were available in 2014-15, they have now reached to 2.14 lakh. Similarly 6,318 harvesters that were available in 2014-15, has now increased to 14,483.

Agricultural Marketing is a key aspect in agriculture. What are the new happenings in this segment in Telangana?

For the first time in history, 192 Agricultural Market Committee Chairman posts in Telangana were filled through reservations, unlike anywhere else in the country. Establishment of Market Research & Analysis Wing to anticipate market demand for crops and indicate to farmers which crops to plant before the season

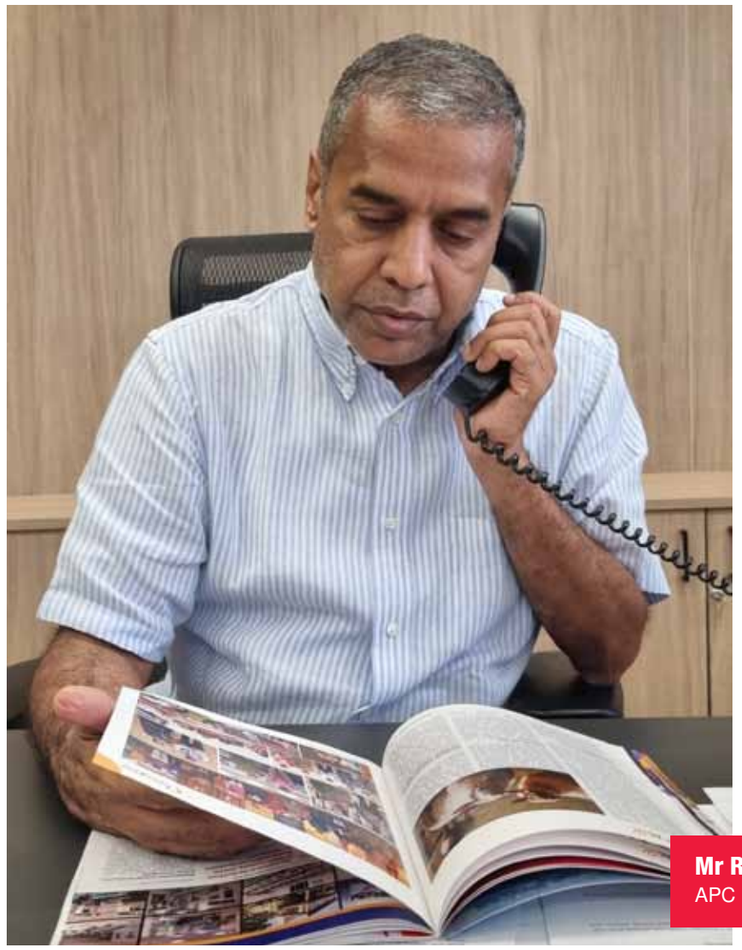
Which is a prospective new crop that the government is keenly promoting for the sake of crop diversification?

The government is taking all possible steps to increase the area under oil palm cultivation to 20 lakh acres in the next three years by promoting oil palm cultivation on a large scale which will benefit the farmers in the long run as part of crop diversification.

THE TELANGANA FARMER

A Journey from Plight to Pride

Agriculture flourished in Telangana in pre independence times mainly through the established tank irrigation systems. However, plagued by negligence of and hence a heavy dependence on electrified bore wells pushed the agriculture sector to the brink of a crisis in the 1990s. There was a loss in the area under tank irrigation in the state, of 3,71,265 acres from 1956-57 to 1990-92, and an additional 4,00,792 acres by 2005-09. Tanks were completely neglected, and tank irrigation was replaced significantly by groundwater irrigation during this period. The area irrigated by wells increased by 6,01,509 acres between 2001-05 and 2005-09 alone.



Mr Raghunandan Rao IAS,
APC

The free power policy implemented from 2004, did not provide much succour as power was available in 2 shifts – one in the dead of the night. This not only had a direct impact on crop productivity but also on the dignity of farmers. From being the backbone of the economy, farmers were reduced to standing in queues for hours and days to access essential raw materials, such as seeds and fertilisers, and had no certainty of power supply or markets.

By the late 1990s and early 2000s, the agricultural growth in Telangana was accompanied by an increase in rural poverty as well as a significant decline in the consumption levels of both marginal peasantry and agricultural labourers as suggested by the NSS 55th round data. This was a direct consequence of the long-term neglect of the agricultural sector in Telangana.

While the agriculture sector in the state was in dire straits in the year of Telangana's formation, with farmers migrating out to other states in search of better and more respectable work opportunities, the Hon'ble Chief Minister, Sri K. Chandrasekhar Rao, vowed to restore the pride of the farmers in their occupation. A slew of initiatives was taken by the government to undo the effects of the inappropriate policies implemented in the previous decades.

Improved Access to Irrigation Facilities

Recognizing the importance of expanding the overall irrigation facilities for boosting farmer incomes, and in particular, the criticality of rejuvenating tanks in the state, the Government adopted a multi-pronged approach to drastically scale up the irrigation coverage in the state. The strategy adopted included completing ongoing projects, taking up new irrigation projects and lift irrigation schemes, restoration of tanks and water bodies under Mission Kakatiya, modernisation of old projects, and linking irrigation tanks with other projects.

Since state formation in 2014-15, an amount of Rs.1.3 lakh crores has been spent on irrigation projects by the government. State government efforts to improve irrigation by commissioning new projects and improving old irrigation infrastructure have begun to pay off. The overall gross irrigated area in Telangana increased by 119% between 2014-15 (from 62.48 lakh acres) and 2020-21 (136.86 lakh acres). The Gross Sown Area significantly increased from 131 lakh acres in 2014-15 to 210 lakh acres in 2020-21.

Rythu Bandhu is a precursor to various schemes across the country, such as the Kalia scheme in Odisha, the Rajiv Gandhi Kisan Nyaya Yojana in Chhattisgarh, and the PM KISAN scheme at the country level. The FAO has recognized the Rythu Bandhu Scheme as one of the top 20 schemes in the world, and it was presented at the FAO innovation fair in Rome, in November 2018.

Rejuvenation of Water Bodies

In addition to improvements in irrigation facilities, the following initiatives were undertaken for rejuvenation of water bodies

- Launch of Mission Kakatiya for restoration of all irrigation tanks, kuntas, anicuts and check dams in 2016. Under Mission Kakatiya, 27,665 tanks were restored at an expenditure of Rs.5,349 crores, stabilizing an ayacut of 15,07,343 acres and restoring 8.9 TMC of storage capacity. In spite of heavy rains during 2019-20, 2020-21, and 2021-22, breaching of tanks has been a rare occurrence.
- Construction of 1,250 check dams with a capital outlay of about Rs. 5,000 crores, on 4th to 8th order streams to capture run-off and regenerated water in the streams, thereby ensuring rejuvenation of the streams.

Rejuvenation of water bodies not only improved water availability for the year in which rejuvenation was carried out, but also improved water storage capacity for the years to come.

About 40% of power supplied in the state is towards agriculture. 6.39 lakh new agriculture connections have been released after the formation of the state at an investment of Rs. 3,196 crores, taking the total number of agricultural electricity connections to 25.63 lakh.

Rythu Bandhu

Government of Telangana launched a first-of-its-kind input support scheme in India in the year 2018. Under the 'Rythu Bandhu' scheme, Rs.5,000 per acre per farmer is disbursed at the beginning of every season through Direct Beneficiary Transfer (DBT) mode. This assistance helps farmers in the purchase of inputs such as seeds, fertilizers, pesticides, labour costs and other investments by farmers. The DBT ensures that farmers get support in a reliable manner, without any red tape. By the end of 2021-22, a total amount of Rs. 50,449 crore had been disbursed to farmers under this scheme since 2018. 63 lakh families have benefitted from the scheme so far.

24x7 Free & Quality Power Supply to all Agricultural Consumers

Access to power is vital for improving agricultural productivity through extraction of ground water for irrigation. The Government corrected the issue of low-voltage power supply to farmers at odd hours of the day by first providing 9 hours of free power during the day to agricultural consumers starting 1st April, 2016. Thereafter, starting 1st January, 2018, the Government of Telangana has been providing 24 hours free, uninterrupted, and quality power supply to agricultural consumers in the state.

Rythu Bima

To provide relief to the family of farmers in the unfortunate event of the farmer's death, the Government launched Rythu Bima – a farmers' group life insurance scheme – in the year 2018 for farmers aged 18 to 59 years. The premium amount is paid by the government to LIC. The scheme provides a sum assured Rs 5 lakh, which is paid to the designated nominee of the farmer through an online system within a few days of the farmer's death, irrespective of the cause of death. Under the farmers' social security scheme, 81,449 families

have received benefit amounting to Rs. 4,072.45 Crores.

Rythu Vedika

In order to provide a common platform for exchange of information about different issues of interest to farmers, the Government has constructed 2,601 Rythu Vedikas across the state. Each Rythu Vedika falls under the purview of an Agriculture Extension Officer (AEO), each of whom has a 5000 acre cultivable area cluster. Rythu Vedikas have been serving as platforms for:

- Creating awareness among farmers about welfare schemes to reduce information asymmetry;
- Imparting skill trainings to farmers;
- Encouraging farmers to adopt innovative and modern agriculture practices;
- Ensuring flow of credit to the agriculture and allied sectors
- Helping farmers organize themselves into groups to protect their rights;
- Facilitating the availability of ground-level information to the upper echelons of the administrative hierarchy through the AEO.

Crop Loan Waiver – 2014 and 2018

Recognizing the immense burden of debt and accompanying helplessness that many farmers in the state were faced with, the Government waived off the outstanding loans up to Rs. 1 lakh of all farmers as on 31st March, 2014. In total, the Government incurred an expense of Rs. 16,144.10 crore to write off the debt and provide relief to 35.3 lakh farmers in the state.

Since farmers were getting trapped in the perpetual cycle of indebtedness, in March, 2020, the Government took the decision of waiving off the outstanding loans of upto Rs. 1 lakh of all farmers as on 11th December, 2018. In 2020-21 and 2021-22, under the 2018 loan waiver, an amount of Rs. 1,171.57 crore was waived off, benefitting 5.3 lakh farmers.

Agri-Innovations

The Government has introduced innovations such as the Agri-Hub for promoting Ag-tech start-ups, the 'Saagu-Baagu' project in collaboration with the World Economic Forum, for promoting new age technologies and innovations such as Artificial Intelligence, Internet of Things, remote sensing, and block chain in agriculture, the 'Telangana Agricultural Market Intelligence Unit' to improve farmers' incomes through better price realization, enhancing market-oriented crops, and effective market planning, and urban farming initiatives aimed at encouraging vegetable cultivation in the neighbourhoods of Hyderabad to ensure balanced nutrition and to improve vegetable supply

Other measures such as ensuring that farmers do not have to stand in long queues to collect seeds and fertilizers, and making inputs available in a timely manner have helped build the confidence of the farmers in the state. The state has also successfully instilled a feeling of dignity in the farmers by ensuring that they do not have to run between offices to collect any monetary incentives.

Increase in the productivity and production of all major crops across the state

The overall agriculture production in the state has increased by 52% from 232 lakh MT in 2014-15 to 353 lakh MT in 2020-21. The effectiveness of the state's agricultural policies and incentives can also be gauged from the noteworthy increase in paddy and cotton production since state formation. Between 2015-16 and 2020-21, paddy production increased by a massive 378%, and cotton production increased by 61% in the same period.

Between 2015-16 and 2020-21, the area under horticulture crops has seen a growth of 304%. In 2020-21, total horticulture production was 59.03 LMTs, an increase of 101% compared to 2015-16.

The gross value added by the agriculture and allied sectors to the state economy has seen a CAGR of 13.94% from Rs.76,123 crores in 2014-15 to Rs.1,89,826 crores in 2021-22.

Well-organised, efficient, and timely procurement of major crop produce by the government from the farmers has reduced their dependence on middlemen for selling of their produce. This has further nudged farmers in the direction of increased cultivation. Further, the state government is actively supporting transition to demand-driven and commercial agriculture to provide sustainable incomes to farmers through initiatives such as crop diversification and the oil palm mission, etc.

Telangana has rapidly moved out of the past shadow of farmer suicides, extreme indebtedness, and lack of irrigation facilities, and has become a model for farmer-friendly initiatives in the agriculture sector, leading to a more empowered farmer community that now takes pride in its role as a nourisher of the state and contributor to the nation-building process.

Telangana SPECIAL EDITION

PROFESSOR JAYASHANKAR TELANGANA STATE AGRICULTURAL UNIVERSITY

Striving for a greener tomorrow

The inception of the Farm University PJTSAU in 2014 for the newly formed state of Telangana was conceived on a strong pedestal of designing solutions to agrarian constraints of societal relevance. Main streaming the academic, research and extension progress in tune with the State initiatives on a short to long-term road map was envisioned through a multi dimensional mission mode approach. The accomplishment by the University in the last seven years has catapulted it to the higher echelons of National Agricultural Research and Education System (NARES) of India and has positioned itself in the top, among the premier HEI's as ranked by various agencies including ICAR and was suitably bestowed with plethora of awards. Commitment to quality in all work spheres was evidenced by the ISO 9001:2015 certification attained by the University.

Improving Academics and Infrastructure

Immediate necessity of augmenting academic infrastructure was fulfilled by adding three new Agricultural Colleges at Palem, Warangal and Sircilla and one Food Science &

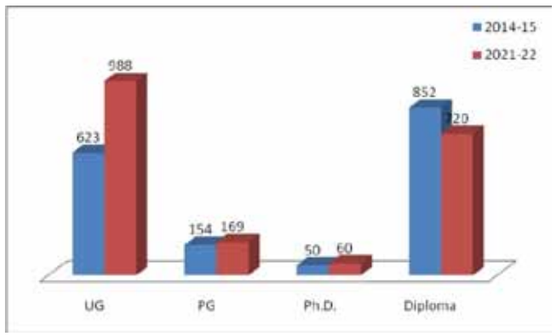
University photo

Dr. V. Praveen Rao
Vice Chancellor, Professor Jayashankar Telangana State Agricultural University

Aerial view of main campus

Agricultural College, Jagtial

College of Food Science & Technology, Rudrur



Comparison of Students' intake

Technology Campus at Rudrur post 2014 in addition to earlier existing three agricultural colleges at Rajendranagar, Aswaraopet, Jagtial, one Community Science college at Saifabad and College of Agricultural Engineering at Sangareddy with state-of- art facilities. All the UG, PG and Ph.D programmes in the colleges and the University have been accredited by ICAR with 'A' grade. Skilling the rural youth excelling in Secondary School Education was accomplished by starting 13 Polytechnics offering Diploma in Agriculture, Agricultural Engineering and Seed Technology. University has embarked upon improving the faculty student ratio by undertaking recruitment of entry level teachers to shoot the figure to an unprecedented 1:6.5, an all time best. The Students intake increased from 623 (2014) to 988 (2022) in the under graduate program. Such initiatives have resulted in >11,000 students passing out from the portals of constituent colleges of the University. All the new colleges established have modern college buildings / hostels, well equipped labs and sports and games facilities. As part of Student READY programme to facilitate uniform hands on training across campuses, 3 common experiential learning units of vermicompost, soil and water analysis labs and polytunnels were set up.

Encouraging Student's Extracurricular Activities

The University is constantly encouraging the students to excel in extracurricular activities which brought laurels to the University at national and international level competitions. Ms. V. Manasa Reddy, Student of Agricultural College, Jagtial bagged 1 Silver and 1 Bronze medal in 4th International Turkish Open Kick Boxing Tournament-2019 held at Antalya, Turkey. Ms. K. Praneetha, and Ms.V. Manasa Reddy, Students of Agricultural College, Jagtial bagged 3 Silver medals in Wako Indian National Kick Boxing Championship -2018 held at New Delhi. Ms. K. Laxmi Prasanna student of Agricultural College, Jagtial bagged two silver medals in the WAKO Indian open international kick boxing tournament 2020 held at New Delhi. Ms A.G. Akhila of Agricultural College, Palem has represented the Telangana State for Republic Day Parade in 2022 at New Delhi. The students also participated at national level events in sports, literary and cultural activities and have bagged several prizes.

Front-runner in enhancing quality of education (New Innovations)

PJTSAU has been in the forefront in embracing the national level developments and implemented Vth Dean's Committee syllabus and guidelines at UG level. Quality education was realised by establishing virtual and model classrooms, AR-VR lab and language labs, enabling effective learning atmosphere through interactive instructions. Digital mode of course material and paper evaluation were efficiently executed.

A course on design thinking for entrepreneurship was introduced to the final year students to inculcate entrepreneurial culture among the students which was first of its kind in agricultural universities of the country. The University was the first to initiate health profiling of the students through well-established diagnostic labs in health centres.

Advances in Postgraduate education

The University offers PG programmes in 12 disciplines including MBA Agri-Business Management in Agriculture, 5 disciplines in Community Science and 3 disciplines in Agril. Engg. & Technology at Rajendranagar, Jagtial, Saifabad and Sangareddy. The doctoral programmes are offered in 8 disciplines in Agriculture and 2 disciplines in Community Science with Rajendranagar being the main campus. PJTSAU was the first University to admit PG students through the national levels ICAR AIEEA/AICE from 2018. The academic rigor was also ensured through externally obtained question papers and quality research at both PG and Ph. D levels and a system of external scrutiny of all the research synopsis by eminent scientists. The State of Art, Central Instrumentation Cell established with a budget outlay of Rs.5.5 crores. Housing sophisticated instruments for PG research such as ICP OES, HPLC, GC and the RS and GIS lab provide students an opportunity to conduct quality research.

Thrust to multidisciplinary, problem oriented research programmes

Crop oriented field research in the University has been executed on multidisciplinary platforms with strong inter institutional linkages aimed at delivering technological solution modules with location specificity. The research programmes are carried out at 15 research stations including 27 AICRP schemes located in three agro-climatic zones of the state. The research is directed at complete value chain system in food and commercial crops leveraging the merits of emerging technological advancements in the areas of AI, Satellite imagery, precision irrigation, remotely operated aerial vehicles, big data analytics etc., In such continuum new research stations / schemes were added at Tornala, Jagtial and Adilabad in crops like Maize, Sunflower, Groundnut and Mustard.

The University also holds the distinction of being first institute in the country to be cleared by the DGCA to carry out research in drone applications in agriculture and is in the process of developing spray protocols in major food crops, besides undertaking capacity building of rural youth and other partners in the area.

PJTSAU has also accredited faculty from ICAR institutes (65), ICRISAT (20) and Industry (22) to mentor the PG students. Two students of MBA(ABM) and Foods and Nutrition (2+1 faculty) visited Cornell University as part of IARD programme and 3 students pursued part of their PG research at University of Hohenheim, Germany in 2019. By far the most progressive initiative was the institution of dedicated research grants to the tune of Rs 40,000 per PG and Rs 1 lakh per Ph.D. student to enable interdisciplinary and problem solving research that produce publications in high NAAS rated journals since 2019. In addition, certain industries are also extending fellowships to the research scholars. An innovative Design thinking Certificate programme" attracted 28 PG students and faculty. Implementation of the BSMA 2021 recommended syllabus from 2021-22 is ample testimony of student facilitation.

Central Instrumentation Cell

Green Initiatives

Academic institutions were suitably strengthened by undertaking green initiatives like harnessing solar energy by installing roof top solar power panels, commissioning roof water harvesting structures and sewage treatment plants.

Incentives for faculty

Scientific outlook of the faculty has been encouraged by providing incentives for high NAAS rated research publication, highest funded external projects and deputing for higher studies in deficiency areas in India and abroad. Further, professional competence of the scientists was upgraded from time to time by enabling capacity building programmes in reputed national and international organizations.

Modernisation of Libraries as Knowledge Management Centres

Digitization of the latest knowledge repository and offering it to the beneficiar-

Telangana Sona – the Torchbearer

Branding of Telangana Sona

ies was achieved through modernisation of Knowledge Management Centres in the form of housing books (60244) e-Journals (5207), e- Books (1248), Online Databases (14), CD ROMs (7,852) reprographic and internet facilities. RFID self-check system has enhanced manifold the circulation rate of reference books. Research carrels and PJTSAU KMC App has been an innovative and pro-active step taken to increase the student proximity to science. All the libraries at colleges have access to the e-resources on the central KMC at Hyderabad thereby provided scope for faculty and students to utilize the resources.

Impact of technologies developed

yielding economic product. Rice variety Telangana Sona was the torchbearer for the success journey of the University.

The philosophy of saving precious irrigation water by evolving short duration rice culture with superior quality attributes was given shape through cultivation of the variety envisaging conservation of ~11 tmc water in one lakh acres.

PJTSAU has left no stone unturned in quick commercialization of prospective technologies in other crops like maize, red gram, sesame etc., Seed production of Maize hybrids of PJTSAU was commercialized by entering into 34 MOU's with top seed companies.

Release of improved varieties of crops

Presently the University holds the rare distinction of developing 47 varieties/ hybrids in mandate crops (Rice-15, maize-3, sorghum-5, greengram-3, redgram-8, castor-1, sesamum-3, soybean-1, groundnut-1, cotton-1 and fodder-6) in a very short period of seven years. Many of these cultivars have established Pan India presence by sheer performance and have gained immense patronage by farmers across ecosystems.

The University has developed and validated nearly 105 technologies in areas like Natural Resource Management (76), Farm Mechanization (11), Crop Protection (18), which have demonstrated perceptible reduction in cultivation expenses besides being sustainable upon adoption.

The newly formed State warranted homebred crop varieties which were resilient besides being highly potential in

Dry Direct Seeded Rice

AWD method in rice

demonstrated perceptible reduction in cultivation expenses besides being sustainable upon adoption. Among these technologies High Density Planting System in Cotton (244 demonstrations), Dry Direct Seeded Rice popularised in 20,000 acres, Farm mechanization in maize demonstrated in 100 acres and adopted by farmers in 2.0 lakh acres of Warangal and Karimnagar and Broad Bed Furrow system in Soybean demonstrated in 110 acres were important. Technologies like natural dyes, acoustics in pest management etc., after thorough validations were taken to next level by seeking product/process patents.

On farm demonstrations were conducted on Alternate wetting and drying (AWD) in ground water irrigated rice on 131 farmers' fields at 10 centres. Higher (3%) grain yield (6161 kg ha-1) was recordedwith AWD than farmers practice (5976 kg ha-1)

NABL Accredited laboratories and Training centres

The technical competence of the University was testified by the presence two QCI/NABL accredited, ISO 17025:2017 certified laboratories. Quality Control Laboratory (15,928) and Pesticide Residue Laboratory (7821) analysed raw and processed food samples for various nutritional and anti nutritional factors. Further, operationalization of a Product Training Centre in collaboration with TAFE in PPP mode to train various stakeholders including students of PJTSAU on farm mechanization has opened new vistas in prudent use of technology.

Quality seed production and distribution

Apart from generating large quantities, quality of seed was ensured by establishing fool proof seed quality traceability system using digital technologies in collaboration with a start-up firm Trace X on block chain platform. So far 19,000 q of Breeder seed and 82,000 q of other class seed were produced, thus projecting Telangana as 'Seed Bowl' of the Nation.

Agro-technologies developed

Besides this, the University has developed and validated nearly 105 technologies in areas like Natural Resource Management (76), Farm Mechanization (11), Crop Protection (18), which have

Launch of Kartha Gold – University brand Safflower oil

Training of Students at TAFE

Launching of drones in Agricultural operations

Value addition

Advances registered in various field sciences were carefully and profitably extended to post production arena and cold pressed extraction of oil from safflower, sesame, organic red gram dal and turmeric powder of best quality were successfully piloted and scaled up under FSSAI licence to be self-sufficient and profit making ventures.

Research in frontier technologies

The University has made significant progress in advanced areas like Biotechnology, Water Technology, Post harvest quality testing, Seed Technology finding solutions to nagging field problems. Further, the University also holds the distinction of being first institute in the country to be cleared by the DGCA to carry out research in drone applications in agriculture and is in the process of developing spray protocols in major food crops, besides undertaking capacity building of rural youth and other partners in the area.

Crop oriented field research in the University has been executed on multidisciplinary platforms with strong inter institutional linkages aimed at delivering technological solution modules with location specificity.

Enabling environment for innovation and entrepreneurship

PJTSAU stood apart from other SAUs of the region by nurturing an enabling ecosystem for incubating research innovations emanating from academia, researchers and rural innovators. Many such ideas have been incubated and given handholding. Bio fertilizer production, natural dyes production, millet processing and Food processing centres sponsored by MOFPI are important to name a few.

As a part of the endeavours, PJTSAU has launched first of its kind named AgHub built in a Hub and Spoke model with rural spokes at Jagtial, Warangal and Vikarabad.

The Village Adoption Programme

This is one of the unique efforts wherein each of the colleges, research stations and KVKs with their faculty and resources focus efforts to transform and facilitate village development process. This soil fertility mapping is carried out for the village and suitable recommendations are made from to time-to-time.

Farmer Outreach approach refined

Front Line Extension machinery of the University formulates its activities through eight KVK's and nine DAATTC's to outreach the unreached and better reach the already reached clientele. Accordingly, two new KVK's were established.

As a part of Technology Assessment, Refinement, demonstration of University generated technologies in 16,593 locations, 9,460 on farm trials and 7,133 Front Line Demonstrations were organised. KVK's and DAATTC's conducted 5,900 varietal minikit trials across the state.

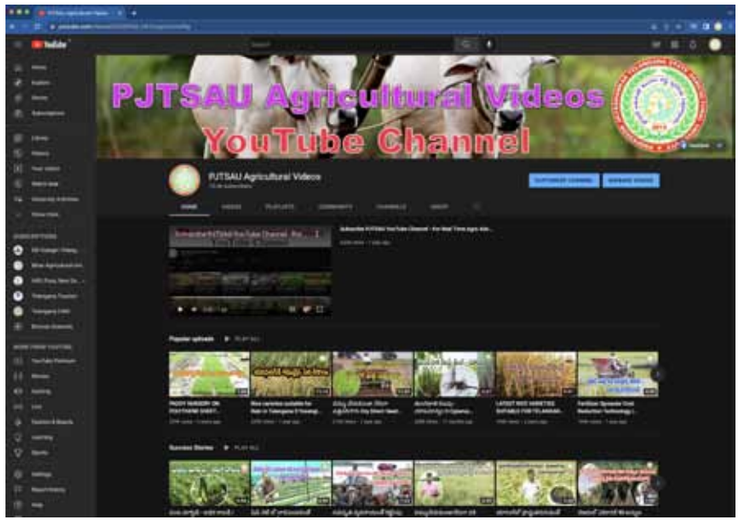
PJTSAU is also the nodal centre (EEI) for South India to undertake capacity building programmes for Extension personnel on latest developments by conducting 491 trainings to 12,449 extension personnel. Novel initiatives like Telangana Yuva Rytu Sagubadi – a certificate course for 330 farmers and training 506 MAO's as Agronomists has left an indelible mark in the recent farm history. Digital recording studio, second popularly subscribed and viewed SAU YouTube channel in the country always adorn the success story of the Institute. University YouTube channel with 296 videos uploaded, 69,600 subscribers and 53,12,386 views became most viewed channel.

Mobile based Apps like Gyan Kisan, Yantra lakshmi and Crop darpan were designed, developed, validated and are ready for launch for the benefit of farming community. Further, Annapurna Krishi Prasaraseva / Kisan Sarathi – a mobile based advisory service has been developed for issuing timely suggestions to farmers, thus benefiting 1,30,122 farmers with 7597 advisories and 7,573 text and voice messages so far. Diagnostic bulletins, publications as Telangana Vyavasaya Diksuchi (Farmer's Almanac), interactive DVD's, mass contact programmes have made a dent in orienting the farmers towards good agricultural practices. This could be accomplished through TV coverage (447), Radio talks (656), press notes (2957) and 460 publications.

Eco-colours for auspicious occasions

Millet products developed

PJTSAU has been in the forefront in embracing the national level developments and implemented Vth Dean's Committee syllabus and guidelines at UG level.



YouTube Channel

In view of such outstanding initiatives, the University has become the seat of scientific interactions and exchange of ideas among agricultural fraternity of the country and could successfully host 42 seminars/conferences of national and international significance in spite of the pandemic. Such a professionally enviable position has led to signing of 9 International and 53 National MoUs with organisations of repute for joint collaborative R&D activities. With such a track record the PJTSAU is poised to become the epitome of agricultural research and education in the country in general and the State in specific.

PJTSAU AGHUB

BUILDING A VIBRANT AND IMPACTFUL INNOVATION LANDSCAPE

Agriculture remains one of the most significant and important components for a strong national economy today. While it is true that this sector is significantly impacted by climate change, it has an inherent prowess to build strong resilience to ensure sustainable environment for the future. The famous quote of 1700's by Thomas Jefferson in his letter to George Washington that *"Agriculture is our wisest pursuit because it will, in the end, contribute most to real wealth, good morals and happiness."* is as relevant today as it was then. But the key to such processes is most certainly bringing new, and viable innovation systems into to a reality. When applied to the agri-food sector, this process of innovation can bring the needed development of more effective products, solutions, and better services that innovators or inventors can provide to governments, markets, and society.

With the advent of the Start-up India initiative launched by the Govt. of India in 2015, the innovation culture through entry of start-up is exponentially scaling country including the agricultural sector. Till date, about 3200 Food and Agritech start-ups have been registered under the Start-up Initiative of the Government of India. There are nearly 100 Agribusiness Incubators (ABIs) supporting these Food and Agri start-ups. These include ~10+ ABI's under NSTEDB, DST, ~5 BioNests under BIRAC, DBT, ~30 RAFTAAR ABIs (RABI) under MOA, 50+ ABIs under ICAR, and ~7 Rural Business Incubation Centres (RBICs) under NABARD). Most of these incubators have been promoting entrepreneurship in agri-food sector and early signs of success are emerging.

Given the above-mentioned changes in the ecosystem, a strong need was felt for making new frontiers in the Food & Agribusiness Innovation landscape in the State of Telangana. With this in mind, a first of its kind initiative of Agri Innovation Hub was contemplated way back in 2018-19 by PJTSAU and now is taking shape. AgHub, the Agri Innovation Hub at PJTSAU was incorporated in October 2020 as a Section-8 company. With a vision to emerge as world class Agri Innovation Hub that promotes innovations and entrepreneurship in Agri-food systems for a local change with a global impact, AgHub has formed its focussed mission to promote innovations and entrepreneurship in agriculture and rural ecosystem through mentoring, piloting, and facilitating access to market, research, and investment. The incubator is funded by NABARD under the RBIC scheme since April 2021 and was inaugurated in its current premises on August 30, 2021.

Inaugural Event of AgHub, PJTSAU

Interaction of Dignataries with Agritech Startups

AgHub has been uniquely structured as a *Hub and Spoke model* that has an **Innovation Hub** housed in the main campus at Hyderabad and caters to the promotion of innovation and entrepreneurship among the agri tech start-ups and student entrepreneurs.

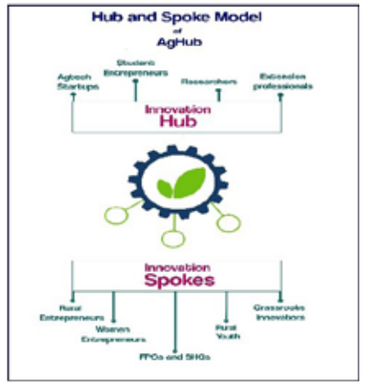
AgHub, the Agri Innovation Hub is striving fast to bring a new paradigm shift in Agricultural research, extension, and education through its wide network and vibrant, converging platform.

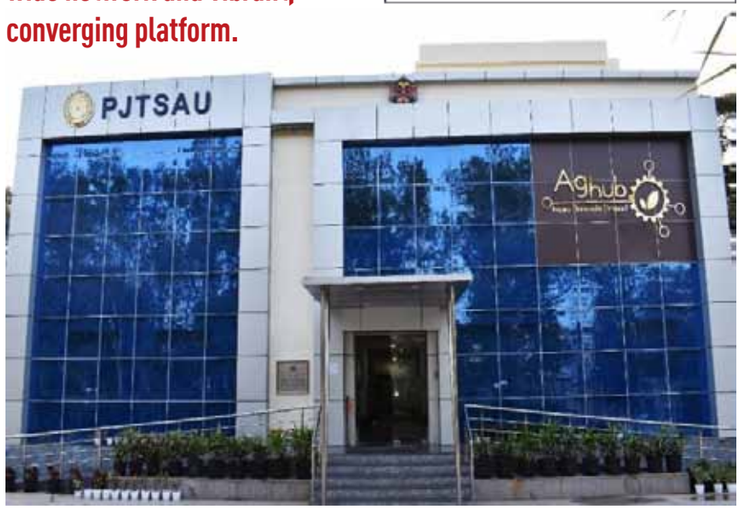
"AgHub is in a mission to evangelize entrepreneurship among all the innovators' enablers including start-ups, student entrepreneurs, rural entrepreneurs and grass-root innovators in Telangana as well PAN India with its large, extensive presence in the rural hinterlands of Telangana. We are convinced that this humble beginning of creating the much-needed Innovation Hub, the AgHub at our University has the potential to spur a strong, vibrant innovation and entrepreneurship culture in young minds, start-up founders, entrepreneurs, youth, women entrepreneurs and Farmer entrepreneurs".

The Rural **Innovation Spokes** across the State seek to cater to promotion of entrepreneurship and agribusinesses among rural youth, women, farmers / FPOs and Grass root Innovators.

Current Initiatives of AgHub,PJTSAU on Innovations and Entrepreneurship

Since December 2020, AgHub has started making pioneering efforts in building a vibrant and impactful innovation landscape.





i. Incubation Program

This is a customized handholding programme to innovative start up founders across the Food and Agriculture landscape who are venturing with ideas/ POC/ early-stage start-up. Such entrepreneurs are offered *product development support, customized scientific/ business mentoring, advisory on regulatory issues, go to market assistance, fund raising assistance.* ~10 start-ups are currently being supported under this incubation program at AgHub, PJTSAU.

ii. Agritech Innovation Pilots (AIP)

A first of its kind program in India was launched to support early/ growth stage start-ups across food and agriculture landscape to pilot/ validate the start-up technology (innovative products/ tech led services) through a *soft-landing* platform at real farm situation. Agritech start-ups can deploy their solutions on ground and avail scientific validation along with customer validation and traction. ~15 start-ups are currently being supported under the Cohort-1 and 2 of the AIP programs at AgHub of PJTSAU. The First Cohort of AIP-1 has graduated and has validated 8 startup technologies under this program.

iii. Co-Innovation- A first of its kind program in India agritech landscape was created to offer early/ growth stage start-ups *to collaborate and co-create and co-develop* technology offering(products/ services) jointly between a start-up team and the agricultural scientists in the

respective domains. One start-up is currently co-innovating their product at AgHub of PJTSAU.

iv. **Enterprise Acceleration Program:** A distinct platform for the acceleration of growth stage enterprises and SMEs in Agribusiness was launched for supporting SMEs to enter in to innovation space. As a part two SMEs, Core CarbonX & Nutricircle are being supported under the same.

Building an entrepreneurship mind set among young students

Recognizing the need to build innovation spark among the young agricultural graduates and in line with National Educational Policy to build culture of Innovation and entrepreneurship of the country, **AgHub has taken unique efforts for building student entrepreneurship in PJTSAU.** It has launched *first of its kind program* **Design Thinking programs by AgHub at PJTSAU** to inculcate the culture of innovation and spirit of entrepreneurship among the young agriculture graduates and Postgraduates of the PJTSAU. This is probably the *first ever programme in any agricultural university in India* with a 3-month curriculum to orient the students on nuances of innovation and entrepreneurship through Design thinking approaches and modules on entrepreneurship and translational research. Post design Thinking Program the pool of student design thinkers build their ideas under the Ideation Platform named " Idea Sprout" and then taken forward for prototype development.

Award for Best Pitches by Students (UG & PG) under Idea Sprout Program of AgHub

Interactive Visits of Agritech Partners in the Ecosystem

Setting up of Rural Spokes

Three rural spokes of AgHub are now being set up at Jagtial, Warangal and Vikarabad centres. As a first initiative, series of awareness programs to promote rural entrepreneurship among rural youth, women, grassroots innovators, farmers and FPOs in Telangana are currently being undertaken.

Rural Entrepreneurship Awareness Program

Thus, AgHub, the Agri Innovation Hub is striving fast to bring a new paradigm shift in Agricultural research, extension, and education through its wide network and vibrant, converging platform. It seeks to build a two-way bridge between *urban-to-rural* and *rural-to-urban* entrepreneurial pathways. In this journey to create an enabling ecosystem it is also partnering with several players in Government, Industry, Academia and developmental institutions.

KALESHWARAM PROJECT

A GROWTH ENGINE FOR OVERALL DEVELOPMENT OF TELANGANA STATE

Telangana State was carved out of combined state of Andhra Pradesh in 2014 after a 60 years of prolonged movement for statehood. Godavari and Krishna Rivers flow through Telangana covering the entire geographical area of the state. Northern parts of Telangana fall in Godavari basin and southern parts fall in Krishna Basin. Soon after formation of Telangana State, Government of Telangana had taken up the task of providing irrigation facilities to 1.25 Crore acres (including existing irrigated area) as one of its main flagship programs spread throughout the state with the ultimate objective of ensuring 1 lakh acres of irrigation in each of the rural Assembly constituencies to mitigate drought conditions and distress in agriculture sector prevailing in the region for the last 60 years and to make rural economy vibrant and sustainable.

SRIDHAR RAO DESHPANDE
Officer on Special Duty to CM,
Telangana State

Government Strategy

To achieve this goal, Govt of Telangana adopted a four pronged strategy

i) completing the ongoing projects commenced by the erstwhile governments by re-engineering of projects

ii) Grounding and Completion of projects which were sanctioned but not grounded by the erstwhile state of AP in a time bound manner

iii) Modernization and restoration of existing major and medium irrigation sources to bring total contemplated ayacut under irrigation bridging the gap between Irrigation Potential Created and Irrigation Potential Utilized

iv) Restoration of 46,500 minor irrigation tanks which are considered to be life line of Telangana for ages.

Evolution of Kaleshwaram Project

Earlier, Dr.B.R. Ambedkar Pranahita-Chevella Sujala Sravanthi project was contemplated to divert 160 TMC of water to irrigate 16.40 lakh acres of ayacut in 7 districts. Government of Maharashtra raised objections on submergence in their territory due to construction of barrage with FRL +152.00 m and requested to reduce the FRL to +148.00 m. In order to make the project functional and achieve the contemplated benefits and effectively utilize the Telangana state's share in Godavari Basin, an alternate location of barrage across river Godavari has been identified at 20 km downstream of Confluence of Pranahita and Godavari at Medigadda near Ambatipalli village, Mahadevapur mandal of Jayashanker Bhupalapalii district with FRL +100 m.

After Re-Engineering, the project has been divided into two parts.

(1) Dr.B.R.Ambedkar Pranahita Project to divert 20 TMC of water by constructing a barrage across river Pranahita

(2) Kaleshwaram Project which envisages diversion of 195 TMC of water by construction of barrage across river Godavari at Medigadda near Kaleshwaram, and two more barrages between Medigadda and Yellampally Project at Annaram & Sundilla villages

Kaleshwaram Project

The conveyance system of Kaleshwaram project has been divided into seven links and works are being executed accordingly. Consortium of Public Sector Banks led by Andhra Bank and Punjab National Bank and power Finance Corporation are extending financial support to Kaleshwaram Project. A Special Purpose Vehicle by name of Kaleshwaram Irrigation Project Corporation Ltd. has been set up for this purpose.

Mallanna Sagar - The Mother Reservoir

Irrigation needs of 62 % of new ayacut under Kaleshwaram project are to be met from Mallanna Sagar, an online artificial reservoir. Apart from irrigation, it is proposed to supply 30 TMC to Hyderabad city needs and 16 TMC for industrial needs and these are to be met from Mallanna Sagar reservoir. Mallanna Sagar reservoir is chosen as mother reservoir as it is located at an altitude of 557 m above MSL. There is a need of 100 TMC water beyond Mallanna Sagar. Therefore, Mallanna Sagar reservoir capacity has been enhanced to 50 TMC from 1.5 TMC in anticipation that 50 % of required water is stored at a higher altitude. Beyond Mallanna Sagar there is another reservoir called Konda Pochamma Sagar having capacity of 15 TMC.

As a part of Integrated Godavari Basin Development Plan and for overall economic development of the State, Govt of Telangana is constructing a mother reservoir – Mallanna Sagar with a storage capacity of 50 TMC with minimum submergence and displacement. Kaleshwaram Project is a gigantic multi stage lift irrigation project which caters

to agriculture, drinking water, industrial needs in 20 districts of Telangana State. A mother reservoir like Mallanna Sagar is required. Filling of Mallanna sagar Reservoir is planned in a staged manner as per CWC guidelines. In the last water year 16 TMC were transferred to Mallanna Sagar and it is planned to store 35 TMC in the coming water year. The envisaged benefits are being met partially from Mallanna Sagar.

Series of Barrages on Godavari River

Downstream of Medigadda barrage Govt has proposed another barrage at Tupakulagudem village on Godavari River after the confluence of Indravati. The purpose of this barrage is to create pondage to Devadula lift irrigation scheme which was commenced long back. Project was contemplated to lift water for 170 days but hardly 90 – 100 pumping days are available in Godavari and the project is unable to serve its purpose. Now there will be a system of series of 5 barrages from Yellampalli to Tupakulagudem on river Godavari which will rejuvenate Godavari for a length of 170 km and 61 TMC of water will be stored well within the banks of river Godavari throughout the year.

Sadarmatt barrage is under construction on river Godavari 42 km downstream of Sriram Sagar Dam. Back waters of Sadarmatt barrage extends to a length of 17 Km. SRSP back water extends to a length of 90 km. Downstream of Sadarmatt barrage upto fore shore of Yellampalli there is a gap of 140 km. In this reach Godavari bed fall is very steep and to keep the submergence within the river banks we need to construct another 10 barrages to have continuous water storage.

Similar gap is there downstream of Tupakulagudem barrage to existing Dummugudem Anicut in Khammam district. From Kandakurti in Nizamabad district upto Dummugudem anicut in Khammam district, the length of Godavari is about 500 km. Out of this, Godavari river will be rejuvenated in a length of 275 km with the completion of proposed barrages i.e Sadarmatt, Sundilla, Annaram, Medigadda, Tupakulagudem and existing dams i.e SRSP and Yellampalli having a storage capacity of 154 TMC within the river banks.

Development of Inland Navigation

Newly proposed barrages in Kaleshwaram Project have been designed with a provision of ship locks. Govt of India has identified Godavari River as one of the potential rivers for developing in land navigation from Sri Ram Sagar Project to Bay of Bengal. Govt of Telangana has already taken up 5 barrages on river Godavari. As of now, with the rejuvenation of Godavari River, there is a big scope for development of in land navigation from Yellampalli to Tupakulagudem in length of 170 km. With the completion of these barrages 61 TMC storage is possible in this reach which enable to develop fishing activity and establish fish food processing industries.

Development of Temple and Eco Tourism

Kaleshwara Mukteshwara temple in Kaleshwaram is an old pilgrim place and thousands of pilgrims visit the temple every year to pay tributes to their departed family members and have a darshan of

Water Utilisation in the Kaleshwaram Project:	
For Irrigation of new Ayacut	134.5 TMC
For Stabilisation of Ayacut under	
Existing projects i.e. SRSP,	
Nizam Sagar, Singur, FFC (to meet 25% deficit) :	34.5 TMC
Water Supply to Hyderbad City	30 TMC
Drinking Enroute Villages and Towns	10 TMC
Industrial Usage	16 TMC
Evaporation losses	12 TMC
TOTAL	237 TMC

Shiva Linga. Vemulawada Raja Rajeshwara temple is very near to Yellampalli barrage in Karimnagar district. Vemulawada temple town is known as Dakshina Kashi. A famous Laxmi Narasimha Swamy temple is located in Dharmapuri on the foreshore of Yellampalli reservoir on river Godavari. Many Buddist sites like Kotilingala and Dhoolikatta are very near to the project site. Therefore, there is big scope for development of Temple tourism and Eco Tourism in Kaleshwaram Project area.

Manchester of the East

Establishment of Industries and development of Tourism in the area will enhance employment opportunities to the local people.

Development of Agriculture, Drinking Water and Fisheries

Bio diversity, Flora & Fauna will be increased in and around the area with the rejuvenation of Godavari River. 18.25 lakh acres of new ayacut and 18.82 lakh acres under existing projects in various districts will get irrigation water from Kaleshwaram Project. Hundreds of villages and towns will get assured and safe drinking water supply from Kaleshwaram Project under Mission Bhagiratha drinking water supply scheme as 10 TMC is allocated for drinking water in Kaleshwaram Project.

Urban Development and Industrial Sustainability

30 TMC of water is allocated to the future needs of Greater Hyderabad city, 16 TMC of water is allocated to the industrial needs and 10 TMC of water is allocated to the drinking water needs of en route villages which is made available to the people through Mission Bhaghiratha, an ambitious flagship program of Govt. of Telangana being implemented with an objective to supply safe drinking water to every house hold in the state. Now 10 TMC of water is being supplied to Hyderabad city from Yellampalli Project which is an important balancing reservoir in Kaleshwaram system through a separate pipeline for Hyderabad Metro Water Supply & Sewerage Board.

Growth Engine of Telangana State

It is envisaged by the engineering experts and economists that Kaleshwaram project would become a growth engine of Telangana State as Three Gorges dam to China though it is very small in magnitude when compared to China's TGD. It is a gigantic lift irrigation project in India which can lift 2 TMC per day to a static head of 520 meters. 139 MW Capacity pumps and motors are installed in the project. Nowhere in the world such high rating pumps and motors are used in any project, as per Lift irrigation Experts. Construction of Kaleshwaram Project main trunk is completed in a record time of three years. More than 20,000 cubic meters of concrete was poured in the project in a day which is second largest concrete consumption in a day after Three Gorges dam (TGD) which consumed 22000 cubic meters of concrete in a day. More than 1,50,000 cubic meters of earth was excavated daily in the project.

Various ministries of Govt. of India have already accorded all important clearances like Interstate, Hydrology, Ground Water, Environmental, Forest, Irrigation Planning, Cost Estimates, TAC etc. within a record time of one year. Reengineering of project made this possible.

Though the environmental and social impacts of Kaleshwaram Project are very minimal when compared to TGD and Aswan High dam, 197 court cases were filed on Kaleshwaram Project in various courts. With the unbeatable determination and political will of Hon'ble Chief Minister Sri. K. Chandrasekhar Rao and continuous persuasion and monitoring of the then Irrigation Minister Sri T. Harish Rao, the project is moving ahead with a definite time schedule.

As programmed, pumping of water from Godavari at Medigadda has commenced on 21 June, 2019 and filled up Yellampalli and Mid Maner reservoirs. Kaleshwaram Project started giving partial benefits to the farmers. By June 2021 most of the works are programmed to be completed and Telangana will witness a tremendous economic progress and will stand on top in the country in all the human development indicators. Kaleshwaram Projects will play a key role in achieving the objective of Govt i.e providing irrigation facilities to one crore acres in Telangana state.

MANAGE: 'CONCEPT NURSERY' OF AGRICULTURAL EXTENSION MANAGEMENT

IN SERVICE OF TELANGANA FARMERS

The National Institute of Agricultural Extension Management (MANAGE), Hyderabad was established in 1987 by the Ministry of Agriculture & Farmers Welfare, Government of India as an autonomous Institute as the Indian response to challenges of agricultural extension in a rapidly growing and diverse agriculture sector.

In 2021-22, MANAGE trained a total of 1614 candidates which included Officers from State Agriculture and Allied Departments, Scientists, Agripreneurs, NGOs and other stakeholders from Telangana State.

DR. P CHANDRA SHEKARA
Director General, MANAGE

Partnership with Organisations:

MANAGE believes that strong partnerships with institutions at international, regional, national, state, district and field levels are necessary to ensure synergy of efforts and optimal utilisation of knowledge resources for effective capacity development. Over more than three decades, MANAGE has established partnerships with leading international organisations, national institutions and maintains organic linkages with all public, NGO and private institutes in agricultural education, research, extension and agri-business sectors in the country to collaborate in research, training, implementation of schemes and consultancy projects.

Engagement with Stakeholders

MANAGE has been implementing important programs at national level by engaging relevant institutional stakeholders to improve the lives of filed level actors which included rural youth, input dealers, agri startups, extension professionals from public sector, NGOs and private sectors NGOs who play a key role in ensuring sustainable agricultural development in the country. The important initiatives made by MANAGE and the progress of each activity in Telangana State are given below:

National Training Programs:

Every year, MANAGE builds capacities of about 50,000 Extension functionaries, Agripreneurs, Input Dealers, Agri-Startups, FPOs, NGOs, Rural Youth, Scientists, Academia every year through its national and international training, education, agripreneurship and startup programs. MANAGE has trained 5,77,851 Extension Functionaries since its inception. During the year 2021-22, MANAGE organised 541 training programs covering 51,284 candidates.

International Training Programs:

During 2013-2015, MANAGE has successfully organised 4 USAID-India-Africa Triangular Programs for Kenya, Liberia and Malawi covering 129 senior executives. During 2016 – 2020, it organised 44 Feed-the-Future International Triangular Training (FTF-ITT) Program with the support of USAID in collaboration with ICAR on different themes covering 1144 senior executives from African and Asian countries. The countries included Afghanistan, Botswana, Burundi, Cambodia, DRC, Ghana, Kenya, Kazakhstan, Lao PDR, Liberia, Malawi, Mongolia, Mozambique, Myanmar, Nigeria, Sudan, Tanzania, Rwanda, Viet Nam and Uganda.

Changing Lives of Unemployed Rural Youth through Agripreneurship

MANAGE has been implementing a mega scheme of Government of India i.e. Agri-Clinics and Agri-Business Centres (ACABC) since 2002 in the country in partnership with NABARD, Banks and more than 150 Nodal Training Institutions (NTIs) in the country with an objective to provide intensive training to unemployed agricultural graduates, biological science graduates, agricultural diploma / polytechnic candidates to transform them into Agripreneurs.

Since the inception of AC&ABC Scheme, MANAGE has trained 2074 candidates and provided support to 607 candidates to establish Agri Ventures in Telangana State.

Through ACABC Scheme, MANAGE has trained 80,056 candidates, offered handholding support to 34,657 candidates to establish themselves as Agripreneurs successfully and start more than 32 types of Agri Ventures in rural areas. These successful Agripreneurs have not only been self-employed but also provided jobs to more than 1.86 lakh people in the rural setting in India.

Transforming Agri Input Dealers into Para-Extension Workers

MANAGE has been implementing Diploma in Agricultural Extension Services for Input Dealers (DAESI) since 2002 to educate input dealers on agricultural and allied subjects, pest management, government Acts, business ethics including practical sessions on site-specific farming activities. So far, 77,881 input dealers have enrolled for the program and 41,442 input dealers successfully completed programs and received DAESI Diploma in the country.

Professionalising Extension Services

In order to inculcate professionalism and create a cadre of highly specialised extension professionals, MANAGE has started the Certified Farm Advisor / Livestock Advisor Program (CFA / CLA), a one year certificate course for the public, private, NGOs and private sector personnel, with an objective to produce commodity specific extension experts in the country. So far MANAGE has produced 147 Certified Advisors. From Telangana State, a total of 80 candidates have enrolled for the program and 13 candidates have been successfully completed the programs.

Skill Training of Rural Youth (STRY)

Skill Training of Rural Youth (STRY) is a component implemented under

A total of 3774 Input Dealers from Telangana State enrolled for DAESI Program and 2734 Input Dealers have successfully completed Diploma. Most of these Input Dealers are now playing a key role in providing Extension Service to farmers in Telangana State.

Sub-Mission on Agricultural Extension (SMAE) of National Mission on Agriculture Extension and Technology (NMAET) and aims at imparting 7-days skill based training to rural youths on agri-based vocational areas for ensuring sustainability and income generation. STRY has achieved reasonable success in number of rural youths trained and success stories created. More than 35,000 rural youths have so far been trained under STRY.

Continuous Education for Agricultural Extension Professionals

MANAGE has been offering a one-year Post Graduate Diploma in Agricultural Extension Management (PGDAEM) since 2007 on a distance learning mode in collaboration with SAMETIs for in-service agricultural professionals working in the Government Departments, NGOs and private sector in the country. So far 20,833 candidates have enrolled for the programs and 14,130 candidate completed the diploma successfully.

Agri-Business Education in India

MANAGE has started the Post-Graduate Diploma in Agri-Business Management (PGDM (ABM) - a two-year Master's Degree) in 1996, first of its kind in India to create a cadre of techno-managers for the agri-business industry in the country. The PGDM (ABM) has got the recognition of All India Council for Technical Education (AICTE) and accredit by National Board of Accreditation (NBA). MANAGE ensures 100% placement for all students in the reputed agri-business companies. MANAGE is rated as the 3rd Best B-School in Agri-Business Education Sector in India.

So far, MANAGE has produced more than 1235 candidates who occupies very senior or middle level positions in the reputed agri-business companies in India and abroad.

Agri Startups

MANAGE Incubation Center is identified as the Center for Excellence in Agribusiness Incubation to serves as a knowledge partner in implementing RKVY-RAFTAAR (Rastriya Krishi Vikas Yojana- Remunerative Approaches for the Agriculture and Allied Rejuvenation) program at the national level. As a knowledge partner, MANAGE is responsible for handholding support to four RKVY-RAFTAAR Agri-Business Incubation (R-ABIs) ICAR-Indian Institute of Millets. MANAGE Incubation Center offers two flagship programs viz., Start-up Agribusiness Incubation Program (SAIP) and Agripreneurship Orientation Program (AOP). So far, 970 candidates have enrolled in the MANAGE Incubation Center and MANAGE supported 240 Agri StartUps.

44 candidates have successfully completed the PGDM (ABM) of MANAGE from Telangana State. All of them were placed in reputed Agri-Business Companies and occupied senior and top positions at national and international levels.

MANAGE as a Concept Nursery

MANAGE has been a "Concept Nursery" since its inception generating several new ideas and initiatives, most of them for the first time in India, continuously to strengthen agricultural extension system by involving different stakeholders in agricultural sector.

- **Service Extension through Voluntary Association – MANAGE (SEVA-MANAGE)** - to provide a platform to Retired Agricultural Professionals. 500 Retired Agricultural Professionals joined SEVA-MANGE and providing services in implementing several agricultural schemes, projects and training programs.
- **National Network of Agri Journalists - MANAGE (NNAJ-MANAGE)** - to provide a platform for Agri Journalists to act as an immediate response mechanism to disseminate messages and information to farmers. 180 Agri Journalists trained by MANAGE joined NNAJ-MANAGE and are actively contributing agricultural content for press, electronic and social media platforms.
- **MANAGE Krishi Gyandeep Knowledge Lecture Series** - to share the rich knowledge of Experts in Agriculture Sector to last mile Extension Professionals through videos. Fifteen videos of eminent persons have been shared on MANAGEIndia YouTube Channel.
- **MANAGE FPO Academy** - to address training, research, policy advocacy, consultancy support, and documentation of success stories on FPOS to support 10,000 FPOs being promoted by Govt. of India. The Academy is starting a 45 days Certificate Program for CEOs of FPOs in the country. An FPO Call Center: 040-24016710 was established to provide instant answers on FPO related queries. MANAGE FPO Academy is also starting a 45-days Certificate Program for CEOs of FPOs in 2022 and the registration is going on.
- **MANAGE National Facilitators** – to develop National Facilitators to implement Govt. of India's Programs, Schemes and Training Programs for MANAGE, State Government and UTs in the country. MANAGE selected 73 potential candidates as MANAGE National Facilitators through a rigorous National Facilitators Development Program (NFDP) in 2022. These Facilitators represent State Dept, SAUs, ICAR, KVKs, NGOs, and Private Sector from all the states in the country. They work like MANAGE extended Faculty and provide support to MANAGE programs, Govt. of India schemes / programs, State Govt. / UT programs.
- **MANAGE CSR Forum** - to act as a platform to leverage more CSR funds in Agriculture. MANAGE CSR Knowledge Forum was formed with 13 members representing different corporates and other academia. The Forum conducts regular brainstorming and workshops with the private sectors and facilitate to identify suitable agricultural projects under CSR by different corporates.

- **MANAGE Awards for Best Agri Startup** – MANAGE instituted Awards to recognize best Agri Startup in the country. MANAGE –Samunnati Awards 2021 were distributed to 20 Agri Startup in June 2021. Notification for Awards for Best NTIs and Agripreneurs for 2022 under ACABC Scheme have also been announced. These Awards will be announced every year in different categories at national, regional and state levels.
- **Awards for Best Book, Best Ph.D., and Best M.Sc., Theses in Agricultural Extension** – MANAGE has instituted Awards for best book, best M.Sc and Ph.D theses to promote quality of research and academic excellence in Agricultural Extension subject. 2021 MANAGE presented Awards to 9 Authors and Scholars in June 2021. These Awards will be announced every year.
- **Jai Jawan Kisan (Soldiers for Agriculture) –** About 60,000 ESM are retiring every year from defence services. MANAGE has initiated Jai Jawan Kisan Program to transform Ex-Servicemen into Agripreneurs through a rigorous training programs at MANAGE, KVKs and ICAR institutes. Two training programs scheduled in 2022 with the support of Directorate General of Resettlement, Directorate of Ex-Servicemen Welfare, Ministry of Defence, Govt. of India.

MANAGE trained 64 Agri Startups in Telangana State under Agripreneurship Orientation Program (AOP) and Startup Agribusiness Incubation Program (SAIP) under RKVY-RAFTAAR Project. It also sanctioned a grant of Rs.149.50 Lakhs to 14 Agri Startups in Telangana State.

Agri Startup Idea Bank – to provide a platform to share innovations in agriculture . It provides access to websites and social media platforms of Agri Startup. Agri Startup Idea Bank shares 160 successful Agri Startup ideas at http://cia.manage.gov.in/ViewStartUps.aspx

- **MANAGE Agri Film Festival - 2022** – MANAGE Agri Film Festival -2022 was organised for the first time in the country by MANAGE in March 2022. The objective of MANAGE Agri Film Festival is to provide a single window platform for all agricultural films in India, promote production of innovative agricultural films and recognise best agri films with Awards. More than 270 films have been received for the contest. MANAGE Agri Film Festival will be organised every year.
- **MANAGE Internship Program for PG Students and Ph.D candidates –** MANAGE offers a two-month Internship Program for M.Sc., and Ph.D., candidates in Agriculture & Allied subjects and other relevant subjects with an objective to provide opportunity to candidates to work closely with MANAGE faculty members in the on-going research, training, consultancy and other academic activities. During the internship period MANAGE will provide a monthly stipend of Rs. 25,000/- for M.Sc candidates and Rs. 35,000/- to Ph.D candidates.
- **MANAGE National Network of Agricultural Extension Experts (NNAEM) –** a platform to share ideas, experiences and knowledge on Agricultural Extension and strengthen collaboration. 80 Agricultural Extension Professionals from SAMETIs, EEIs, SAUs, ICAR, NGOs, Agripreneurs, and Professional Bodies formed as NNAEM. This network will emerge as a Community of Practice (CoP) on Agricultural Extension Management and promote exchange of ideas, good practices, innovations, professional issues and identify opportunities for collaborative activities.

VIBRANT LIVESTOCK WEALTH OF TELANGANA

Livestock sector is emerging as one of the most potential and income generating sectors for rural and semi urban areas. Livestock sector has been playing pivotal role in rural economy.

In Telangana Livestock is mostly concentrated in the hands of small, marginal and agriculture & landless farm labourers. 25.82 Lakh farm families own livestock & Poultry in the State. 12 Lakh households own cattle, 10.5 Lakh households own buffaloes, whereas 5 lakh Shepherd families are dependent on Sheep & Goats rearing.

MR ADHAR SINHA
Special Chief Secretary, AH, DD&F Dept & MD, Dairy Devt

DR RAMCHANDER
Managing Director, State Sheep & Goat Development Coop Fed

Livestock resources of Telangana

The State is bestowed with abundant livestock resources and occupies 8th position in in the country with 42.31 Lakh Cattle and 42.26 Lakh buffalo population. Telangana State is at 1st position in Sheep population.

Milk , Meat and Egg Production

Milk ,Meat and Eggs are main products of Livestock Sector. There has been a constant increase in the growth rate of these products since 2014. The State stands at 13th position in Milk production in the country whereas in meat production at 4th and 3rd in egg production.

Species	Number (lakhs)	All India Ranking
Cattle	42.31	15th
Buffaloes	42.26	9th
Sheep	190.63	1st
Goats	49.35	12th
Total	326.39	8th
Rural Poultry	175.44	7th
Commercial Poultry	624.55	3rd
Total Poultry	799.99	3rd

Flagship Prorgammes and welfare activities

Telangana State has become a role model in the country in implementation of many welfare schemes reaching the farmers and rural communities.

Incentive to Milk Pourers:

The scheme was inaugurated on 14th November 2014 by Hon'ble Chief Minster Sri. K.Chandrasekhar Rao. The Government is providing Rs.4/- per liters as an incentive to the dairy farmers who pour milk to the Cooperative dairies. Milk pourers of Vijaya Dairy, Mulkanoor Womens' Cooperative Dairy, Karimnagar Dairy and Nalgonda- Ranga Reddy Milk Producers Mutually Aided Cooperative Union Limited are being benefitted under this programme. The eligible dairy farmers enroll their names on web portal e- Laabh" and milk poured by farmers is recorded on web portal. E-Laabh is Web based Benefit Management System designed for the welfare of Dairy Farmers. 2, 95,785 Milk producers are registered and are being benefitted under the programme. Milk procurement has increased from 1.27 lakh liters per day in the year 2014-15 to 5.60 lakh liters per day. Government is spending an amount of Rs.100.00 Crore annually. Milk Incentive is deposited in farmers' bank account through Direct Benefit Transfer.

Gross State Domestic Products at Current Prices of Livestock sector

Year	Livestock Sector (Rs. Crore)	Livestock Contribution %	Sectorial Growth Rate %
2014-2015	29282	6.3	17.7
2015-2016	33755	6.4	15.3
2016-2017	39816	6.6	18
2017-2018	46595	6.9	17
2018-2019	56384	7.3	21
2019-2020	67,131	7.6	19.1
2020-2021	94,211	10.52	32.3

ESTABLISHMENT OF MEGA DAIRY:

In order to improve collection and processing of milk production in the State, a Mega Dairy is established in 40 Acres land in Rangareddy District by Telangana Milk Federation under Vijaya Telangana Brand. Total Project cost is Rs. 246.5 Crore. The Project components include Milk Processing Capacity of 5 lakh liters per day expandable to 8 lakh liters per day, Modern Ice-cream plant of 5000 liters per day, UHT Brick pack plant of 1 lakh liters per day.

MOBILE VETERINARY CLINICS

Established in 2017, the state has 100 Mobile Veterinary Clinics, one per each Constituency and providing Veterinary services to the livestock farmers at door step, free of cost. Telangana is the pioneer of this project in the country. The project is being run by state financial Support. One Mobile Veterinary Clinic is stationed at strategic position in each constituency and is connected to Call Center. Farmer from rural areas can place a call to the Call Center through the toll Free Number – 1962, and inform about the sickness/ disease of his animal. The Call Executive transfers the call to Veterinarian who will analyse the case and allocate the same to the nearby Mobile Veterinary Clinics. Farmer will receive a message about the arrival of Mobile Veterinary Clinics which will provide veterinary Services at farmer's doorstep. Each Mobile Veterinary Clinic is equipped with One Veterinarian, one Para staff , one Attendant and One driver. All the 100 Mobile veterinary Clinics are equipped with GPS enabled system and their movement is monitored online. Government have spent an amount of Rs.130.00 Crore on this project so far. An amount of Rs. 35.00 Crore is spent for this project every year towards Veterinary services and medicines.

26,35,515 animals were treated under this project so far and 13,08,341 farmers have been benefitted. Government of India have appreciated this Model and allocated this project to all the States during 2021-22 under CSS. Officials / Public representatives from Karnataka, Jharkhand UP, Nagaland and Sikkim have visited Telangana and appreciated the Mobile veterinary Clinics. The Telangana Model is being replicated in other States also.

MILCH ANIMALS DISTRIBUTION PROGRAMME

Milch animals are being distributed to the members of Cooperative dairies on subsidy basis to improve milk production and milk collection in the State. The Unit cost of each milch animals is Rs.80,000/- which includes cost of animals, insurance and Feed. Government has spent Rs.343.50 Crore for this project. It is proposed to cover 31 district and 2, 13,917 beneficiaries under this Scheme and 59,616 Milch animals have been distributed on subsidy.

SHEEP REARING AND DEVELOPMENT PROGRAMME (SRDP):

The Government of Telangana has taken keen interest in small Ruminant Development through The Sheep Rearing Development Scheme (SRDP). It is one of the flagship programmes of Telangana State. The Scheme was launched to improve the livelihoods of Shepherd Community (Golla, kurma/Kuruva and Yadava) through Sheep rearing and to make the state self-sufficient in meat production, promote export of meat to other countries and to strengthen the Primary Sheep Breeder Cooperative Societies in the State with the financial assistance of National Co-Operative Development Corporation (NCDC), New Delhi. The Government of Telangana has introduced the scheme to develop the economic standards of the shepherd

communities to make it sustainable by supporting the traditional shepherd families with supply of (20+1) sheep units. 8392 Primary Sheep Breeders Cooperative Societies (PSBCSs) are functioning in the State and Members enrolled in the PSBCSs are 7,61,895. The project is being implemented in 2 phases to cover a total of 7, 31,368 members. The total project outlay for the first phase is Rs.5,000 crores and is intended to cover 4.0 lakh beneficiaries. The Scheme was commenced in the year 2017 and 3,39,389 members have been benefitted with supply of 3,92,340 Sheep Units. The sheep population has been increased from 1.28 crore to 1.91 crore by the induction of sheep under SRDP scheme and the same has been confirmed by the Govt. of India (20th Livestock census). So far, 130.00 lakh lambs were born and Rs.6500 crore worth has been accrued out of the lambs born. An additional 1.22 lakh Metric Tonnes of meat was produced through sheep distribution. There is an increase in meat production from 5.52 lakh Metric Tonnes to 7.54 lakh Metric tonnes.

The per capita availability of meat has increased from 12.95 Kg during 2014-15 to 21.17 Kg during 2020-21 due to increased mutton production. During the Second Phase, the Government intends to distribute Sheep Units to all the balance eligible members of primary Sheep Breeders Co-Operative Societies (PSBCS) in the State. The Scheme has shown multiple benefits by providing meat, income and livelihood thereby increasing state income.

MASS SHEEP DEWORMING PROGRAMME:

Sheep farming is the traditional livelihood for Kurma, Golla and Yadava communities and trans-nomadic way is practiced. Due to grazing habit on ground grass, parasitic worm load is one of the common problems in Sheep leading to poor growth and production loss. Worm load is also responsible for lamb mortality at early age leading to heavy loss to Shepherd community. Keeping in view of the above,

after formation of Telangana State Mass Free Sheep & Goat Deworming was taken up as a flagship programme to cover entire sheep and goat population. Mass Sheep & Goat Deworming is being conducted three time a year and deworming drugs are provided free of cost. This practice reduces worm burden and increase the meat production by one to one and half kg per Sheep. An amount of Rs.20.00 Crore is spent every year for three rounds of Mass Sheep & Goats Deworming programme.

BREEDING SERVICES

2118 Veterinary Institutions and 1414 Gopalamitras are providing Artificial Insemination services to dairy farmers. Telangana State is the best performing states in implementing the National Artificial Insemination Programme. The State has become self-sufficient in Buffalo Semen. The State has Frozen Semen Bull Station at Karimnagar. It is a state of the art ISO 9001:2015 Quality Management Certified Institution. The semen station houses 113 High Yielding Indigenous and Exotic bulls of various breeds of cattle and buffalo. Another semen station is under construction at Kamsanpally, Rangareddy district.

In-Vitro Fertilization Laboratory has come up at College of Veterinary Sciences, Korutla. 127 viable embryos have been produced.75 embryos are transferred into surrogate mother and 5 pregnancies are found positive. Sexed Semen Technology is introduced in the State on pilot basis. It is the latest Advanced Reproductive Technology in Artificial Insemination. The aim is to produce only female calves by completely eliminating the “Y” chromosome frozen semen.

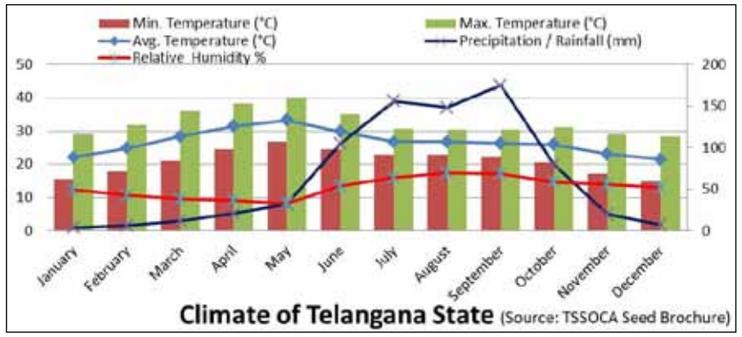
TELANGANA STATE VETERINARY BIOLOGICAL RESEARCH INSTITUTE

The institute was established as Serum Institute in the year 1944. GMP compliant & ISO Certified, this Institute is the first one to get license among 19 biological units under Government Sector. This Institute produces three types of bacterial vaccines and three Viral vaccines, some of which are supplied to surrounding states. The Institute is also a State Referral Laboratory for Animal Disease Diagnosis and Investigation. FMD, Microbiology, Pathology, Toxicology, Disease Monitoring & Surveillance and other related laboratories are established to carry out disease diagnosis. It is proposed to shift the institute from Shantinagar to IP Biotech Park, Phase II at Karakapatla, Markook mandal, Siddipet district.

TELANGANA SEED CERTIFICATION: STATE-OF-THE-AUTHORITY WITH GLOBAL STANDARDS

Telangana State Seed Certification Authority (TSSCA) was established in July 2014 after the state bifurcation with an objective to serve the purpose of Seed Certification in the State of Telangana.

The government of Telangana, since the formation of the State, has prioritised agriculture sector growth including the seed sector. Telangana is recognised as the Seed bowl of India and bestowed with congenial agro climate conditions, inclusive seed systems, skilled human resources, enthusiastic farmers, infrastructure, and better logistic facilities for quality seed production and storage, thereby catering to more than 60% to the Country's seed requirement besides its own requirement.



Climate of Telangana State (Source: TSSOCA Seed Brochure)

The Government of Telangana has taken up several new initiatives like strengthening of State Seed Sector Organizations, stringent seed quality assurance measures, establishment of scientific godowns, processing facilities, promotion of seed exports, establishment of seed testing laboratories etc. in the State.

In this direction, as per the vision of the Hon'ble Chief Minister of Telangana Mr. K. Chandrashekar Rao, the TSSCA has strengthened the organisation with respect to human resources, infrastructure, capacity, and capabilities, etc. to cater to the needs of Telangana and other States and has been working to realise the vision of making Telangana the Global Seed Hub.

TSSCA is an ISO 9001:2015 certified organisation with its headquarters at Hyderabad, and having five divisional offices across the state, two notified seed testing laboratories with good infrastructural facilities, adequate qualified human resources, and working with the following mandates;

Dr K Keshavulu
Director, State Seed and Organic Certification Authority

National Seed Certification

To maintain and make available high-quality seeds and propagating materials of notified crop varieties to the farming community through Certification Process. The task of Seed Certification is undertaken as per the Indian

Telangana International Seed Testing (TISTA) laboratory at Rajenadrangar, Hyderabad

Minimum Seed Certification Standards (IMSCS) published by the Central Seed Certification Board, Ministry of Agriculture and Farmers Welfare, Government of India.

International (OECD) Seed Certification

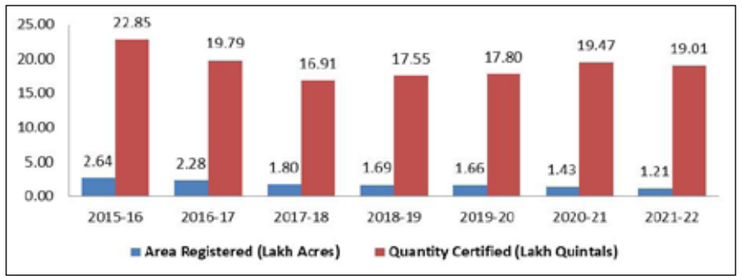
This is to implement the OECD Seed Schemes, which provides an international framework for certification of seeds moving into international seed markets and facilitating seed exports from the country. These are carried out as per the Rules and Regulations published by the OECD Seed Schemes Secretariat, Paris, France (https://www.oecd.org/agriculture/seeds/).

In view of the importance of organic farming in the present circumstance and to promote organic farming and encourage organic farmers in the State, the TSSCA has established organic certification authority to certify organic products as per guidelines of the National Programme for Organic Production (NPOP) and Participatory Guarantee System (PGS).

"Agriculture is the backbone of Indian Economy, and the Quality seed is the foundation for Agriculture"

Annually, TSSCA has been certifying about 1.5 to 2.5 Lakh acres of seed production area and about 18-20 lakh quintals of seeds of different crop varieties by involving about 40,000 seed farmers, more than 350 seed companies, and 440 seed processers. The seeds certified by TSSCA are having demand in the state as well as national seed markets and facilitating the supply of certified seeds to more than 10 States of the country like Andhra Pradesh, Tamil Nadu, Karnataka, Chhattisgarh, Maharashtra, Uttar Pradesh, Bihar, Orissa, West Bengal, Assam, etc.

In view of the Telangana State's seed production potential and also in line with the vision of making Telangana a Global Seed Hub, TSSCA has taken the following initiatives since its establishment in 2014.



Details of area registered and seed quantity certified by TSSCA

Digitalisation of Seed Certification & Seed Traceability

TSSCA for the first time in the country, implemented a complete online seed certification process and adopted modern IT technologies like digitisation of offices (e-office), seed traceability through QR coding, and Geo-tagging of field inspections to ensure transparency, accountability, and speedy services to the seed industry and also to ensure quality in the seed supply system. The adoption of modern IT technologies has reduced bogus seed production, especially in crops like Bengal gram and groundnut and simultaneously encourages genuine seed production under a certification programme.

For the first time in the country, TSSCA introduced a seed traceability system through QR codes on seed certification tags to ensure the genuinity of seed tags for the farmers, law enforcement authorities, and seed traders by enabling real-time verification through QR codes. Both the initiatives paved the way for other States to initiate the online certification process and implementation of seed traceability systems.

Paved the way for implementation of International (OECD) Seed certification in the Country

Though India became a member of the OECD Seed Schemes in 2008, much progress could not be achieved till 2016. In 2016, TSSCA as a designated authority initiated the registration

of seed plots and for the first time in the country facilitated seed exports to different countries of South Asia, the Middle East, and Africa under International OECD seed certification. As a result, the Government of India recognized the TSSCA as a leading designated authority for the southern states of India. In the field of international seed certification, the TSSCA has made commendable achievements like convening several national and international workshops and practical training programs for both public and private seed industry that paved the way for other states to initiate the international (OECD) seed certification.

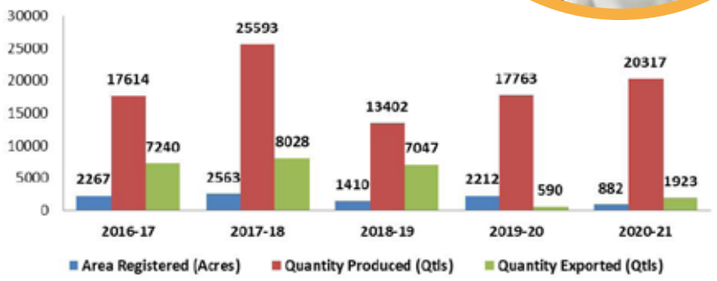
TSSOCA has established modern seed testing laboratory at Rajendranagar, Hyderabad with world-class state-of-the-art facilities for DNA fingerprinting/varietal purity testing, Protein Electrophoresis, Vigour testing, Viability testing, Seed Health tests etc. besides routine seed tests. The laboratory has obtained international (ISTA) accreditation and 'intends to cater to the needs of seed industry for domestic and export markets and help to boost the seed exports from the country.

Improvement in the capacity and capability of the seed industry:

TSSCA helped to build up the capability and capacity in the seed industry through several capacity building programmes/trainings on a wide range of topics like quality seed production, certification (domestic & OECD), testing, post-harvest technologies etc. to the seed industry personnel from both public and private sector including farmers. In addition, TSSCA has also launched a Bus (Vitthana Ratham) dedicated to educating farmers on quality seed production and encouraging the use of quality certified seeds to improve crop productivity.

"I want to develop Telangana as the Seed Bowl of the World in view of its excellent climate and the availability of Quality and Variety of Seeds"

Mr.K.Chandrashekar Rao
Hon'ble Chief Minister of Telangana



Details of seed exports under International (OECD) Seed Certification by TSSCA

"Implementation of an inclusive seed system approach in enhancing farmers' access to good quality seed"

Recognition from the FAO, Rome, Italy

The Food and Agriculture Organization of the United Nations (FAO), Rome, Italy has recognised Telangana as a Global Seed Hub and invited Director, TSSCA to present on "Quality Seed production systems: A Success story in India- Telangana State as Global Seed Hub" in the Global Conference of FAO held in the month of November 2021. It was a great opportunity and recognition for the Telangana Seed Sector at the global level for contribution towards FAO's vision and the implementation of the Strategic Framework, which seeks to leverage green innovations for the 'better crop production, nutrition, environment, and life' needed for a sustainable, inclusive and resilient agricultural production and food systems to current and future generations globally.

Director, TSSOCA heading the Global Seed Organisation (ISTA, Switzerland)

As a matter of pride for the Indian seed industry, Dr. K. Keshavulu, Director, TSSCA has been elected as the Vice President for 2019-2022 and President of the International Seed Testing Association (ISTA) recently in 33rd ISTA Congress-2022. He is the first ever person from Asia to become the Vice-President for the year 2019-22 and President for the year 2022-25 of the prestigious international organisation on seed science and technology. It is a great opportunity to improve international seed cooperation for India as well as for Telangana State.

"The Development of Agriculture and its allied sectors is imperative and the quality seed plays an important role in the development of the agriculture sector, in this direction the role played by TSSOCA is critical in accomplishing the goals that we have set."

Mr. Singireddy Niranjan Reddy
Hon'ble Minister of Agriculture,
Telangana State

Association with Global Organisations

TSSCA played a key role in the successful implementation of Indo-German Bilateral Project on Seed Sector Development as a regional partner. The project was intended to support the Indian seed industry in providing Indian farmers with high-quality seeds, with more focus on quality production, certification, processing and marketing of high-quality seeds by strengthening its competitiveness and improving the conditions of international cooperation and seed trade.

TSSCA has been coordinating with international organisations like ISTA, OECD, FAO, ISF, etc. on seed certification related aspects. It was an instrumental organisation in the successful conduct of ISTA Seed Congress-2019 at Hyderabad, which was organised for the first time in Asia. It has provided a global platform for about 500 delegates representing around 70 countries including India. The Indian agriculture sector, the seed industry, in particular, has benefited immensely from the ISTA seed congress in terms of updates on knowledge, skills, and latest technologies related to seed production and quality control.

Recognition at national and international levels

The innovative steps taken by TSSCA in the field of seed certification have been appreciated by delegates from different countries like Germany, the UK, South Africa, Bangladesh, Myanmar, China, etc., and Ministers for Agriculture of different states like UP, Bihar, Uttarakhand, Karnataka etc. In view of the above, the TSSCA has been adjudged as the Model Seed Certification Authority in the country by the National Seed Association of India in 2019 and Best Seed Certification Authority by Agriculture Today group in 2020.

"Certified Seed Does Not Cost, it pays"

TSSCA has emerged as a model seed certification authority in the Country within a short span of time with several transformative changes in the field of seed certification besides certification of 18 to 20 lakh quintals of seed annually, like strengthening of infrastructure, recruitment of technical staff, introduction of complete online seed certification system to ensure transparency, accountability, and speedy services to seed farmers and encourage genuine quality seed production. Seeds of different crop varieties are being certified by TSSCA, which are having demand across the country and thereby facilitating the seed supply to 10 - 12 neighbouring states.

In summary, the TSSCA has emerged into a multi-faceted organisation over the years and striving hard for the prosperity of the farming community across the country and to realise the great vision of making Telangana a global seed hub.

INDIAN INSTITUTE OF MILLETS RESEARCH

HERALDING MILLET REVOLUTION

The Indian Institute of Millets Research (ICAR-IIMR), Hyderabad, is a premier national agricultural research institute which conducts basic and strategic research of millets, while its 46 sub research centres of All India Coordinated Research Projects on millets across the country undertake applied research and pilot extension work in a network mode. The overall objective of IIMR is to enhance production, productivity and profitability of millets to enable the agricultural sector to accelerate the transformation of "subsistence farming" to "market and income-generation oriented" millet production system. Accordingly, IIMR focuses on resolving commodity-specific production constraints, matching agricultural, processing and value-addition processes and technologies to market opportunities which provide additional farm income and create off-farm employment especially in the semiarid tropical millet growing regions in India to usher in livelihood, food and nutritional security, thus justifying amply the need for public and private investment in millets research and development.

BOX I: Area under millet crops in Telanagana state during 2020-21

	Jowar	Bajra	Ragi	Total
Area (000 ha)	91	10	1	102.0
Production (000 ton)	155	9.3	1.04	165.3
Yield (kg/ha)	1711	930	1343	1621

(Source: DES, DA&FW, Ministry of Agriculture & Farmers Welfare, Govt. of India)

Dr. Vilas A Tonapi
Director, ICAR - Indian Institute of Millets Research, Hyderabad

Millets in Telangana

Millets are traditionally grown as the staple foods in most regions and also for fodder supply in Telangana state. Seed production of bajra and jowar hybrids and varieties is also a major activity in select districts of the state. Jowar is the traditional staple food of Telangana which has rapidly lost the loyalty, and is presently cultivated in only about 0.91 lakh ha producing 1.55 lakh tonnes of grain. The productivity can be further improved by replacing local varieties with improved ones. Bajra is grown in about 0.10 lakh ha, while ragi is confined to 1000 ha. Small millets such as foxtail millet and little millet are grown in limited area, all with lower yields as they are grown in marginal lands with not much attention and care.

The constraints for expanding cultivation of millets in Telangana are - limited productivity, low remuneration as compared to other competing crops, lack of input subsidies and price incentives, high drudgery involved in their processing, change in the consumer preferences, negative perceptions of small millets as a food for the poor and policy neglect when compared to other crops. However, if the income from secondary agriculture can be increased through value addition and enhancing awareness of health benefits of millets, farmers of the state can be substantially benefited.

The productivity of these crops has gradually been increasing due to crop improvement and adoption of high yielding varieties and improved production technologies. ICAR-IIMR has been working on these millets irrespective of their dwindling area, to be future ready. The real turning point was IIMR's diversification into value addition along with accelerated crop improvement research to revive millets in generating more demand for millets. Thus, a strong and viable value chain model has been developed and established around millets intensively working on various components such as Backward integration with technology backstopping with farmers for commercial production, partnering with ITC *e-choupal* and undertaking functions of on farm extension services, buy back, aggregation and storage functions and farm gate value addition through mechanisation of primary processing in PPP mode along with nutritional evaluation, processing diversification, entrepreneurship development, policy advocacy and creation of awareness on goodness of millets. Now, Millets are coming back on the food plate as superfoods/health foods, and gluten-free foods owing to growing health and nutritious food needs of urban sector. ICAR is ready at this point of time with improved varieties and hybrids, resource saving and yield optimizing technologies, and recent value chain solutions including farm gate value added processing technologies. But many challenges are ahead which include weak backward integration linkages, low productivity of small millets, accessibility of efficient processing facilities of small millets, farmer-market linkages, MSP for small millets and assured procurement policy, on which IIMR is working aggressively to ameliorate the limitations and enable the best way forward for millet revolution.

The real turning point was IIMR's diversification into value addition along with accelerated crop improvement research to revive millets in generating more demand for millets.

Encouraging Consumption

On the consumption front also, IIMR is taking the cause of millets with promotion of millets with consumers, and through sensitization of central and state government agencies for promotion of consumption (backed by production) of millets for health and for mitigating malnutrition. More than 60 Value added technologies for millet-based food products have been developed and licensed to entrepreneurs through Centre of Excellence of ICAR-IIMR. Millets Technology Business incubator (TBI), is institutionalised and branded as "Nutrihub" and is engaged with proactive measures to build a pipeline of entrepreneurs, so far handholding more than 300 millet-based start-ups

Interventions required under major components to enhance the incomes of millets farmers in Telangana

Intervention	Action points
a) Development initiatives for enhancing productivity of millets	• Provision of community seed system for quality seed production and supply within village clusters.
	• Incentives for nutri-cereals farming systems for cultivating millets.
	• Bringing more of fallow and wastelands under millets cultivation and increased cropping intensity in drylands.
	• Reduction in yield gaps and cost of cultivation of millets through technology transfer and adoption.
	• Identification and release of product and location specific millet varieties.
b) Generation of demand for millets through value addition and sub-sector development	• Branding of millets value chain
	• Development of value added and processed RTC/RTE product and process technologies
	• Development of millets processing machinery and technologies.
	• Provision of farm gate grading and dehulling facilities by providing machinery certified by institutions.
	• Provision of small ware housing for storage for clusters after creating FPOs.
	• Incentivizing millet value chains.
	• Promotional activities to generate demands for millets and millet based value added products.
c) Market and infrastructure development	• Development of steady integrated market support for millets.
	• Linking the local traders with national and international markets through various ICT initiatives like online market platforms (eNAM)
	• Marketing of millets products by tagging them as nutritional smart foods.
	• Entrepreneurship development by creation of direct linkages between the millets growers and budding start-up entrepreneurs.
d) Policy measures	• Regular procurement of millets through MSP.
	• Enhanced R&D support to address critical issues
	• Separate Millets Mission may be mooted.
	• Support facilities to FPOs and farmers for millets cultivation and support to develop community based seed enterprises.
	• Promotion of Special Agricultural Business Zone (SABZ) for Millets
	• Linkages with inter Govt. depts. Such as Health and nutrition, food processing ministries for better visibility and uptake of millets.
	• Identifying, creating and mapping crop colonies to create balanced production of crop commodities to get rid of problem of glut and scarcity.
	• Connecting all farmers to e-NAM.

During past five years about 400 start-ups sprang up in southern states and gradually this momentum is spreading northwards. With Government's National Mission on Nutricereals, ICAR has assumed a crucial role in its implementation in various states.

and their brands, which has received instant recognition and overwhelming response and several success stories are coming up. These start-ups are being connected with both the markets in niche and public funded captive markets. ICAR has enabled them to connect with Government e-market place (GEM).

The growth in this sector is commendable, and during past five years about 400 start-ups sprang up in southern states and gradually this momentum is spreading northwards. With Government's National Mission on Nutricereals, ICAR has assumed a crucial role in its implementation in various states. Now various state governments such as Karnataka, Odisha, AP, Tamil Nadu, Telangana, Maharashtra, Madhya Pradesh and Uttar Pradesh have either signed MoU or sought support of IIMR to strengthen their States' Millets Mission/Boards through technical backstopping with various stakeholders

Millets crop promotion and value addition programmes of IIMR in Telangana

- IIMR under the NAIP introduced the PCS value-chain on sorghum foods and end-product specific on-farm production was facilitated in Adilabad district under e-Choupal system of ITC Ltd.
- IIMR has been organizing training programs on post harvest value addition in millets to entrepreneurs as part of millet promotion activities for more than 7 years and about 500 participants of the state were benefitted.
- IIMR is empowering the FPOs in the states with new technologies of millets production and value addition for the promotion of the millets.
- IMR has been working with the NGOs in supply of cultivars to the millet tribal communities and also extending value added technologies on millet food products.

which is going to be path breaking with regard to millets promotion in their respective state.

Now the awareness about goodness of millets is spreading to the urban strata and also in rural clusters, encompassing middle and upper classes, and thus millets are back in grocery shops, part of retailing and online, and invariably make a good part of portfolio in organic food outlets. However, backward integration still remains a challenge. A major concern is that the profit due to demand generation through value addition has not percolated down to the farmers. Therefore, crop area remains either stagnant or slightly declined. At

Through value addition and enhancing awareness of health benefits of millets, farmers of the state can be substantially benefited.

this juncture, there is a great need to understand the current situation and debate on the ways and means to take forward the future prospects of millets.

Policy and incentive support for creating farmer producer organizations, farm gate warehouse and processing in village clusters, linking farmers to the value chains of both nutri-grains and nutri-fodder are already taking shape under NFSM Sub-Mission on Millets and Fodder Security Mission. Further, the platform of e-NAM can enable better price and incentivize farmers to produce more of millets adopting improved and sustainable technologies. *Niti Ayog* has already addressed policy issues such as procurement of millets, announcing of MSP for small millets, mainstreaming millets in public funded programs such as MDM, WCD etc. *Poshan Abhiyan* has included millets as one of its components to promote them as Nutri-cereals even at grass root levels by including them in the Nutrition atlas that is being prepared under this program. Most crucial factor is that creation of demand for millets should lead to enhancement of farmers' share in consumer rupee that will automatically catapult the area under millets cultivation substantially. However, all these efforts of ICAR-IIMR in partnership and collaboration with other departments of Govt of India such as DAC &FW, MHRD, APEDA, MOFPI etc., and partnering with the state governments is enabling the nation to produce surplus of nutricereals to confer cost efficient and environment friendly food and nutritional security, once all the policy initiatives on millets promotion are in right place. As we are gearing up to celebrate International Year of Millets in 2023, we are ready to offer our value chain expertise in millets to various Nations of the World to bring back these ancient Nutricereals to food basket of the globe to usher in nutrition security.

TELANGANA STATE AGRO INDUSTRIES DEVELOPMENT CORPORATION LIMITED

Supporting Telangana's Agriculture

Telangana State Agro Industries Development Corporation Limited (TS AGROS) was established on 15th April 2015. After bifurcation of the State, from 2015-16 to November 2020, Corporation's total turnover was only Rs. 77.53 cr (in 56 months) whereas Corporation turnover has gone up phenomenally and was increased to Rs.194.97 Crores upto October 2021 (in 23 months). As a result, vibrant activities were taken up by the Corporation from December 2019 to March 2021.

Dr. Chandra Shekar, Director General - MANAGE with ARSK Entreprenuers

Sri K Ramulu
Vice Chairman & MD,
Telangana State Agro Industries
Development Corporation Limited

LANDMARK ACHIEVEMENTS

Establishment of Agro Rythu Seva Kendras

TS AGROS have established 1016 Agro Rythu Seva Kendras (ARSKs) in the State to provide Employment Opportunities to the Unemployed Rural Youth who have acquired the qualifications of B.Sc (Agriculture); B.Sc (Horticulture); Diploma in Agriculture; Diploma in Horticulture; Diploma in Agriculture Engineering; B.Tech (Agril. Engineering) and Science Graduates with Chemistry, Botany and Zoology as Optional Subjects. Apart from this, Candidates who have DAESI Qualification from National Extension Management Institute (MANAGE) were also sanctioned Agro Rythu Seva Kendras. General Candidates have to deposit Rs.3.00 Lakh and Candidates of BC, SC & ST have to deposit Rs.1.50 Lakh towards Trade Advance to carry out Agri Input Business with the Corporation.

These Agro Rythu Seva Kendras (ARSKs) are mainly aimed at to cater needs of Quality Agri Inputs viz., Fertilizers, Seeds, Pesticides and Farm Machinery & Implements of the Farmers in Mandal Territorial Jurisdiction under one umbrella at affordable rates. A minimum of 3 ARSKs and a maximum of 6 ARSKs were sanctioned in each Mandal depending upon Population and Potential Cropped Area.

All the established ARSKs in the State are running on Sound Lines and became vibrant in supplying Quality Agri Inputs of all reputed National and Multinational Companies.

TS AGROS has entered into Memorandum of Understanding (MoU) with all reputed National and Multinational Companies for supply of Fertilizers, Seeds, Pesticides and Farm Machinery & Implements.

The ARSK Entrepreneurs

ARSKs have become a Role Model in the entire Country in providing Employment Opportunities to the Educated Rural Unemployed Youth. The Annual Business Turnover of newly established ARSK Entrepreneurs is ranges from Rs.50.00 Lakh to Rs.9-10 Crores. Thus, ARSK Entrepreneurs are earning a net income of Rs. 25,000-30,000 per month by carrying out Agri Input Trade.

There are 109 ARSK Entrepreneurs who have also acquired DAESI Qualification from National Extension Management Institute (MANAGE) and efforts are also being made to arrange loans under MUDRA.

ARSKs have become a role model in the entire country in providing employment opportunities to the educated rural unemployed youth

Each ARSK Entrepreneur is adopting nearly 100-150 Farm Families within the vicinity of 5-6 Villages and transferring the Latest Agriculture Technology to their Farmers to boost up Crop Yields.

TS AGROS is getting Cropwise Alert Messages during both the Cropping Seasons from the Regional Agriculture Research Stations of Telangana Agriculture University and the same is being communicated to all the ARSK Entrepreneurs all across the State.

Initiatives by TS AGROS to sustain ARSKs in the long run

- 45 Days Agri Clinics and Agri Business Centre (AC & ABC) Training has been imparted to the Qualified ARSK Entrepreneurs by MANAGE. Selected ARSK Entrepreneurs were given Theory and Practical Training pertaining to Business Skills and Attitudinal Behaviour with the End Consumers.
- After completion of training, these Entrepreneurs are being sanctioned loans by the State Bank of India (SBI) to the tune of Rs.10.00 Lakh without any Security and upto Rs.20.00 Lakh with Collateral Security. NABARD is sanctioning back ended subsidy of 36 % to General & OBC Entrepreneurs and 44% subsidy to SC, ST & Women Entrepreneurs on the loan sanctioned.
- Till now, 161 Entrepreneurs were trained in 45 days AC & ABC Training Programme.
- Out of 161 Trained Entrepreneurs, 60 Entrepreneurs were sanctioned loans by the State Bank of India, and NABARD has released subsidy to 27 ARSK Entrepreneurs for whom the loans were sanctioned. The process of scrutiny of applications for sanction of loan by the State Bank of India is in rapid progress.

Promotion of Natural Fruit Ripening Agent "En-Ripe"

TS AGROS have entered into MoU with M/s Heighten Innovative Solutions Private Ltd, Hyderabad for supply of En-Ripe towards artificial ripening of Mango, Guava, Banana and other fruits to stop the usage of Carbide / Ethephon for ripening which are harmful to human health. TS AGROS have supplied Pouches worth Rs.1.30 Cr to all the Major Fruit Markets across the State.

Promotion of Biodegradable and Compostable Products

TS AGROS have entered into a prestigious MoU with M/s Vertex Enterprises, Hyderabad to market the products like Bio-Degradable and Compostable items like Nursery Bags, Mulching Films, Carry Bags, Garbage Bags, Medical Waste Collection Bags, Cutlery, Napkins, etc., in order to discourage the usage of plastics in Telangana State. Tirumala Tirupati Devasthanam has accorded permission to open one counter at the abode of Tirumala Hills.

Promotion of Millets

TS AGROS has entered into MOU with M/s Indian Institute of Millet Research Centre, Rajendra Nagar, Hyderabad for promotion of Millets through which Women Entrepreneurs will be encouraged to establish Millet Counters in Hyderabad Twin Cities as part of Women Empowerment.

Promotion of City Compost (Telangana Siri)

TS AGROS is promoting City Compost along with Fertilizers as per the Policy of Government of India for improving fertility of Telangana Soils. The State Government has given directions to all Fertilizer Companies for supply of City Compost through TS AGROS.

PROMOTION OF OILSEED CROPS IN TELANGANA

The ICAR-Indian Institute of Oilseeds Research (ICAR-IIOR), formerly Directorate of Oilseeds Research was established on August 1, 1977 with the elevation of All India Co-ordinated Research Project on Oilseeds (AICORPO). With headquarters at Rajendranagar, Hyderabad, the Project Director was its administrative head with the assistance of seven Project Coordinators for groundnut, rapeseed-mustard, sesame & niger, linseed, castor, safflower and sunflower. Subsequently, groundnut and rapeseed-mustard were delinked from the Directorate with the establishment of National Research Centre for each of these crops during 1979 and 1993 respectively. In April 2000, the AICRP on sesame & niger and linseed have been separated from the administrative control of IIOR. With the upgradation of DOR to IIOR, sesame, niger and linseed has been added with the existing mandate crops such as castor, safflower and sunflower.

THE MANDATE

- **Basic and strategic research to augment the productivity, oil content and quality of castor, sunflower, safflower, sesame, niger and linseed.**
- **Information management on oilseeds to develop policy framework for research and development strategy.**
- **Coordination of applied research on national and regional issues to develop location specific varieties and technologies.**
- **Dissemination of technology and capacity building.**

Dr M Sujatha
Director, ICAR-Indian Institute of Oilseeds Research, Rajendranagar, Hyderabad

Potential areas for cultivation of oilseed crops in Telangana

	Soybean	Groundnut	Sunflower	Castor	Sesame	Safflower	Niger
Potential area	Adilabad, Nizamabad, Medak, Karimnagar, Ranga Reddy	Mahabubnagar, Warangal, Nalgonda, Karimnagar, Ranga Reddy, Khammam, Adilabad, Medak and Nizamabad	Nizamabad, Siddipet, Medak, Kama Reddy, Khammam, Mahabubnagar, Warangal	Mahabubnagar, Gadwal, Narayanpet, Wanaparthy, Rangareddy and Nalgonda	Jagtial, Ranga Reddy, Nizamabad, Mahabubnagar, Karimnagar, Khammam and Warangal	Adilabad, Nirmal, Nizamabad, Vikarabad	Ranga Reddy Vikarabad
Cultivars	JS-335, J S-93-05, Basara	TG 37A, Kadiri-6, Kadiri- 9, Kadiri-7 (bold) & Kadiri-8 ICGV 91114, Ananta, Dharani, Amaravathi, Kadiri Harithandra, Kadiri Lepakshi, Girnar-4, Girnar-5	DRSH-1 NDSH-1012 Private hybrids	ICH-66, PCH-111, DCH-519, DCH-177, GCH-7, GCH-8	Swetha Til, YLM-66, Chandana and Hima, JCS 1012, JCS 2454, JCS 2696 (Late Kharif)	ISF-764, PBNS-12, NARI-96, TSF-1	JNS-9, JNS-28
Problems	Availability of quality seed Yellow mosaic virus	Wild boars, leaf spots, red hairy caterpillar, root grub emerging problem collar rot	Availability of quality seed, Necrosis, Bird damage	Botrytis, semilooper, capsule borer	Availability of quality seed Phyllody Gall fly	Availability of quality seed Aphid infestation, Incidence of wilt	Availability of quality seed of latest varieties, Cascuta infestation

Outreach activities

The institute also implements several outreach activities like the Tribal Sub Plan (TSP) and Scheduled Caste Sub Plan (SCSP) at National level on oilseed crops for improving the livelihood status of ST and SC beneficiaries. The Institute organizes regular capacity building programmes to agricultural officers, farmers and other stakeholders at National level. Agri-business Incubation (ABI) centre of the Institute organizes regular entrepreneurship development programmes for the benefit of rural and unemployed youth. The Institute has a network of All India Coordinated Research Project (AICRP) centres on six oilseed crops *viz*., castor, sunflower, safflower, sesame, niger and linseed spread across all the oilseed growing states of India. The AICRP centres are involved in the generation of location specific cultivars, production and protection technologies on oilseed crops.

Strategies for promotion of oilseed crops in Telangana

Oilseed crops play an important role in the agricultural sector of the state. Oilseed crops were grown in an area of 4.67 lakh acres during *kharif* and 3.70 lakh acres during *rabi* season (2021). The major oilseed crops grown in the state are soybean, groundnut, sesame, sunflower, castor, safflower and niger. The productivity of oilseeds is far below the national average and there is tremendous scope for improving the productivity (30%) as observed in the frontline demonstrations conducted by ICAR-IIOR in Nizamabad, Adilabad, Mahabubnagar, Nagarkunool, Wanaparthy, Narayanpet, Khammam, Warangal and Karimanagar districts.

ICAR-IIOR, Hyderabad is one of the Cluster Based Business Organizations (CBBOs) for facilitating the formation of "Farmer Producers Organization (FPOs)" under the Central Sector Scheme on "Formation and Promotion of FPOs" by National Cooperative Development Council (NCDC)

AICRP, Seed hub, FLDs and FFP activities in Telangana

ICAR-Indian Institute of Oilseeds Research is involved in development of improved cultivars, production and protection technologies and transfer of oilseed technologies to farmers in Telanagna State through a network of AICRP centres and implementation of various projects. The institute supports four AICRP centres in Telangana for conducting need based research and developing location specific technologies for promotion of oilseed crops.

Apart from this, the institute is the nodal centre for oilseed seed hub project for production of quality seed (breeder/ foundation and certified seed) of oilseed crops and farmer participatory seed production is given priority in the project. The castor, safflower and sunflower seed is being produced in farmers' field in Nagar Kurnool, Vikarabad and Karimnagar districts. ICAR-IIOR is effectively implementing the TSP in aspirational district (Adilabad) and SCSP in Mahabubnagar, Nizamabad, Jagitial and Siddipet districts of Telangana.

The institute organises FLDs on oilseed crops to show the productivity po-

tential and profitability of improved technologies in farmers' fields in various districts of the State. IIOR has promoted and popularized bee keeping in sunflower in Nizamabad district. The capacity building of farmers, officers of agricultural department and other stakeholders are being organized at regular intervals in regional language. The Institute is also involved in organizing field days, exhibitions and farmers-scientists interactions regularly.

The institute has adopted four villages *viz*., Gattepalli, Rampur thanda, Aampally, Gurudhotla in Darur mandal of Vikarabad district under "Farmers First Project (FFP)" and striving to improve the overall productivity of the crops and increasing the income of farmers.

Formation and Promotion of Farmer Producer Organizations (FPOs)

ICAR-IIOR, Hyderabad is one of the Cluster Based Business Organizations (CBBOs) for facilitating the formation of "Farmer Producers Organization (FPOs)" under the Central Sector Scheme on "Formation and Promotion of FPOs" by National Cooperative Development Council (NCDC). Two blocks *viz*., Narayanaraopet and Chinnakodur of Siddipet district, Telangana State with focus on oilseeds and horticulture were identified for the formation of FPOs. The objective of the FPOs was based on one product-one district and the major focus is on developing a complete value chain of oilseed crops. The "*Chinnakodur Ryhtu Uthpathidarula Paraspara Sahaya Sahakara Sangam Limited*" was the first FPO registered by digital means under Telangana Mutually Aided Cooperative Societies Act, 1995 in Siddipet district, Telangana State and the second FPO *"Bugga Rajeshwara Swamy Ryhtu Uthpathidarula Paraspara Sahaya Sahakara Sangam Limited"* was registered in the month of October, 2021. Around 1150 farmers with small and marginal land holdings were mobilized in the two FPOs and more are keen to join the FPOs. The two FPOs achieved a business turnover of Rs. 25,00,000/- (Rupees twenty five lakhs) by way of purchase and sale of sunflower seed, seed production of groundnut and paddy and earned a profit of around 7,50,000/- during the first year itself.

ICAR-IIOR has identified the potential districts for each of the oilseed crops in Telangana State and is striving for complete value chain development of oilseed crops with the collaboration of all stakeholders.

Agri Business Incubation (ABI)

The institute is regularly organizing entrepreneurship development programmes on soil health management, seed production, bio-pesticide production, oil expelling and value addition in oilseed crops for rural and urban youth, and handholding them in developing suitable enterprises.

ICAR-IIOR has identified the potential districts for each of the oilseed crops in Telangana State and is striving for complete value chain development of oilseed crops with the collaboration of all stakeholders.

STREAMLINING MEAT RESEARCH IN INDIA

The ICAR-National Research Centre on Meat, Hyderabad is premier institution devoted fully to meat research in the country. The Institute was created with the main emphasis on value addition, quality attributes of fresh and processed meat, imparting education, training, and attention towards sanitary and phytosanitary measures in the slaughter of animals and meat production. These are being achieved through scientific and technological support to develop knowledge and skills through the participatory approach of farmers, entrepreneurs, and scientists. Besides research, NRC on Meat is conducting entrepreneurial training programs, awareness programs, workshops, and regular interactive meetings with officials from line departments. The Institute also undertakes analytical services and provides bankable project reports to interested entrepreneurs in establishing meat products processing units. The Institute also exhibits its technologies and different meat products at various locations for wider reach among the public. Overall, NRC on Meat is striving hard to address the issues related to meat animal producers, meat processors, and consumers.

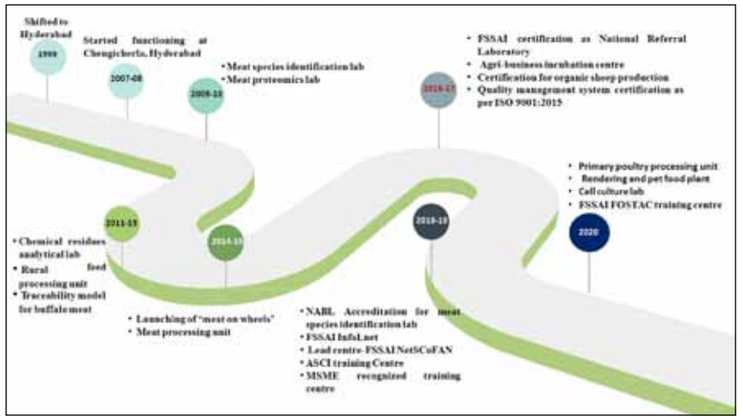
NRC on Meat has also initiated research on organic meat production, meat species identification, portable hygienic slaughtering facilities and traceability in livestock sector.

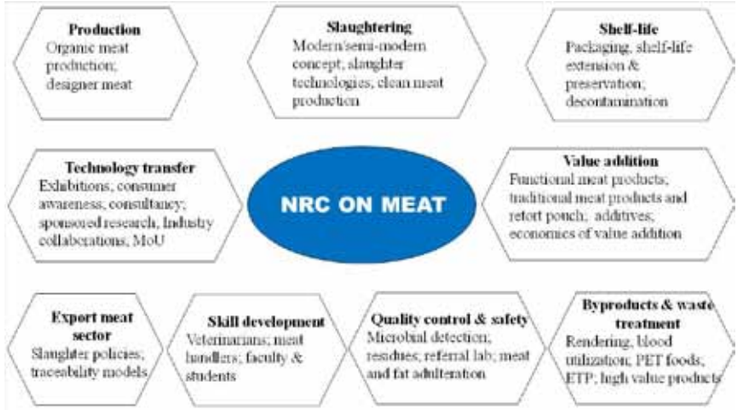
NABL Accredited Meat Species Identification Laboratory

ICAR – National Research Centre on Meat established an ISO/IEC 17025: 2017 NABL accredited Meat Species Identification Laboratory (MSIL) laboratory for the testing of meat and meat products through molecular biomarker analysis. The scope of the accreditation includes molecular biomarker analysis of animal and wildlife meat species identification and halal compliance by detection of porcine DNA in meat and meat products. It is also one of the National Referral Laboratories for the Food Safety and Standards Authority of India (FSSAI) for meat and meat products. The laboratory serves as a competent species identification laboratory, analyzing more than 430 samples from various government bodies like AQCS, FSSAI, customs, animal husbandry, forest,

Dr. SB Barbuddhe
Director, ICAR-National Research Centre on Meat, Hyderabad

Milestones in the development of ICAR – NRC on Meat, Hyderabad





and police departments all over India. Further, private companies and individual customer samples are also handled by the laboratory time-to-time. With high-end instruments and competence in both forensic testing and research, the laboratory has performed several salient research with prominence in food fraud (especially economically motivated adulteration), forensic identification, and cases with unconventional meat.

Organic meat production system for sustainable sheep husbandry and promotion of consumer health

Due to increasing concerns of consumers about the safety of the foods, the importance of organic foods is increasing consistently among the health conscious niche consumers. For the first time in India, ICAR NRC on Meat in collaboration with ICAR- CRIDA has taken up rearing of sheep for meat purposes and to certify it under organic protocols as per NPOP guidelines as a demonstration of the organic livestock production and certification process to the farmers and entrepreneurs. Since feeding of certified organic fodder is an essential component of rearing organic sheep, a barren land of 2 acres (0.8ha) was developed into an organic fodder unit. Certified fodder is used for organic sheep rearing. After the due conversion period, the sheep unit was organically certified under NPOP guidelines for the first time in India through APEDA accredited certifying agency.

For the first time in India, ICAR NRC on Meat in collaboration with ICAR- CRIDA has taken up rearing of sheep for meat purposes and to certify it under organic protocols as per NPOP guidelines as a demonstration of the organic livestock production and certification process to the farmers and entrepreneurs.

The certified fodder and sheep units are now serving as model demonstration units for the interested farmers and entrepreneurs to learn and establish their own units. ICAR- NRC on Meat is regularly organizing awareness programmes and lectures on organic livestock production and certification process to popularize and promote organic livestock production in the country.

Meat traceability for quality assurance and wholesome meat production

ICAR – National Research Centre on Meat, Hyderabad has developed a complete system for tracing buffalo meat in the value chain. The system involves identification of buffaloes by ear tagging using the International Committee for Animal Identification and Recording (ICAR) approved number and traceability labeling of meat by using bar coding. For the identification of farms and abattoirs, a PIN code-based identification number was designed. A livestock traceability database (www.livestocktraceindia.in) which enables storage of information of animal, farm and abattoir on web-based database has also been established. The database provides provision for enrollment of animals, farms, abattoirs, veterinarians, and meat processing plants. This was the first meat traceability system ever developed in India. The traceability system was implemented on a pilot scale in different farms and abattoirs. ICAR NRC on Meat has released a policy paper on meat traceability and the Institute has been recognized as a Nodal Institute for implementation of meat traceability in India by the Department of Animal Husbandry and Dairying, Govt. of India. The institute has also worked on block chain based traceability in buffalo meat sector. This will go a long a way in helping the farmers to get premier price to their produce.

Technological interventions for quality improvement of traditional/ethnic meat products

A pilot-scale production technology for Hyderabadi Haleem was conceptualized to enhance the quality, shelf-life, and microbial safety of Hyderabadi Haleem through new processing/packaging interventions. In this study, technical observations were made on methods, ingredients, particle size, cooking methods, mixing, and endpoint of cooking. Accordingly, a laboratory method was standardized. With this method, haleem could be prepared within 3-4 hours and can be made available throughout the year.

Use of nanotechnology to combat antimicrobial resistance in poultry

ICAR NRC on Meat has initiated research on identification of specific phytochemicals against multi-drug resistant pathogens, their conjugation, and/or encapsulation using appropriate nanoparticles and polymer for their targeted delivery in poultry.

Innovative Portable Meat Production and Retailing Facility (P-MART) for Sheep and Goats

To promote hygienic meat production, ICAR – NRC on Meat, Hyderabad has developed Portable Meat Production and Retailing Facility (P-MART). This facility enables production of hygienic meat with minimal investment. A bio gas plant is provided with every P-MART for disposal of green waste and production of biogas. This is an attempt to decentralize the slaughtering facilities at farmer/entrepreneur level for hygienic meat production.

Portable Meat Production and Retailing Facility (P-MART) for Sheep and Goats

Supply of inputs under DAPSC scheme

Backyard poultry units were provided to 505 SC women belonging to eight districts of Telangana for additional income generation and livelihood improvement. Each unit comprised of 20 four weeks old improved backyard poultry birds, 20 kg feed, one waterer and one feeder. They were given complete orientation on management, housing, feeding and health care of the birds.

Under Scheduled Caste Sub Plan (SCSP) about 13,000 chicks distributed to about 650 rural women along with 13 tonnes of poultry feed and 650 feeders in Telangana state. About 8 training programs were organized benefitting 160 stakeholders. Five small scale meat processing units were established in Siddipet, Jangaon, Khammam, Aushapur and Korutla benefitting about 50 women SHG members.

Promotion of entrepreneurship through Agri-Business Incubator

The Agri Business center has been established with the objectives to generate employment opportunities and promote viable enterprises in meat/poultry processing through the establishment of an integrated poultry processing plant in a complete value chain and also to undertake scaling up of pilot level meat processing technologies into a commercial level of the value chain through skill up-gradation, technology transfer, capacity building and handholding of prospective entrepreneurs in agribusiness ecosystem with special emphasis on the meat value chain. Facilities for chicken carcass chilling, portioning, and packing have been established. To date, the ABI Unit has facilitated the signing of 35 agreements for providing consultancy for the establishment of value-added meat products processing unit and rendering plant for utilization of slaughterhouse byproducts. There were 61 training programmes organized covering clean meat production and the development of value-added meat products. The technologies developed at this institute were displayed at exhibitions conducted in various parts of the country. Under ABI, various publications, e-learning material, folders, technical bulletins and videos were published for popularization technologies and creation of awareness.

One Health approach for food safety and zoonoses

ICAR NRC on Meat is a part of a consortium of infectious disease and public health researchers funded by Department of Biotechnology, Govt. of India who initiated a One Health programme with the ultimate objective of establishing inter-sectoral collaborations among veterinary, medical, agricultural, environmental, forestry, meteorological and other areas to detect, prevent and control zoonoses, foodborne infections and transboundary diseases. The One Health approach has been implemented for food safety.

In Pursuit of Plant Genetic Resources Management in Telangana

The ICAR-National Bureau of Plant Genetic Resources (NBPGR) is the nodal organisation mandated with planning, execution and coordination of all activities concerned with plant germplasm collection, introduction, evaluation, exchange, quarantine, conservation and documentation at National level to facilitate its sustainable management and use on a continuous basis by the breeders and researchers in India and elsewhere.

ICAR-NBPGR Regional Station, Hyderabad was established in 1985, with the major responsibility of quarantine processing and clearance of crop germplasm in Southern Region of India. It caters to the needs of plant genetic resources management in biodiversity hotspots in South East Coastal (SEC) zone with special reference to the Eastern Ghats and tribal pockets. It has an experimental farm and office cum laboratory facilities for PGR Research and Quarantine processing of import and export germplasm for release of disease-free material. Since inception in 1985 the plant genetic resources (PGR) activities gained momentum and the awareness on PGR conservation and utilization has tremendously improved.

Plant Quarantine Activities

NBPGR is the nodal agency for safe exchange of germplasm in the country and its regional station at Hyderabad, provides quarantine service to more than 50 public sector, private and international organisations in South India. It has been in the forefront of preventing the entry of exotic pests, which are a major threat to agriculture, thus safeguarding farmers' interests. Over 14, 00,000 samples were processed for quarantine clearance (imports & exports) and more than 3,400 Phytosanitary certificates were issued for export consignments. Over fifty pests of quarantine significance were intercepted on imported germplasm.

Collection and Conservation of Plant Genetic Resources from Telangana

Telangana state is part of the Indian gene centre and the Regional Station of ICAR-NBPGR at Hyderabad has undertaken more than 60 collection missions to augment and conserve genetic resources to the tune of more than 7500 accessions including ITK in different agri-horticultural crops and their wild relatives mostly from tribal and other diversity rich areas.

A total of 7,770 accessions of germplasm diversity of different agri-horticultural crops belonging to several crop groups from the state of Telangana are under long term conservation in the National Gene Bank at NBPGR. Maximum diversity was augmented and conserved in oil seed crops followed by pulses, millets and vegetable crops. In individual crops, the maximum diversity conserved was in sorghum (782 accs.) followed by rice (479 accs.), Green gram (368 accs.), Chilli (298 accs.), Castor (267 accs.), Maize (265 accs.) and Cowpea (255 accs.) from the state of Telangana.

Dr. N Sivaraj Principal Scientist and **Dr. Anitha Kodaru,** Principal Scientist & Officer-in-Charge, ICAR-National Bureau of Plant Genetic Resources, Regional Station, Rajendranagar, Hyderabad

Sorghum crop diversity collected by ICAR-NBPGR from Telangana

Seed materials of different agri-horticultural crops of orthodox nature is stored at -20°C with the seed moisture brought down to 5 - 8% and RH being maintained at 25 - 32% at National Gene Bank, New Delhi. In some difficult species, which are recalcitrant, pollen and seed material is stored at -180°C in liquid nitrogen in the cryo tanks at the National Gene Bank. For medium term conservation, the seed material is stored at 5°C with the seed moisture brought down to 5 - 8% and RH being maintained at 25-32% in the cold storage modules at NBPGR Regional Station, Hyderabad. The crops which are multiplied by vegetative means and medicinal plant species which are non-seed bearing (stem cuttings/ root cuttings/ whole plant) are being maintained in the Glass house/ Field gene bank at NBPGR Regional Station, Hyderabad in live condition. Major concern in conservation is, shrinking of distributional area of endemic diversity at a faster rate due to various bio-edaphic/ ecological and socio-economic reasons. Rehabilitation of such endemic genetic resources wealth by adopting *ex-situ* or *in-situ on-farm* measures is desirable for vast majority of crop species. ICAR-NBPGR has processed over 40,000 accessions of ICRISAT mandate crops meant for conservation in Svalbard Global Seed Vault maintained under Global Crop Diversity Trust in Norway.

Inspection of crop germplasm at ICRISAT by ICAR-NBPGR staff meant for conservation in the Svalbard Global Seed Vault

PGR Characterization and Evaluation

Over 15,000 accessions of mandate and other crops including sorghum, small millets (finger millet, little millet, Italian millet, kodo millet, barnyard millet), browntop millet, pulses (blackgram, greengram, horsegram and wild legumes), oilseeds (sesame, linseed), vegetables (brinjal, tomato, yardlong bean, cowpea) and spices (chilli) was characterized and evaluated. Identified elite and promising accessions/ genetic stocks in Chilli (sources of resistance to thrips, mites, anthracnose, nematodes), Cluster bean (gum content), Sorghum, Black gram (long pods, stable high yielding), Linseed (high oil and omega-3 content), Brinjal (Coreset development), Pongamia (High seed oil and four seeded pods) and in other crops. Diversity analysis using geographical information system was carried out for several crops and mapping of crop landraces belonging to Telangana was carried out by the station.

Empowering Ethnic Groups through Farmers' Variety Protection

In order to create intellectual protection,

Brinjal diversity characterized and evaluated at ICAR-NBPGR, Hyderabad

value enhancement and benefit sharing to the farming communities, diversity rich elite landraces/farmers' varieties were identified in endemic native crops from Agri-biodiversity of Telangana. Regional station, Hyderabad, facilitated the protection of farmers' varieties (pigeonpea-1; sorghum-2; greengram-1) thus, enhancing livelihood security. Guaranteed Access and Benefit sharing mechanism would be applicable on the protected varieties facilitated through ICAR-NBPGR Regional Station.

Soft protection to agri-biodiversity from Telangana state by registering elite germplasm with Indian Council of Agricultural Research was also carried out. Scientific Team of the station has so far registered the following elite lines from Telangana

- Greengram – INGR13010 – Photosensitive accession
- Linseed – INGR10027 – Accession with high oleic acid (32.0%)
- Linseed-INGR10028- High oil content (42.6) and Omega-3 (54.8%)
- Chilli-INGR14041-Anthracnose (*Colletotrichum capsici*) resistant line
- Bottlegourd – INGR10064- Accession with rare and unique spindle shaped fruits
- Jatropha-INGR08087-Accession with high oil content (42.9%)

Contribution to release of New Varieties

ICAR-NBPGR Regional station has contributed to the release of new varieties in Cluster bean (*Telangana Gokarakaya*-1) and yardlong bean (*Bhagyanagar Podugubobbarlu*-1) in association with Sri Konda Laxman Telangana State Horticultural University. Further, NBPGR Regional Station contributed to suitable technology development by way of release of new varieties in Rice (1), Sorghum (1), Coriander (3), Yardlongbean (2) in association with other SAUs/ICAR Institute.

Facilitating introduction of new useful Crops- A success story of dragon fruit

NBPGR, Hyderabad facilitated the introduction of 40 varieties/hybrids of exotic dragon fruit accessions from Philippines. Dragon fruit is a unique exotic

Dragon fruit [clock-wise -Habit, stem with roots, flowers, cut fruit, fruits, floral buds]

health fruit that can be cultivated with poor resources of degraded lands and rainfed regions of India. In recent days, dragon fruit has been emerging as a super crop in the horticultural sector and has an export potential. The contribution by ICAR-NBPGR would help in managing exotic dragon fruit crop genetic resources in the country by formulating suitable sustainable crop cultivation strategies and highly useful in micro-level planning of cultivation in degraded lands which in turn will help the farmers to increase their livelihood security in the changed climatic regime. Dragon fruit has got potential to grow in diversified agro-climatic regions of India, thus ensuring food security and increased income to farming community. Due to high demand both in domestic and international markets; dragon fruit production could be an economical avocation to both backyard growers as well as entrepreneurs of medium and large scale plantations. The level of risk in producing the exotic crop is lesser and to some extent more tolerant to adverse weather conditions as compared to the production of other high-value commercial horticultural fruit crops.

Awareness generation on Agro-biodiversity Conservation

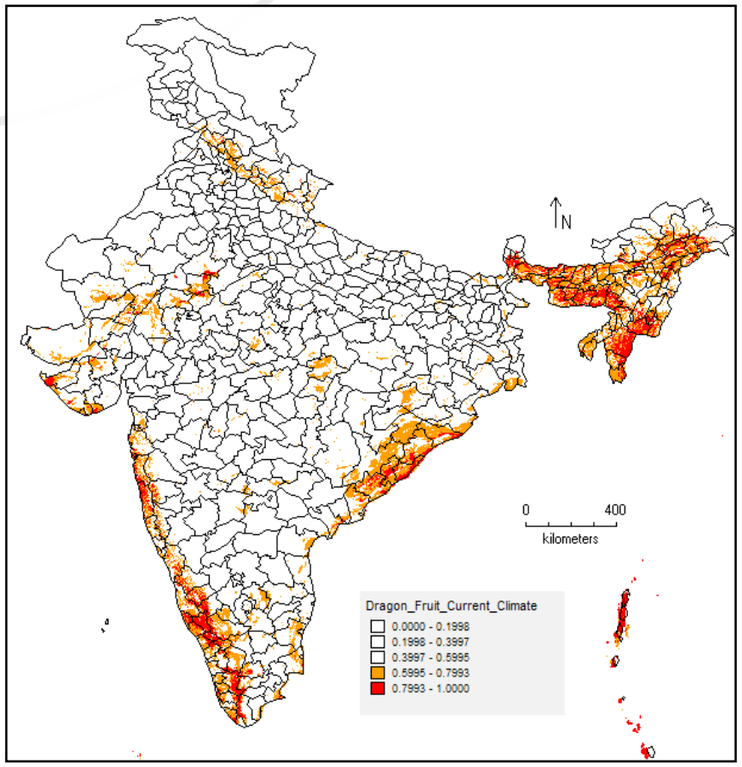
ICAR-NBPGR Regional Station has been instrumental in creating awareness among farming community of Telangana and Andhra Pradesh on several PGR aspects viz., Collection, conservation and utilization of crop genetic resources etc. It has held over 25 grassroot level awareness programmes on PGR in tribal pockets encouraging participation of tribal womenfolk. Consistent efforts impacted the tribal populations as they recognized the necessity of conservation of plant biodiversity not only for immediate crop improvement and sustainable environment but also for livelihoods and sustainability. These programmes were conducted under National Agricultural Technology Project (NATP), National Agricultural Innovation Project (NAIP), Telangana State Biodiversity funded

On-farm conservation of Agro-biodiversity (Plant genetic resources)

- *In-situ* on-farm cultivation of farmers' varieties on smallholder farms provides a valuable option for conserving crop diversity for sustainable utilization. It helps to sustain evolutionary systems that are responsible for the generation of genetic variability.
- Significant in many parts of diversity rich tribal pockets and resource poor dryland areas of Telangana.
- Areas are subject to drought and other stresses, because it is under such environmental extremes that variations useful for stress-resistance breeding are generated.
- Access to a wide diversity in local seeds probably provide the only reliable source of planting material that is locally adapted and conditioned by their inherent broad genetic base.

Challenges

- Efforts on PGR (plant genetic resources) characterization and realization of the potentials
- Research in *in situ* and on-farm conservation
- Awareness about PGR management in context of climate change
- Efforts for harmonization of plant genetic resources conservation and agrarian reforms
- Knowledge about optimum level of PGR conservation
- Information on valuation of genetic resources for conservation and use in context of climate change
- The negative impacts of climate change on species and ecosystems are exacerbating the effects of other pressures on biodiversity



Climate suitable regions for the cultivation of dragon fruit

Project, Tribal Sub-Plan and SC-SP programmes.

Climate change mitigation activities

Climate change causes warmer summer temperatures and inconsistent precipitation patterns. Rapid and uncertain changes in rainfall patterns and higher temperatures can also result in geographical shifts of crops and cropping patterns through changes in seasonal extremes, as certain species can no longer be cultivated in certain regions. Climate change can disrupt food availability, reduce access to food, and affect food quality. For example, projected increases in temperatures, changes in precipitation patterns, changes in extreme weather events, and reductions in water availability may all result in reduced agricultural productivity. ICAR-NBPGR Regional Station, Hyderabad has assessed climate suitable regions for cultivation of crop landraces *viz.*, Sorghum, greengram, blackgram, wild sesame, roselle, sorrel, banana, dragon fruit and others in the climate change regime, using suitable technologies (Geographical Information System, Ecological Niche modelling, Bioclim approaches).

**The research activities mentioned in this compilation are the contribution of many other scientists who have worked for ICAR-NBPGR, RS, Hyderabad and other institutes of ICAR and State Agricultural Universities. The authors are indebted to all of them and acknowledge Director, ICAR-NBPGR, New Delhi and Head, Division of Plant Quarantine, ICAR-NBPGR, New Delhi for their support.*

P. V. Narsimha Rao Telangana Veterinary University was established on 22nd November, 2014 at Rajendranagar, Hyderabad-500 030, Telangana for focussed development of Animal Husbandry and Allied Sectors. The University offers Diploma, Graduate, Post-graduate and Doctoral level courses in the field of Animal Husbandry and Veterinary Sciences besides offering Graduate programmes in the fields of Dairy Technology and Fishery Science. There are three Colleges of Veterinary Science under this university located at Rajendranagar, Korutla and Mamnoor; one each of College of Dairy Technology at Kamareddy and College of Fishery Science at Pebbair and four Animal Husbandry Polytechnics. Besides, there are two Livestock Research Stations, One Poultry Research Station and one Fishery Research Station. One Krishi Vigyan Kendra is extending extension support to the farmers of Telangana.

P. V. NARSIMHA RAO TELANGANA VETERINARY UNIVERSITY

Focussing on development of Animal Husbandry and Allied Sectors

Government of Telangana has recognised Animal Husbandry sector as a growth engine and unleashed a plethora of developmental programmes in the fields of Animal Husbandry and Fisheries. In tune with the objectives and to augment the manpower needs of the state, the University has started the third Veterinary College at Mamnoor of Hanamkonda district and the first ever Fishery Science College in the state at Pebbair of Wanaparthy district. Hon'ble Chief Minister has recently announced the establishment of three more Veterinary Colleges in the State.

This University has produced 540 Diploma students, 895 Graduates and 335 Post-graduates including Doctoral scholars who are serving the state's livestock sector. A substantial number of students have undergone advanced training at National and International institutes and are contributing to Animal Health, Animal Production, Poultry, Feed industry, Food processing etc. in India and abroad. The quality of education at this University is demonstrated by the good number of students securing seats and fellowships at National and International level.

Research Excellence

Notable among the achievements of this young University are the development of **Rajasri,** a synthetic poultry variety suitable for backyard farming, development of area specific mineral mixture, research on animal health and production including development of vaccine against bluetongue, establishment of feed quality analytical laboratories to cater to the needs of livestock and poultry farming communities, conservation and popularization of native breeds of cattle through embryo transfer and *in vitro* fertilization and establishment of Gokulgram under Rashtriya Gokul Mission.

Dr. Vangur Ravinder Reddy
Vice Chancellor, P. V. Narsimha Rao Telangana Veterinary University

Rajasri is a synthetic poultry variety suitable for backyard farming. It is a multi colored improved dual purpose bird which thrives on scavenging and produces about 160 eggs per annum under backyard conditions. This has found favour with farmers of the state and also of adjacent states. More than 15 lakh birds have been supplied to farmers under various programmes such as Tribal Sub-Plan, Farmers First etc. Recently, Hon'ble Governor has flagged off vans carrying Rajasri birds from this University to primitive tribal groups under the Project *Nutritional intervention in primitive tribal groups.*

Mineral deficiency is a major cause of reproductive and productive under performance of livestock and geographical locations differ in the mineral status in feeds and fodders. To address this, the state of Telangana has been surveyed and area specific mineral mixture is formulated to cater to the needs of different geographical locations. This mineral mixture is being supplied to farmers at a minimal cost and 20 MT of mineral mixture has been supplied.

Conservation and Popularization of native breeds of cattle has got a big push at this University with the sanction of Gokulgram and Embryo Transfer and In Vitro Fertilization (ET-IVF) Projects under Rashtriya Gokul Mission. As part of this, a state of the art Dairy Farm with facilities for research on special attributes of native cows is being created at Rajendranagar campus. Further, ET-IVF laboratory is established at Korutla campus, Jagtial district where superior embryos of Sahiwal breed of cattle are produced and transferred to native cows owned by farmers, to improve the genetic potential of cattle available in the field.

Poultry Seed Project, an ICAR funded Project is in operation at Mamnoor of Hanamkonda district. It aims at multiplication and supply of improved backyard poultry varieties to rural farmers in the state. Under this Project, about 2 lakh day old chicks have been supplied to farmers during the last three years.

Invested in Infrastructure

University has established two state of the art feed analytical laboratories for

"This University has produced 540 Diploma students, 895 Graduates and 335 Post-graduates including Doctoral scholars who are serving the state's livestock sector"

the benefit of farmers, one each at Rajendranagar and Korutla campuses with financial assistance under RKVY. These laboratories provide fast and reliable feed quality analysis facility for livestock and poultry farmers.

A state of the art Veterinary Hospital (Veterinary Clinical Complex) with state of the art clinical and surgical facilities is created at Rajendranagar campus for providing advanced and specialized treatment to livestock and pets. Besides, all Veterinary Colleges are also providing specialist veterinary clinical services in their local area.

Livestock Research Stations are focussing on genetic improvement of Sahiwal cattle, Murrah buffaloes, Deccani and Nellore Sheep. As part of these programmes, superior breeding bulls and rams are being supplied to farmers for improving the performance of farmers' flocks.

Projects of Repute

Under the ICAR-All India Network Project (AINWP) on Bluetongue, a **pentavalent inactivated vaccine** with five

Bluetongue Virus serotypes (BTV-1, 2, 10, 16, and 23) was developed and the technology was transferred to Indian Immunologicals Limited, Hyderabad. This vaccine is currently in use throughout India. Under the DBT-BBSRC funded project, new bluetongue serotypes that are prevalent and are not part of vaccine are identified and recommended for their inclusion in the vaccine. Since 24 of 29 serotypes of Bluetongue worldwide are in circulation in India, another DBT funded project was undertaken to develop a **sub unit vaccine effective against majority of BTV serotypes**. For this, conserved VP2 protein of BTV was expressed as recombinant protein and its efficiency as a broad spectrum vaccine was tested in mice and sheep models. The results are very promising and are published in reputed journals. Efforts for large scale protein production in a cost effective way are in progress.

Canine gastroenteritis is a serious concern among dogs despite routine vaccinations. To address this issue, a DBT funded project was undertaken. It was found that majority of the viruses in circulation were varying from the commercial vaccine strains. In addition, several new viruses (canine astro virus, canine corona virus, canine bufa virus) were also detected and **for the first time in India, whole genome sequences of wild type canine corona virus, canine astro virus, canine distemper virus, canine bufavirus were deposited in Genebank.**

In the **Indo-French ECLIPSE** research project, it was found that L-homoarginine can initiate the recruitment of primordial follicles and their development into primary follicles. These results would be beneficial for cattle suffering from heat and transition stress.

"For the first time in India, whole genome sequences of wild type canine corona virus, canine astro virus, canine distemper virus, canine bufavirus were deposited in Genebank".

Keeping Fisheries Afloat

Keeping in view the impetus given to fisheries sector by the Government of Telangana, Surveillance of fresh water fish diseases in the state is being undertaken by the Fisheries Research Station (FRS), Palair under National Surveillance Programme on Aquatic Animal Diseases (NSPAAD) and Prime Minister's Matsya Sampada Yojana (PMMSY) with financial support of Rs. 50.00 lakhs from National Fisheries Development Board (NFDB) and Ministry of Animal Husbandry, Dairying and Fisheries (DADF), Govt. of India.

A total of 2,222 fishermen/fisherwomen and Aquapreneurs were trained at FRS during the last five years under various programmes funded by different agencies with an outlay of Rs. 78.32 lakhs.

Reaching out to Farmers

Krishi Vigyan Kendra at Mamnoor, totally funded by ICAR is the only institution under the University which is working on the extension of latest technologies to farmers. It is creating awareness on modern farm practices through field demonstrations and trainings.

Training of MAITRIs (Multipurpose Artificial Insemination Training in Rural India) is being undertaken with the help of SERP. These functionaries will be of immense help in delivering basic animal health services (first aid) including artificial insemination of cows at farmers door step and will also empower rural women.

Horticulture and Sericulture

The Growth Engines of Telangana

What is the level of contribution of horticulture in the state of Telangana? Which are the most important Horticulture crops of the State?

Horticulture is the main growth engine contributing substantially to the economy of Telangana State. Though the area under Horticulture is 5.39% of total Agriculture area, the sector contributes 26% in terms of value of the produce (Agriculture crops values Rs.89,058 Cr, Horticulture crops Rs.22,274 Cr). Horticulture covers an area of 11.57 lakh Acres with an annual production of 59.03 lakh MTs.

The area under Horticulture sector has growth from 20.31% (from 9.62 lakh acres in 2014-15 to 11.57 lakh acres in 2020-21)

S. No	Sector	Area (lakh Acres)
1	Fruits	4.24
2	Vegetables	2.22
3	Spices	3.57
4	Plantation	0.55
5	Flowers	0.08
6	Medicinal & aromatic	0.0069
7	Agroforesty	0.9
Total		11.57

Source: RSSS 2020-21

SHRI VENKATRAM REDDY
Commissioner Horticulture & Sericulture, Telangana State

Main Fruit crops grown in Telangana State are Mango (3.06 lakh acres), Sweet Orange (0.55 lakh acres), Acid Lime (0.21 lakh acres) and the main Vegetable crops are Tomato (0.64 lakh acres) Brinjal (0.13 lakh acres), Bhindi (0.13 lakh acres), Gourds (0.24 lakh acres), Green chilli (0.25 lakh acres) and leafy vegetables (0.19 lakh acres). The main spice crops are Red chilli (2.40 lakh acres), Turmeric (1.03 lakh acres). Oil palm (0.4 lakh acres) is grown as major plantation crop.

Which are the important schemes implemented by the government to promote Horticulture in the State?

The Government of Telangana after formation of the State launched several flagship programmes for the promotion of Horticulture in the State.

Micro Irrigation

Considering the importance of water and power savings and to maximize the yields in Horticulture crops, the Govt. of Telangana attached utmost importance to Micro Irrigation and implemented the programme with unique subsidy pattern of 100% to SC & ST Farmers, 90% to BC and Small &Marginal Farmers and 80% to all other Farmers with a maximum ceiling limit of 12.5 Acres (5 Ha) per each farmer with the maximum subsidy limit of Rs.7.21 lakhs per Farmer. After formation of the Telangana State, within a span of 8 years, an area of 8 lakhs acres was covered for 3 lakhs beneficiaries with an Financial outlay of Rs.2048.84 Crores.

Vegetable cultivation on Pandals

The Govt. has given priority for construction of permanent pandals to cultivate all vine vegetable crops on pandals by providing a subsidy of Rs.1.00 lakh per Acre. After formation of the state, 5500 Acres has been brought under pandal cultivation.

Establishment of Centres of Excellence

The State Govt. with an intention to impart trainings to farmers and establishing Demonstration plots with latest technologies took steps for establishing Centres of Excellence, one for Vegetables and Flowers at Jeedimetla Village in Medchal District in an area of 10 acres and another for Fruits at Mulugu in Siddipet District in an area of 50 Acres. These centres demonstrate all the latest technologies, crops and varieties suitable for Telangana climate and are serving the purpose of imparting training. Scientists, VIPs and other reputed persons across the country have visited these centers and have appreciated the efforts of the Government of Telangana. Both the centres have imparted trainings for 25000 Farmers.

These centres are also producing superior quality vegetable pluglings through Hitech vegetable nursery which are being supplied to the farmers on subsidy. Till date 4 crore seedlings have been distributed to the Farmers on subsidy through these centres.

Oil palm Area Expansion

Till the formation of Telangana State, the cultivation of Oil palm was restricted to erstwhile Khammam District (present Khammam & Bhadadri Kothagudem) and part of Nalgonda (Nalgonda & Suryapet) in an area of 40,000 acres. The Govt. of Telangana keeping in view of the edible oil requirements of the country decided to promote Oilpalm cultivation on a massive scale. It is proposed to cover 20 lakh acres in the next 3 years with Oil palm duly notifying 26 Districts in the State and taking all the steps required for implementation of the programme. The Government has further allocated Rs.1000 Cr budget for Oilpalm area expansion during 2022-23 duly integrating with Micro Irrigation.

Urban Farming

Realizing the importance of growing vegetables in the backyards and terraces, Department has formulated Urban farming scheme in 2013, particularly for Hyderabad city with an objective to make city dwellers grow their own vegetables and to reduce burden on the local vegetable markets. Under this scheme, a kit is being provided to the beneficiaries which consists of Grow-bags (Silpaulin covers), potting mixture, Vegetable seed kits containing 12 varieties of vegetable seeds, Neem Cake, Neem Oil and implements like, Kurphi, Secateurs, small sprayers, shower, poly feed and cloth bag are provided on 50% subsidy basis.

The department is organizing training programme to extend the support to the interested households of twin cities of Hyderabad and Secunderabad on growing of vegetables in terraces and balconies every month of Second Saturday and fourth Sunday at Telangana Horticulture Training Institute, Nampally, Hyderabad. In the last seven years, an area of 1,60,500 sq.MTs (401.25 Acres) terrace area was brought under the cultivation of vegetables in the twin cities and 32,100 families are benefitted by this innovative scheme.

How is Telangana Government promoting hi-tech cultivation among the Farmers?

The Government of Telangana is promoting Hitech cultivation of exotic flowers and vegetables among the Farmers with an intention to promote offseason cultivation and better remunerative prices to the farmers of the State as well as to ensure

continuous supply of vegetables and flowers throughout the year.

On 2nd June 2014, the Hon'ble Chief Minister announced a flagship programme of establishment of Poly houses and Green houses with unique subsidy pattern of 95% to SCs & STs and 75% to other Farmers with a maximum ceiling of 3 Acres per Farmer. Due to the proactive attitude of the Government an area of 1324.47 acres is covered under Poly houses for 1190 Farmers with an outlay of Rs.320 Cr

How is Telangana Government encouraging value addition in Horticultural products? Are there any technology partners?

Before formation of Telangana State, the Farmers grew varieties of their own choice, particularly in Fruits & Spices which have limited scope for value addition. But after formation of the State, the Govt. has focused and promoted varieties which are suitable for exports, processing and value addition. In Mango, varieties like Dasheri, Kesar, Himayat having export potential are being promoted. Likewise, Brazilian oranges, Katol Gold and New cellar cultivation is promoted under Citrus spices and high curcumin varieties under Turmeric are also being promoted with an objective to promote processing and value addition in Horticulture crops.

What are the Highlights of the crop colony programme? How will it help the Farmers in marketing their produce and fetch better prices?

The Government of Telangana is implementing crop colony concept with an objective to identify compact patches suitable for crop cultivation particularly for vegetables. In compliance with the policy of the Government, the Department of Horticulture implemented pilot crop colony project for vegetables in Rangareddy District during 2017. 2780 farmers have been identified in an area of 3562 Acres in 38 villages of 3 Mandals (Ibrahimpatnam, Manchal and Yacharam) for providing hybrid vegetable pluglings / seeds, Micro Irrigation, Pandals and provision of plastic crates with an outlay of Rs.5.00 Crores. Due to the implementation of the Pilot crop colony of vegetables, the yield of the area has been increased from 44,000 MTs to 83,000 MTs. Due to this the Farmers have inculcated the habit of collective marketing and got remunerative prices.

Which are the new Horticulture crops that have been introduced and well received by the Farmers?

After formation of the Telangana State, the Govt. has taken several steps to introduce many Horticulture crops and varieties suitable for Telangana climate and soils.

An area of 1295.35 acres is covered under Apple Ber crop. An area of 512.025 acres is covered under Custard Apple NMK-1 variety. Dragon fruit occupies an area of 233.05 acres whereas Fig variety Diana, Turkey Brown covers an area of 255.85 acres. 2373.45 acres is covered under Thai Guava.

What is the significance of sericulture in Telangana?

Telangana produces 399.78`0 MTs of silk. The state ranks sixth in the country. Due to the favorable climate and suitable soils for Sericulture sector, there is a large scope for expansion of mulberry in 50,000 acres with the state with the state and central government support.

Which are the important Government programmes implemented in Telangana to improve the Sericulture sector of the State?

Central Sector Scheme, RKVY, MGNREGS and Normal State plan are the ongoing schemes.

Why was it decided to merge MGNREGS with Tasar Rearing?

This was mainly to help the poor tribal farmers with help of MGNREGs programmes and for providing annual income of 145 man days on an average BY RD Dept. @Rs. 211/- per person day and By Line Department i.e. cost of 600 dfls @Rs. 3200/- per beneficiary for benefit to poor tasar tribals farmers

What are the main challenges of the Sericulture sector of the State?

Insufficient technical man power due to regular retirement of staff in the department and no fresh recruitment into the department for the past 20 years is one of the major challenges. Sanction of the funds under annual normal state plan and labour shortage are other challenges.

How is the silk produced in the State marketed?

About 10,000 weavers are working on handlooms and total silk utilized in the State through the Silk weavers of Pochampally, Gadwal, Narayanpet, Chowtuppal & Jangaon areas.

Are there any capacity building programmes conducted by the Government authorities for the benefit of the farmers?

Yes, training programmes are conducted within the Department and RSRS, Mulugu, Central Silk board and Govt. nodal agency of ATMA by audio visual equipment. Doordarshan programmes are also attended to motivating Sericulture farmers

PUTTING FARMER FIRST-TS MARKETING

Farmer is considered as the backbone of the country and yet he is rewarded the least in the entire value chain of an agricultural commodity. Regardless of the crop produced, a farmer's income depends on the ability to sell his produce at remunerative prices. In this context, Telangana Agriculture Marketing department has been enabling farmers in enhancing their income through appropriate interventions in the fast evolving and highly volatile ecosystem of Agri commodity marketing space. The main objective of the marketing department is to facilitate trade by providing necessary infrastructure and to disseminate trade information for better price realization.

Robust Market Infrastructure

In order to take the aforesaid objective forward, the state government has invested heavily in improving market infrastructure since the formation of Telangana state in 2014. Currently,192 AMCs are functioning in the state to provide better outreach for marketing of agricultural produce in rural area.

Telangana Agricultural Marketing Department constructed 457 new scientific godowns at 364 locations with capacity of 17.35 Lakh MTs with total amounting to 1167 godowns and 24.73 Lakh MT (Old and New Godowns) capacity. To strengthen the functioning of these markets, e-NAM was implemented in 57 AMCs in the state and implementation of e-NAM facility is under way in the remaining AMCs. In 2017, the AMC of Nizamabad was awarded the Prime Minister's Excellence Award for showcasing best performance in implementation of e-NAM. The state was also the first in the country to implement weighment integration and payments under e-NAM and traded 45.62 Lakh MTs of agriculture produce benefitting 18.24 Lakh farmers who received e-payments valued at Rs. 6.39 crores through e-NAM as on 28.02.2022. The State has received the Prime Minister's Award for Excellency for the second time for AMC Kesamudram in e-NAM implementation.

To enable easy access to various agriculture & allied produce like vegetables, fruits, flowers, poultry & meat products to consumers in the state, the department established 6 Integrated markets at Gajwel, Siddipet, Suryapet, Tooparan, Gadwal and Wanaparthy. The department established 3 special commodity markets for Mosambi, Lemon and Donda commodities in Nalgonda district to provide market access to famers for selling their produce at competitive rate.

To enable access to better market infrastructure facilities to women farmers and road side vendors for selling their produce along National highways, department constructed Rythu markets at Pragnapur under AMC Gajwel and Allapur at Toopran toll gate.

SMT G LAKSHMI BAI
Commissioner Marketing (FAC)

Bridging the gap between Farmer and Consumer

Efforts of Marketing Department are evident in bridging the gap between Farmer and the consumer through " Rythu Bazars" and "Mana Kuragayalu" project. The objective was to provide Direct Marketing facility to the farmers and providing Quality vegetables at affordable prices to the consumers.

Under these interventions, Marketing department has established 47 Rythu Bazars across the state to provide direct interface between farmers and consumers thus ensuring availability of vegetables at convenient locations. Around 3,885 farmers per Rythu Bazar with daily sale of 793 MT are operating across all the Rythu Bazars.

In "Mana Kuragayalu " project , 39 retail outlets were established and 5754 MTs of vegetables were procured from 1,715 farmers thus generating value of Rs. 8.33 crores. These interventions has created a win-win situation for the farmer & consumer.

During COVID-19, the Department had played a key role in facilitating F&V sales to consumers by initiating Mobile Rythu Bazars in selected areas, colonies, and apartments, thus avoiding any potential losses to the farmers.

Integrating Technology

As part of reducing carbon foot print, Department has constructed Biogas plant jointly funded by Department of Biotechnology, GOI and by Department of Agricultural Marketing, Govt. of Telangana with CSIR-Indian Institute of Chemical Technology (IICT) as technology provider at Bowenpally market yard, Erragadda Rythu Bazar, Bata Singaram etc. At Bowenpally, the plant has a capacity to convert 10 tonnes of garbage into gas and power generation. Construction of another Biogas plant is under progress at AMC Gudimalkapur.

To bring transparency & increase the efficiency in the transactions, in the department enabling better access to marketing services to farmers in the state, the department has developed and launched E-services since 2018 to deliver market services such as E-licenses to traders & commission agents and E-Receipts at AMCs offices & check posts to bring transparency in operation of AMCs.

First step towards embracing IT enablement in marketing, department has developed and launched software for MSP procurement operations of cotton at notified cotton ginning mills in the state thus ensuring online direct payments to cotton farmers within 72 hours of generating cotton sale bill. Department has also issued 30 lakh ID cards to cotton farmers for the MSP operations besides providing computers, printers, web-cams, fingerprint scanners, internet connectivity, weigh bridges integration, cotton moisture meters at ginning mills.

TS agri marketing takes pride in establishing the First "Market Intelligence Unit" in the country in June 2021 by partnering with EY consulting firm. Key objective of Market Intelligence unit is to improve income of the farmers through better price realization of agricultural commodities by promoting cultivation & effective market planning of the market-oriented crops in the state. Remunerative crops were suggested to the farmers across the state during last Rabi season and market linkage activity is also being taken up for the crops produced in the state.

Going forward, Telangana Agri marketing department would continue to strive towards enhancing farmer's income by suitable interventions right from farm to fork. We understand that there is a lot of scope for the farmers' share to go up in the consumer rupee and hence, the effort and perseverance would continue to persist in "Putting Farmer First".

As part of micro credit financing, the Telangana Government has enhanced the ceiling loan Amount from Rs. 1,00,000/- to Rs. 2,00,000/- under **Rythu Bandu Pathakam (Pledge loan scheme)** and allowed interest free loans up to 180 days. As of January 2021, **10,267 farmers** are benefitted under the scheme and **127.43 crores** has been disbursed to the beneficiaries. This scheme could successfully prevent farmers from distress sales by improving holding capacity of the farmers.

During 2020-21, the department opened 307 cotton procurement centres in the state and 18 lakh MTs of cotton were purchased, amounting to Rs. 10,167 crore. Department also procured 132.93 Lakh MT in 2020-21 of paddy which accounts for 54% of the paddy produced in the state.

ICAR-CRIDA

Pushing Telangana towards Sustainability

ICAR-Central Research Institute for Dryland Agriculture (ICAR-CRIDA), Hyderabad a National Research Institute under Natural Resource Division of ICAR Institute was established in 1985 with a mandate to carry out basic and applied research that will contribute to the development of strategies for sustainable farming systems in the rainfed areas. A multi-disciplinary institute with a strength of 66 scientists and 61 technical personnel working in the various fields ranging from water management to sustainable rural livelihoods has been addressing challenges posed by increasing climatic variability. CRIDA has well-established facilities with modern infrastructure in the laboratories for carrying out advance research in the disciplines of soil science, agronomy, GIS, plant physiology, agroforestry, biotechnology, entomology, pathology, horticulture and animal science. It has two well developed research farms of 280 ha and 80 ha area each at Hayatnagar and Gunegal, respectively, nearby Hyderabad. These research farms have excellent facilities for demonstration of water harvesting and utilization systems, livelihood demonstration units, farm implements centre besides housing a modern bio-resource centre and a KVK. The Institute also undertakes National/ International collaborations and consultancy projects.

ICAR CRIDA with a strength of 66 scientists and 61 technical personnel working in the various fields ranging from water management to sustainable rural livelihoods have been addressing challenges posed by increasing climatic variability

CRIDA has played pioneering role in developing and disseminating improved rainfed farming technologies in different agro-ecological regions of the country. Over the last 35 years CRIDA and its network of research stations have developed and disseminated large number of technologies in rainwater management, watershed development, soil health management, cropping systems, farm machinery and diversified land use systems.

DR. VINOD KUMAR SINGH
Director, ICAR-Central Research Institute or Dryland Agriculture, Hyderabad

Near real time implementation of contingency plans is a daunting but important task to be achieved in the coming years through central and state government action plans. All India Coordinated Research Programmes (AICRPs) of ICAR on Dryland Agriculture and Agro-meteorology with 31 & 25 centers respectively each are in CRIDA and are involved in implementing various planned activities. Institute is also National Nodal point for the National Innovations in Climate Resilient Agriculture (NICRA) which is being implemented in large number of Research Institutes of ICAR, State Agricultural Universities and 151KVKs, evolving adaptation and mitigation strategies in agriculture and allied sectors and also taking up their demonstration in villages representing key climate vulnerabilities. Efforts

The Major Achievements of KVK, Ranga Reddy District

- Demonstrated Technologies and conducted capacity building programmes in 125 villages covering 29 mandals
- About 215 on Farm Trials were conducted and 312 Front Line Demonstrations
- A mini watershed with farm pond and having solar powered micro-irrigation system along with various soil and water conservation measures and cropping systems have been developed in KVK farm for the benefit of visiting farmers
- Demo units on enterprises like integrated urban farming, poultry, sheep rearing, fodder block, fruit crops plantations, vermicompost etc., are being maintained to
- A total of 5680 soil and water samples were collected and analyzed for the past five years covering 5300 farmers and soil health cards distributed
- Conducted kisan melas, field days, soil health days, womens day, poshan vatika, tree plantations, kisan diwas, animal health camps etc., catering to the needs of about 2.85 lakh farmers
- A number of publications like bulletins, brochures, research and popular articles have been brought out
- More than 500 q of certified seed of red gram, horse gram and green gram was produced and supplied
- Bio fertilizers viz., Azatobactor, Azospirillum, Rhizobium, PSB and bio-fungicides/bio-pesticides viz., Trichoderma, Pseudomonas, Beauveria, Verticillum were produced in Bio resource laboratory of KVK and supplied to 18250 farmers. A total of 24390 kgs of bio-products were sold to farmers raising an income of Rs.125673/- during the past five years.
- A total of 5321 capacity building programmes were conducted benefiting 265892 farmers Nearly 842 print media coverage was done based on field problems for large scale transfer of technology
- Empowered 1082 women farmers through promotion of backyard poultry with high productive synthetic breeds like Giriraja, Vanaraja, Ragasree etc.
- Skill training programmes sponsored by Ministry of Skill Development and Entrepreneurship, Government of India under RKVY on Floriculture- open field cultivation, Nursery worker, Animal Health worker, Diary management and Micro irrigation technician were conducted

are being made for scaling up these technologies through the National Mission for Sustainable Agriculture (NMSA). Since inception CRIDA has made significant strides in research and technology development for rainfed agriculture and climate change in order to take the country further in a sustainable manner.

Over a period of 50 years, the project contributed in rainfed agriculture development through policy and implementation of various National program/schemes which impacted in achieving stability in productivity and profitability in rainfed areas.

National Innovations in Climate Resilient Agriculture (NICRA)

To meet the challenges of sustaining domestic food production in the face of changing climate and to generate information on adaptation and mitigation in agriculture to contribute to global fora like United Nations Framework Convention on Climate Change (UNFCCC), the ICAR, Ministry of Agriculture and Farmers Welfare, Government of India launched a flagship network project 'National Innovations in Climate Resilient Agriculture' (NICRA) during 2011. NICRA is the unique project which brings all sectors of

CRIDA has played pioneering role in developing and disseminating improved rainfed farming technologies in different agro-ecological regions of the country

agriculture and extension scientists on one platform. The project has the objectives to undertake strategic and applied research on climate change adaptation and mitigation and to validate, demonstrate and assess the impact of climate resilient technologies on farmers' fields. It also envisages to strengthen the capacity of scientists, farmers and other stakeholders on climate resilient agriculture.

Technology Demonstration Component (TDC) of NICRA

It is a participatory programme involving demonstration of location-specific technologies on farmers' fields for coping with climate variability, to generate awareness and build capacity of farmers and other stakeholders on climate resilient agriculture and to support the established institutions at the village to enable communities to respond to climate stresses in a continuous manner.

Khammam and Nalgonda districts of Telangana were selected under TDC of NICRA since from 2011 and these two selected districts frequently encounter drought and dry spells. In Nacharam and Nandyalavari Gudem cluster of villages in these districts, demonstration of the promising climate resilient technologies under Natural resource management: Construction of farm pond, desilting of community water harvesting structure and in-situ water management; Cropping systems: Drought tolerant and resilient intercropping system and Livestock: Improved fodder varieties, improved backyard poultry, mineral mixture were carried out. The water management practices taken in the cluster of villages helped in the yield improvement in kharif crops by 14 to 28% over the farmers' practice. Improved crop varieties of paddy (WGL-44), green gram (MGG-42), pigeon pea (WRG-65, PRG-158/176 and LRG-52), black gram (PU-31 and TBG-104) and groundnut (ICGV-00350) helped to increase crop yields by 14 to 21 % over the local varieties. Feeding on improved fodder cultivars: CoFS-29 & 31, CO-3 & 4, Tanzania, King grass, super Napier, MP-chari, APBN-1 and mineral mixture to dairy animals helped to increase milk yield by 1 to 2 liters per day per animal compared to farmers' practice. Demonstration of improved backyard poultry (Rajasri) helped to income diversification for small farmers.

Krishi Vigyan Kendra (KVK), Ranga Reddy District

Krishi Vigyan Kendra, located at the Hayatnagar research farm of CRIDA for Ranga Reddy District was established in 1976 as an innovative institution attached to AICRPDA to organize need based and skill-oriented trainings on the basis of work experiences for the practicing farmers, farm women by the principles of "learning by doing and Teaching by doing".

The problems faced by the farmers

are alike in almost in all areas of the Ranga Reddy district. However, their degree of intensity varies from area to area depending upon the availability of resources and crops/enterprises that are being pursued by the farmers. The KVK identifies suitable technologies and also imparts necessary skills to the farmers for efficient utilization of technologies in solving various problems faced by them. Depending on the information gathered through PRA surveys, farmers group discussions and consultations with the subject matter experts and extension specialists, various thrust areas for the district were identified and addressed by organizing trainings, demonstrations, diagnostic visits and field days

Farmer First Project

A frontline extension programme of ICAR was initiated by ICAR-CRIDA in December, 2016 entitled "Farmer centric natural resource development for socio-economic empowerment in rainfed areas of Southern Telangana Region" for enhancing knowledge & integrating technology with farmer farm, innovations, resources & science and technology by farmer-scientist interface, participatory technology assemblage, application, feedback, partnership, content mobilization and institution building covering 400 farmers in five villages of Pudur Mandal (namely Gangupally, Rakamcharla, Devanoniguda, Medikonda and Pudugurthy), Vikarabad, Telangana. The major aim of the project is technology assemblage, application and feedback which focusses on the development of existing farming systems where effective soil and water conservation modules, improved crop varieties, new horticultural techniques, livestock-based technologies, have been integrated into local systems majorly to increase productivity and income of farmers.

Under soil and water conservation, the important interventions were four plastic film embedded gabion check dams to store rainwater (water table enhanced by 0.6m), conservation furrow for in situ moisture conservation (25% higher yield of pigeonpea), micro-irrigation (drip systems) and fertigation system for vegetable crops, drip system, plastic mulching and portable raingun system for field crops.

Cropping systems and small farm mechanization module included soil health card to 600 farmers, improved varieties of red gram, some vegetables in kharif, chickpea and vegetables in rabi, paddy nursery preparation, floriculture and mango plantations apart from promoting inter-cultural operations, intercropping and crop rotation. Seven types of need-based implements have been identified, procured and demonstrated.

Livestock based intervention included promotion of backyard poultry Srinidhi, Vanraja and Grampriya, promotion of indigenous sheep breeds, Nellore and Deccani, improved fodder production and management, salt lick to goats (reduced kid mortality), mineral mixture to ruminants (improved milk yield by 23%).

Under institutional and capacity building, more than 15 farmer-scientist interactions were organized apart from organizing field days, international women day, world soil day, etc. A farmer society was created at Gangupally village apart from common interest group formation in Medikonda village.

Mera Gaon Mera Gaurav (MGMG)

Mera Gaon Mera Gaurav programme launched by Honourable Prime Minister Sri Narendra Modi during the 87th Foundation day of ICAR at Bihar on 25th July, 2015 is implemented in selected villages of Telangana with the objective to provide farmers with required information, knowledge and advisories on regular basis by adopting villages and work in convergence with state govt departments.

Besides above, events like World Soil Day, Jai Kisan Jai Vigyan week, distribution of seed of improved varieties to farmers, Group discussion of farmers, Awareness camps and Field days are regularly planned in the adopted villages

Scheduled Castes Sub Programme (SCSP)

In Telangana State, Kotapally Mandal of Mancherial district (erstwhile Adilabad) has been selected by NITI Aayog for implementation of SC Sub Plan. In this context, ICAR-CRIDA has developed an action plan. The action plan has been initiated from the last quarter of 2018-19 and is being continued during the current financial year. Three villages have been selected having more than 40% of SC population viz., Mallampet, Nagampet and Edagatta for implementing the action plan.

AUGMENTING TELANGANA'S FISHERIES WEALTH

Telangana Government aims at increasing fish production and productivity by providing backward and forward linkages, enhancing livelihoods of fishers, achieving self-sufficiency in production of fish seed, ensuring availability of fish to the consumers at an affordable price and in hygienic condition by improving the marketing infrastructure, and implementing welfare programs.

The state has vast and diverse resources in the form of tanks/ponds (both seasonal and perennial), reservoirs, rivers and canals. In addition to these irrigation sources, the area covered under Aquaculture ponds is 2,455 ha. There are 4,818 Km. long canals and rivers.

Training

Skill development programmes are being taken up with the funding support under Integrated Fisheries Development Scheme (IFDS) and with funding support from National Fisheries Development Board (NFDB).

Welfare Schemes for fishermen

All the Fishers registered with Department are covered under the scheme Group Accident Insurance Scheme. The said scheme has been incorporated in PMMSY from 2021-22, GOI has appointed the National Fisheries Development Board (NFDB) as Nodal Agency for implementation of Scheme.

Group Janata Personal Accident policy(GJPA) covering Death and Permanent Total Disability(PTD) with (Capital Sum Insured) CSI of Rs.5 Lakhs, the premium amount is Rs.72.44/- paid by Central Govt. and State Government on 60:40 basis for 3.36 lakhs fisheries in the state.

Special Contingency policy Covering Permanent Partial Disability (PPD) and Hospitalization. PPD: Upto Rs.2,50,000/- Hospitalization:Rs.25,000/-

The State with many Firsts

Telangana is the first state in the country to stock fish seed on 100% grant in all open water bodies. Telangana is also the first state in the country to stock hatchery produced scampi juveniles with 100% grant subsidy in selected open water bodies. The state ranks first for having highest water spread area of tanks & Reservoirs at 7,75,589 ha. which are under culture.

Sri Lachiram Bhukya, IRS,
Commissioner, Fisheries

Telangana ranks first in the country with 4634 Fishermen Coop. Societies and with 3,36,799 active inland fishermen insured. Telangana was also the first to bring all MI tanks under the control of Dept. of Fisheries for disposal of fishery wealth. It was also the first state in the country to take a mega project of supplying 150 Mobile Fish Retail Outlets, exclusively to women groups to empower women from back ward community.

Telangana also for the first time took up Aquahub with 600 cages under an integrated project with an outlay of Rs.1000 crores. The project will be implemented by M/s Fishin India in Mid Manair Dam, Rajann Sircilla district , Telangana.

Geo-tagging of water bodies:

NRSC Hyderabad has been assigned with Geo tagging of water bodies. So far 22,757 water bodies have been geo tagged . Telangana Fisheries is the first in the country that geo tagged all the water bodies. This has helped in bringing more water bodies under Free Seed Stocking Programme. It will help in more production, formation of more number of Fisheries Co-operative societies

Details of Fish Exports through Hyderabad Airport, Country-wise

Sl No	Country Name	2019-20			2020-21		
		Qty Tons	Value Rs.Lakh	U S Dollar (Mln)	Qty Tons	Value Rs.Lakh	U S Dollar (Mln)
1	CAMEROON	0	0.00	0.00	3	15.11	0.02
2	DJIBOUTI	0	0.00	0.00	3	10.84	0.02
3	USA	1	4.03	0.01	56	305.88	0.43
4	CHINA	2	13.11	0.02	1	4.86	0.01
5	TAIWAN	0	0.00	0.00	5	32.40	0.04
6	HONG KONG	2	19.59	0.03	0	0.00	0.00
7	SOUTH KOREA	0	0.00	0.00	0	0.00	0.00
8	SINGAPORE	1	9.25	0.02	0	0.00	0.00
9	THAILAND	74	53.68	0.08	9	4.53	0.01
10	JAPAN	23	95.43	0.14	0	0.00	0.00
11	VIETNAM	0	0.00	0.00	0	0.00	0.00
12	BAHRAIN ISLAND	0	0.00	0.00	5	25.13	0.03
13	QATAR/DOHA	230	643.20	0.92	352	1154.08	1.56
14	SAUDI ARABIA	0	0.00	0.00	0	0.00	0.00
15	U A E	877	2361.47	3.40	551	2725.99	3.72
16	OMAN/ MUSCAT	2	2.38	0.00	2	11.17	0.02
17	KUWAIT	207	607.39	0.86	216	780.40	1.07
18	BELGIUM	6	25.92	0.04	0	0.00	0.00
	Total	**1424**	**3835.45**	**5.50**	**1204**	**5070.40**	**6.93**

Flagship programme- Supply of fish seed and prawn juveniles on 100% subsidy

S. No	Year	Fish seed (crore nos)			FW Prawn juveniles (crore nos)		
		Water bodies	Quantity (crore nos)	Expenditure (Rs.Crores)	Water bodies	Quantity (crore nos)	Expenditure (Rs.Crores)
1	2017-18	11,067	51.08	44.60	11	1.08	1.38
2	2018-19	10,776	49.15	42.95	24	3.19	6.27
3	2019-20	15,715	64.08	46.63	70	3.42	6.39
4	2020-21	18,335	68.52	52.01	93	4.01	8.61
5	2021-22	23,263	77.49	76.75	275	8.02	20.85

Units supplied to beneficiaries:	
Vending units with Mopeds..	58,137
Vending units with auto..	2,954
Mobile Fish Outlet units..	841
Fish Transport vehicles ..	111
Portable fish vending kiosk..	1,351
Crafts and Nets ..	14,898
Revolving fund to women .	151 Women societies

AWARDS

Dept. of Fisheries-Telangana State was awarded Agri-food Empowerment award for the Year 2021.

Received cash award of Rs.10.00 lakhs for Best Performing Inland state Sector from Govt. of India, New Delhi on 21st Nov, 2021

Murrel –"State Fish" of Telangana state

Govt. of Telangana has declared Murrel as "State Fish" and has requested GOI to set up National Centre for Murrel Culture under aegis of ICAR at FSF, Wyra, Khammam district. MoU with Central Institute of Freshwater Aquaculture in Promotion of Seed Production and striped Murrel (Channa striatus) with CIFA, Bhubaneshwar has been signed.

Special Drive on Fisheries Co-operative Societies Organization:

A special drive was launched by Sri Talasani Srinivas Yadav, Hon'ble Minister for AH, Dairy Development, Fisheries and Cinematography on 4.4.2022, where all eligible fishermen will get benefitted as member of Coop. Society, every water body will come under the area of operation of Coop. society, Fish production can be increased and better monitored and livelihoods for fishermen would be enhanced.

STRIVING FOR THE UPLIFTMENT OF FARMERS OF TELANGANA

Sri Konda Laxman Telangana State Horticultural University (SKLTSHU) came into existence in 2014. The University runs on the mandate of Education, Research and Extension of horticultural domain.

The Knowledge Providers

SKLTHSU offers B.Sc. (Hons.) (Horticulture),M.Sc. (Horticulture) and Ph.D. (Horticulture) degrees. A total of 38 JRF and 7 SRF were secured by the students of SKLTSHU. Smart class rooms, innovation rooms and start up incubators are part of this university infrastructure. Online classes for coaching of IAS are also being conducted.

A total of 38 students of SKLTSHU were selected for the post of Assistant Professor in various disciplines and 32 students as Horticulture Officers. The Instructional farm of the university spread over an area of 50 acres has been initiated at College of Horticulture, Mojerla. The university secured 33rd rank out of 67 Horticultural and Agricultural Universities in India.

The first convocation was held on 7th April 2021, where a total of 529 students were awarded UG, PG and Ph.D degrees. A total of 12 gold medals were given to meritorious student in the presence of chief guest Dr. Trilochan Mohapatra, Secretary DARE and DG ICAR and Her excellency Tamilisai Soundararajan (Hon'ble Governor of Telangana & Lt. Governor of Puducherry and Chancellor of the University, Board of Management, Academic) Council Members and Students and Parents in Virtual Mode.

DR B NEERAJA PRABHAKAR
Vice Chancellor,
Sri Konda Laxman Telangana
State Horticultural University

Robust Research

The horticultural university, although new, the research component is very strong among its constituent horticultural research stations. All India Coordinated Research projects (AICRP) are also operating at different research stations of the university. The university has 11 research stations.

SKLTSHU is maintaining evaluated 477 accessions of mango, 10 accessions of custard apple, 28 accessions of guava and sapota each. They are also maintaining germplasm of vegetables (177) for Research on crop improvement. Released varieties like Brinjal (Bhagyamathi, shymala and Gulabi) Snake gourd (Swetha), Dolichos Bean (RND-1), Ash Gourd (Shakti), Cooking Melon (RNSM-1, RSNM-3), Amaranthus (RNA-1), Sweet potato (Samrat, Kiran), Colocasia (Satamukhi), Elephant foot yam (Gajendra). Elephant foot yam Gajendra variety is very popular in Calcutta. The university is also maintaining germplasm of turmeric (290), flower (194) (Gladiolus, Tuberose, Chrysanthemum, China aster Marigold) and medicinal and aromatic crops (Aswagandha, Kalmeg, Phyllanthus, Glory lilly, Lemon grass, Davanam) and medicinal and aromatic crops (115) (Aswagandha, Kalmeg, ,Phyllanthus, Glory lilly, Lemon grass, Davanam). A total of 7 varieties were released during 2019, mango (Dashehari-34), guava (SRD4), colocasia (RNCA-1), coriander (RNCD-01), Yardlong bean (RNYB-01), cluster bean (RNCB-01), gladiolus (ACC-1).

ARI 516 (H 516/MACS 516) is the first grape variety released and notified through ICAR-AICRP at 28th meeting of CVRC for Horticultural crops. It is a promising juice variety for processing industry in Telangana region.

The University has dedicated research station for fruits such as Fruit Research Station, Sangareddy (mango, guava and seethaphal); Grape Research Station, Rajendranagar; Horticultural Research Station, Mallepalli, Nalgonda District (Citrus, Pomegranate And Palmarah); Horticultural Research Station, Aswaraopet, Khammam District (Banana, Papaya, Beetlevine) and JVR Horticultural Research Station, Malyal, Warangal District (Sapota, Amla, Fig, Karonda, Onion, Garlic and Chillies). There are also Vegetable Research Station, Rajendrangar (Tomato, Brinjal, Chilli, Bottle gourd, Ridge gourd, Cooking melon); Medicinal and Aromatic plants Research Station, Rajendranagar; Turmeric Research Station, Kammarapally and Horticultural Research Station, Adilabad (Jamun And Minor Fruits, Beans, Aromatic Plants - Lemon Grass, Citronella And Palma Rosa).

Recently, the government has piloted value addition to mango in the form of tying up the buyers to the mango FPO of Nagarkurnool, Mancherial, Jagityal and Mahaboobnagar. These kind of linkages are the first ones of their kind in a government system.

Proven Technologies

- Standardized fertigation technology for mango, IPNM in guava and package of practices in organic production of mango and guava
- Identified Sel No. 11 jamun accession with highest fruit weight and quality comparable with Konkan Bahadoli variety
- Evaluated performance of new crops like strawberry variety Nabila in Adilabad and found to be well adapted to the Northern Telangana conditions
- Standardized the fertigation schedules for cabbage, lettuce and broccoli under protected cultivation and chillies in open conditions
- Standardized IPM for Brinjal shoot and fruit borer and tomato pin worm
- Standardized the management of sucking pest, yellowing and viral diseases of bitter gourd,
- Evaluated Kufri Chipsona-3 which was found to be performing well under Northern Telangana conditions recording 25.6 t/ha
- Standardized the postharvest holding solutions for extending the shelf life of tuberose

- Standardized the organic cultivation of Aloe (Aloe barbadensis),
- Standardized stevia addition to replace sugar in preparation of processed products like squash
- Standardized the harvesting stages for herbage yield and oil in citronella, lemon grass and palma rosa,
- Introduced and popularized raised bed system of planting in turmeric, which enhances the yield and reduces the rhizome rot
- Introduced the cut pieces of two budded seed rhizomes for turmeric planting, which reduces seed quantity from 10 quintals to 6 quintals with seed treatment for 45 minutes (Metalaxyl and Quinolphos).

Excellent Extension Endeavours

The University has regularly popularized proven technologies and improved varieties through various extension activities namely, All India Radio, TV, print and visual media, participation in exhibitions, Krishi Melas etc. The university has one Krishi Vignana Kendra at RamagiriKhilla. Apart from this the university has supplied 4.5 lakh good, genuine, true to type planting materials

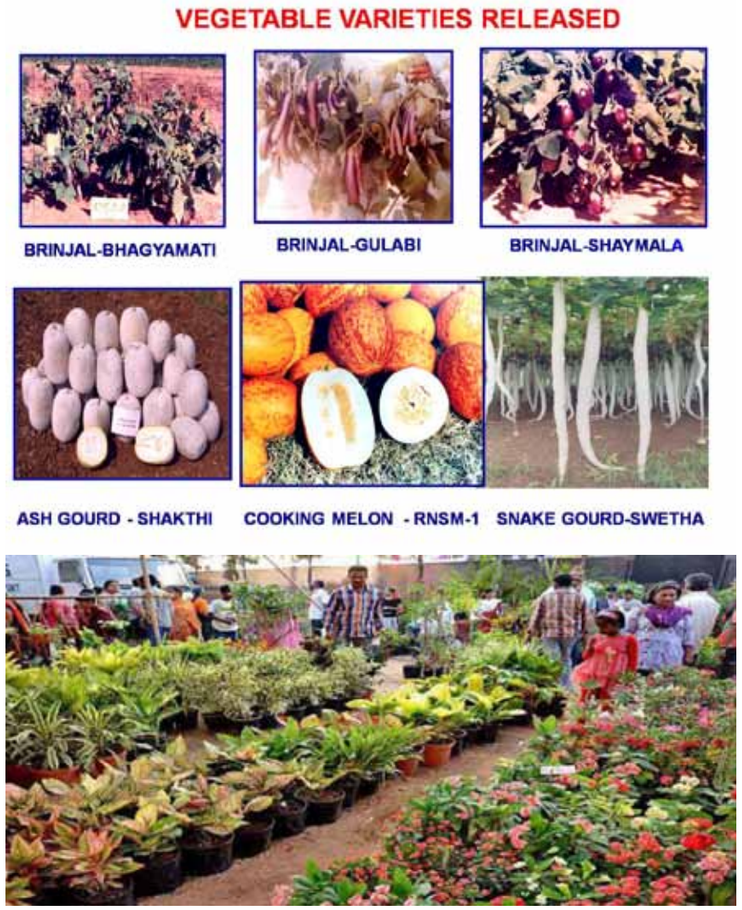
Horticulture in Telangana covers 16.5 % of net sown area and contributes 40.5 % to Agriculture GSDP. There is a huge potential for horticulture sector growth which remains untapped. The total area under horticulture is 12.40 lakh acres with an annual production of 71.52 lakh MTs. Major fruit crops in the state are mango, citrus, banana, guava and papaya while vegetables like tomato, brinjal, bhindi and various varieties of gourds are predominant. Chillies, turmeric and coriander are important spice crops. The area under fruits is 4.42 lakh acres with a production of 25.69 MTs and productivity of 5.82 MTs/acre. The area under vegetables is 3.52 lakh acres with a production of 30.77 lakh MTs and productivity of 8.73 MTs/acre. The spices are cultivated in 3.90 lakh acres with a production of 8.03 lakh MTs and productivity of 2.06 MT/acre.

SKLTSHU is the only university which has taken a pragmatic approach towards reaching the goal of nutritional security of the Primitive Tribal Group (PTG)

of mango, guava, sweet orange, acid lime, custard apple. Recently, KVK, Ramagirikilla received national award "Krishi Kharshak" from ICAR due to its commendable services in transfer of technology to the farming community.

Recently, the government has piloted value addition to mango in the form of tying up the buyers to the mango FPO of Nagarkurnool, Mancherial, Jagityal and Mahaboobnagar. A total of 2500 farmers and 3300 acres of mango in four districts were involved in this project which was implemented through SERP. This form of linkages is the first of its kind in government system. The project has linked the farmers through FPO directly to the buyers eliminating the middle men and uplifting the small and marginal mango farmers. Women farmers and FPO organisation were involved in this project.

Almost 300 BDOs were trained in the Good Agricultural Practices of harvesting of mango at Fruit Research Station,



Sangareddy. The scientist of SKLTSHU have given all the technological input to this project. The project has been successfully launched and is in progress. Buyers like Big basket, Ratnadeep, Yellow and greens, simply fresh were involved in making this project success. The average price of mango at farm gate so far in these districts was Rs 42 for grade A mango.

Centre of Excellence

In view of the success of such coordination, it was felt to streamline cooperation and collaboration among different government agencies especially in Horticulture. In this direction, the COE Mulugu which has planted 39 different varieties from 6 fruit plants; totalling 15895 plants under high density (3 X 2 m spacing) using weed mat mulching will be used from now onward as instructional farm for the newly established PG centre of SKLTSHU, at Mulugu. All the technical guidance in the training, pruning and fertigation will be given by the scientist of SKLTSHU. The COE, Mulugu will also be used as research farm for the PG research as well as non plan research work of SKLTSHU. Further, COE Jeedimetla with its polyhouses for cultivation of protected vegetables and flower will also be utilized as instruction farm and research farm for SKLTSHU hence forth.

The road map of the University is to establish new colleges at Adilabad, Malyal and Mulugu

Accolades

In the review meeting on "Nutritional Intervention in Primitive Tribal Groups" pilot program, the work done report on nutritional interventional program in six Primitive Tribal Group (PTG) villages @ two villages/hamlet each in Bhadradri-Kothagudem (Gogulapudi and Pusukunta-Konda Reddy) attached to HRS, Aswaraopet, Nagar Kurnool (Appapur and Bourapur-Chenchu) attached to COH, Mojerla and Adilabad (Burki and Mangli-Kolam) attached to HRS, Adilabad and HPT Polytechnic was presented.

Her Excellency Tamilisai Sundararajan, Governor of Telangana and Puducherry has appreciated the work done by the colleges and Research Stations of SKLTSHU and also commented that the SKLTSHU is the only university which has taken a pragmatic approach towards reaching the goal of nutritional security of the Primitive Tribal Group (PTG) of these hamlets by supplying sapling of the nutritionally superior fruits and vegetables and imparting training in kitchen garden vegetables.

Road Map for the future

The road map of the University is to establish new colleges at Adilabad, Malyal and Mulugu. Plans are also afoot to establish new research stations (Chilli research station at Narsapur, Dryland Horticulture research station at Wanaparthy and Potato and Onion research centre at Zaheerabad. The university also expects to use modern technologies and ICT tools. The SKLTSHU strives for the upliftment of the farmers of Telangana with a mission "More crop per drop" and Doubling of Farmers income through horticultural crops.

TELANGANA'S QUALITY LIVESTOCK DEVELOPMENT

Registered under AP Societies Act, 1992 and placed under X schedule of the AP bifurcation act, Telangana State Livestock Development Agency (TSLDA) is functional with nine District Livestock Development Associations and two semen stations - at Karimnagar and Kamsanpally and one QC lab at Karimnagar.

Dr Manjuvani
CEO, Telangana State Livestock Development Agency

FROZEN SEMEN BULL STATION

A state of the art ISO 9001:2015 Quality Management Certified mega Frozen Semen Bull Station is located at Karimnagar. The semen station houses frozen semen collection of 133 High Yielding Indigenous and Exotic bulls of various breeds of cattle and buffalo. Indigenous breeds such as Gir, Sahiwal, Ongole; exotic breeds such as Holstein Friesian, Jersey, Crossbred HF & Jersey, and Buffalo breeds like Murrah and Mehsana are maintained here. This also includes an imported HF breed from Germany and Jersey bull from Netherlands.

The institution has achieved Self sufficiency in production of Murrah Frozen Semen Doses. After bifurcation, Telangana was completely dependent on other states for procurement of Murrah semen and incurred an annual expenditure of Rs. 1.00 Crore

FSDs MARKETING

In a major breakthrough, TSLDA has recently extended its market wings to sell the FSDs to other state Livestock Development Boards/ Agencies. TSLDA has a motto of Quality Service Delivery, which is assured by a State of the Art Semen Station, with ISO 9001:2015 Quality Management Certification.As on date, FSDs are being sold to the Madhya Pradesh Livestock and Poultry

Development Corporation, Karnataka Milk Federation Ltd.

ARTIFICIAL INSEMINATION

Artificial insemination is the process of collecting semen from High Genetic Merit bulls and manually depositing them into the reproductive tract of a female. The semen is frozen before being supplied to the field to perform AI. AI is the most affordable and biotechnologically proven technology to improve the genetic make in livestock. The AI is carried out by skilled and trained Artificial Insemination Technicians. It gives scope for adoption of "One calf every year" concept for sustainable income.

The AI services are carried out by both Gopalamitras and the Department. Gopalamitras is a novel concept introduced for the first time in the country. They are selected from among the rural unemployed youth who have basic qualification of SSC pass, and are imparted basic training on AI. Currently there are 1414 Gopalamitras in the state who are paid a monthly sustenance allowance of Rs. 8,500/- per month.

ESTABLISHMENT OF MAITRIS

The Government of India has sanctioned a total of 449 MAITRIs (MULTI PURPOSE AI TECHNICIANS IN RURAL INDIA) to Telangana under Rashtriya Gokul Mission to cover the uncovered breedable population through Artificial Insemination. As on date 256 No. MAITRIs are trained and established in their villages.

REFRESHER TRAINING PROGRAMME TO GOPALAMITRAS

Conception rate in AI is a key indicator to the success of the programme. All the Gopalamitras in the state are given refresher trainings annually in order to update their skills with a special focus on increasing the conception rates. TSLDA has requested GoI to have a quarterly orientation cum refresher training programme on INAPH uploading to the AI technicians in the field. GoI is kind enough to take up Orientation Programme by NDDB starting with Telangana state

IN-VITRO FERTILIZATION LABORATORY

TSLDA released an amount of Rs. 5.83 Crores to C.V.Sc, Rajendranagar .155 viable embryos have been produced and 109 embryos were transferred into surrogate mother.

GOKUL GRAM

TSLDA released an amount of Rs. 5.37 Crores to C.V.Sc, Rajendranagar. Construction of two head to head housing for dairy cattle, one Heifer / weaner shed (paddock type), calf pen, Admin Block, Manure pit, OH Tank, Sump and Milking parlour was under progress

and 80 percent works were completed. Whereas the works pertaining to feed godown & urine distillation unit are under progress. Similarly the works pertaining to vermi compost, biogas plant and Biogas operated Generator were completed and are under utilization

PILOT PROJECT ON ARTIFICIAL INSEMINATION USING SEXED SEMEN

The latest Advanced Reproductive Technology in Artificial Insemination is use of Sexed semen technology. The aim is to produce only female calves by completely eliminating the "Y" chromosome in the frozen semen. To understand the practicality of the technology and thereby promote mass adoption, TSLDA with support from TSDDCFL has commissioned a Pilot Project on Artificial Insemination using Sexed semen in Kamareddy district. It has been implemented in 10 mandals, covering a population of 500 indigenous cattle. 330 animals were inseminated with Sexed semen. 94% success rate has been reported.

Development and Propagation of Poultry sector of Telangana

Telangana ranks third in poultry production in the country with 14.82 billion eggs contributing 12.94% of national production. The commercial sector contributes about 94% of the egg production in the state. The annual growth rate in egg production was 8.17%, lower than the national growth rate of 10.19%. The total meat production was 0.85 MMT (livestock and poultry) with 9.86% of country's meat production. The poultry meat production in Telangana state was 0.43 MMT.

In Telangana, majority of chicken meat and eggs are produced from the intensive production system, which is based on high input costs in terms of technology, capital, chicken varieties, management, etc. Though poultry development has taken a quantum leap in the last five decades, the growth has been mainly confined to commercial poultry sector, which is centered in and around urban and peri-urban areas in the state. The commercial layer population in the state is about 46 million. On an average a total of 240-260 million broilers are placed every year in the state. The major poultry producing belts in Telangana state are Hyderabad including Rangareddy, Siddipet, Karimangar, Warangal, Suryapeta and Wanaparthy, however the breeder farms are located in and around Hyderabad only.

Role of ICAR-DPR, Hyderabad

The ICAR - Directorate of Poultry Research, Hyderabad, a premier institution under the aegis of Indian Council of Agricultural Research, initiated the research work on development of chicken varieties suitable for backyard poultry farming during 1992 and eventually developed a dual purpose chicken variety Vanaraja that was released in 1999. Vanaraja has revolutionized the rural poultry concept in India as the birds were accepted by the farmers across the country in different agro-climatic regions. Subsequently, Gramapriya, a brown egg layer variety was developed at ICAR-DPR, Hyderabad. The success of these varieties in the rural backyards has led to development of many other improved varieties by the agricultural/veterinary universities and ICAR institutions. The Govt. of India has considered backyard poultry as one of the potential tools for alleviating the protein malnutrition in rural and tribal areas and promoted backyard poultry through different developmental schemes.

DR. R.N. CHATTERJEE, Director

DR. U. RAJKUMAR, Principal Scientist ICAR-Directorate of Poultry Research, Hyderabad

Improved Chicken Varieties

ICAR-Directorate of Poultry Research, Hyderabad developed few promising improved chicken varieties suitable for rural poultry which were well accepted in the state of Telangana.

Vanaraja

Vanaraja is a dual-purpose chicken variety suitable for free range poultry farming in rural and tribal areas. A hardy bird with better immune competence is well suited for rearing under harsh and diversified climatic conditions. The annual egg production is about 100-110 eggs in free range conditions. The variety is well accepted in all agro climatic zones of the country including Ladakh, Jammu & Kashmir, Andaman-Nicobar Islands and the north-eastern region. *Vanaraja,* is the first improved chicken variety that was accepted across all geographical locations of the country. About 38 lakhs of Vanaraja birds were distributed to the farmers across the country. About 3.17 lakh parents of Vanaraja were supplied to Govt. agencies. A farmer can earn a net profit of Rs.8000/- from a unit of 20 Vanaraja birds

Vanaraja cock and hen

Gramapriya

Gramapriya a layer type variety developed for free range farming in rural and tribal areas. The Gramapriya hens are known for higher egg weight and egg production with an average egg weight of 55-60 g. Gramapriya is light in weight and livability is high. The annual egg production is about 160-180 eggs under field conditions in farmers backyards. About 30 lakhs of Gramapriya birds were distributed to the farmers across the country. About 2.05 lakhs of Gramapriya parents were supplied to Govt. agencies. A small farmer with 20 Gramapriya birds unit can earn a net profit of Rs. 11000/- as net profit.

Gramapriya cock and hens

Srinidhi

Srinidhi is a dual purpose variety developed for rural poultry farming and it has good potential for both growth and egg production. The annual egg production ranged from 140-150 eggs under field conditions. About 1.2 lakhs of Srinidhi birds were distributed to the farmers across the country. About 14.6 thousand of parents were supplied to Govt. agencies. A farmer can earn a net profit of Rs. 9000/- from a unit of 20 Srinidhi birds.

Krishibro

Krishibro is a multi coloured meat yielding bird developed for small scale intensive farming for meat production in rural areas. The birds are known for their organoleptic qualities of the meat. These birds are well adapted for harsh climatic conditions and perform well under low

Srinidhi cock and hens

Vanaraja has revolutionized the rural poultry concept in India as the birds were accepted by the farmers across the country in different agro-climatic regions.

Backyard Poultry - A Potential tool to alleviate Protein Hunger

Though majority of the production comes from the commercial sector, backyard poultry plays an important role in the nutritional security and livelihoods of the rural and tribal community of the state. Backyard poultry is a low input or no input activity which is characterized by rearing of chicken in small units (10-50 birds per household) primarily for the family consumption and social events. The native chickens grow slow and lay fewer eggs, but are widely accepted by the rural and tribal people across the country. The backyard poultry farming with improved chicken varieties or native breeds is gaining popularity in the recent past as a potential tool to alleviate protein hunger and generate subsidiary income among the rural and tribal people across the country. The backyard poultry population comprises of the native chickens (98 lakhs), improved rural chicken varieties (6.35 lakhs) and ducks (0.12 lakhs) in the state. The egg production from desi fowl was about 705 million and from improved chicken varieties was about 180 million in the state. The improved chicken varieties are promoted primarily by Indian Council of Agricultural Research-Directorate of Poultry Research (ICAR-DPR), Hyderabad, PVNR Telangana veterinary university, Hyderabad and other private firms.

Krishibro coloured broiler

plane of nutrition. The birds weigh about 1.5 kg at 6 weeks and 2.0 kg at 7 weeks of age with 2.0 Feed Conversion Ratio (FCR). The birds fetch premium price due to plumage colour. About 8.0 lakhs of Krishibro birds were distributed to the farmers across the country.

Vanashree

Vanashree was evolved from Aseel peela variant over the years**.** The birds are similar to native chicken with aggressive behavior and improved productivity. The annual egg production is about 170-190 eggs. The birds are preferred by the farmers for its aggressive behavior, meat quality and high survivability.

Native chicken breeds

ICAR-DPR, Hyderabad is actively involved in conservation and improvement of indigenous chicken breeds. Important chicken breeds like Aseel, Ghagus and Kadaknath that are distributed in the state to promote the *in situ* conservation in the farmers' field conditions.

Aseel: Aseel is the most popular breed of India and it is known for aggressive behaviour, fighting quality and majestic gait. Its breeding tract is located in coastal Andhra Pradesh, Chhattisgarh states. Aseel chicken are characterized and conserved under semi-intensive system of rearing at ICAR-Directorate of Poultry Research (ICAR-DPR), Hyderabad. The annual egg production of Aseel breed ranges from 55-66 eggs at institute farm, however production up to 90 eggs are reported in the literature.

Ghagus: It is a medium sized bird with good mothering ability and broodiness character. Its native tract is located in Kolar district of Karnataka and border areas of Andhra Pradesh and Karnataka. Annual egg production recorded was 116 eggs.

Kadaknath: Kadaknath is also known as 'Kalamamshi' due to its black coloured flesh. The home tract of this breed is in Jhabua and Dhar districts of western Madhya Pradesh. Its body size is small. The annual egg production of Kadaknath ranged from 120 - 140 eggs.

ICAR-DPR promoted backyard poultry

ICAR-DPR is the nodal agency for maintenance and supply of parents of Vanaraja, Gramapriya and Srinidhi varieties of chicken apart from supplying commercial day old chicks and fertile eggs. Parents are supplied to many Government agencies (AH depts., SAUs, CPDOs, ICAR institutions, DRDO etc.) wherein they produce chicks and supply to the farmers in their respective regions. Apart from providing the germplasm the institute undertakes consumer education programmes to popularize the technologies among the farmers. The institute participates in all poultry developmental activities across the country to popularize poultry farming among the farmers. The Directorate take up the extension activities through training programs, exhibitions, brochures, information booklets, television and radio programmes to popularize the technologies. The Directorate has established linkage with Telangana state developmental departments to effectively reach out to the farming community. The institute is receiving the feedback from the farmers and other stake holders and refining the selection /breeding programs continuously for further improvement in the productivity of the birds and to increase the consumer acceptability.

The institute is working with different NGO like WASSAN, Ekalvya Foundation, Centre for Collective development (CCD) etc. in the propagation and popularization of the improved chicken varieties. A cooperative society (SHG) named Tirupathi Riathu mutually aided cooperative thrift and credit society Ltd. Mankapur was registered with the help of CCD, Adilabad. Poultry farming is one of the components of the society in addition to other livestock and agriculture commodities. The institute is working with the industry to find out the solutions for the emerging problems of the industry. The institute is organizing interface meeting with the industry, farmers and different stakeholders to understand the problems faced by them and to find out the research solutions.

Education

The institute is supporting the higher education in terms of their research work as partial fulfilment of the research work in Masters and doctoral degree programs in poultry science, nutrition, genetics and breeding, health etc. The PVNR Telangana Veterinary University offers under graduate, graduate, master, doctoral programs in poultry Sciences in the state of Telangana. The institute organized regular training programs on various aspects of poultry for different stakeholders viz., Animal husbandry officers, extension functionaries, Trainers, technicians, farmers etc.

ICAR-Directorate of poultry Research is serving the country over the last 35 years in development and propagation of poultry sector in the country and in state of Telanagana in Particular. The institute is serving the poultry industry, backyard poultry, human resource development etc. for the development of poultry sector in the state.

ENVISIONING ZERO WASTAGE

What is the vision of Telangana State Warehousing Corporation?

The vision of Telangana State Warehousing Corporation is to provide and maintain adequate, scientific infrastructure facility to farmers for storage of their produce and other notified commodities. We also envision to facilitate easy accessibility of the farmers to minimize storage loss and wastage & to improve rural liquidity. We also want to support market to overcome from volatile market prices of Agricultural commodities to the possible extent.

SRI VEEDA SAICHANDER
Chairman, Telangana State Warehousing Corporation

What is the warehousing capacity of the state of Telangana?

Warehousing capacity of the Telangana as on March 2022

SL NO.	DEPARTMENT / PRIVATE GODOWNS	NO. OF GODOWNS	CAPACITY IN LMT'S
1	Telangana State Warehousing Corporation (TSWC)	50	6.93
2	Central Warehousing Corporation (CWC)	15	4.28
3	Food Corporation of India (FCI)	11	6.68
4	Agriculture Marketing Department Godowns	1167	24.85
5	Investor Godowns (IG) (Approximate)	95	26.57
6	Private Entrepreneur Godowns (PEG)	04	1.78
7	Civil Supplies Corporation (CSC)	36	0.76
8	Markfed	55	0.79
	TOTAL:	1433	72.64

How many warehouses in Telangana are equipped with modern technology and constructed according to the state of the art technology?

All State Warehousing Corporation, Central Warehousing Corporation and Food Corporation of India, PEG and AMC godowns are scientific godowns constructed for storage of food grains with pest free condition.

What are the services offered other than storage?

Other than storage we are not offering any other services currently.

How many farmers are utilizing this facility? Has it been able to improve the price realization of farmers' commodity?

Very few farmers are utilizing godowns to preserve their commodities. The SWC continues to extend special benefits to farmers by allowing rebate of 35% in storage tariff for small and marginal farmers and also earmarked 40% space for storage of Agricultural produce belonging to such farmers at SWC own warehouses.

What are the challenges faced by the warehouses in Telangana?

There aren't sufficient storage space available in the State. Besides this, there is also the challenge of unavailability of regular trained manpower in the warehousing corporation. The sector needs digitization of warehousing activity. There is also shortage of Hamalis in the godown for Handling and Transport activity.

Telanganaku HARITHA HARAM

"Telanganaku Haritha Haram" meaning, 'A green garland to the state of Telangana' is one of the most successful programmes of Govt of Telangana. With the goal to increase the green cover of the state to 33%, the government is adopting extensive plantation outside the notified forest as well as inside the forests. The government is involved in rejuvenation of Degraded Natural Forests. They have also been involving all sections of the society and building it like people's movement.

The action plan was to plant 230 Crore saplings -130 crore saplings outside the forest and 100 crore saplings inside the forests.

SMT SANTI KUMARI, IAS
Spl. Chief Secretary (Forest),
Ministry of Environment, Forests

Programme Highlights

The programme was launched by the Hon'ble Chief Minister, Sri. K Chandra Sekhar Rao in 2015.

It follows an End to end approach: Nursery – planting – protection – watering – casualty replacement. In order to strengthen the programme at grass root level, a provision for "Green Budget" has been made in the new "Telangana Panchayat Raj Act" and " Telangana Municipalities Act", 2019 to institutionalise implementation of plantations in each and every gram panchayat, municipality and municipal corporation in the state. Both the Acts provide for ear marking 10% of their annual budget as the "Green Budget" to take up plantations and nurseries. Government provided Tractors, inter alia for watering of the plants in Gram Panchayats. The duties and responsibilities of all concerned at level of local bodies have been clearly defined. In order to ensure raising successful plantations under the programme, a provision to ensure 85% survival of plants planted is made mandatory under the above mentioned Acts.

"Telangana Haritha Nidhi" (Green Fund) was established which was a first of its kind in the country. Given the phenomenal success of Haritha Haram, Hon'ble Chief Minister of Telangana announced yet another path breaking initiative of setting up of "Telangana Haritha Nidhi" a dedicated Green Fund, which aims at developing plantation infrastructure as well as projects on a much bigger scale , provide sustainability in the long run which will further enhance the Green cover and forest cover of the state. The fund will be free from budget control. Money into this fund would be

accrued by way of contributions from the elected representatives to Legislative Assembly, Legislative Council, Zilla Parishad, Mandal Parishad and Gram Panchayats, Municipalities and Municipal Corporations as well as from all Govt employees and people of Telangana. A certain fixed amount is levied on the services provided by the Government such as, licenses issued to Businesses, registration of properties, works contracts of Government etc .Thus, an independent revenue source, free from budgetary control was created. Needless to say, that this financial independence is one of the most important measures towards sustainability of the programme.

An electronic platform was created to monitor plantations end to end. All plantation sites are geo tagged and monitoring reports are available online at https: fmis.telangana.gov.in.

Local Bodies, Gram Panchayats/ Municipalities/ Corporations and all sections of the society ensured that people's participation was guaranteed.

Innovative practices & Major Achievements

Creation of Urban Lung spaces-Urban Forest parks

Telangana is a leader in the country in the protection & development of Forest blocks which are in the close vicinity of Urban areas. At 179 locations, 1.76 lakh acres are being developed at an estimated cost of Rs 700 Cr.

A plantation plan for densifying the forest cover on saturation basis is prepared with 1.82 Cr plants. The plantation will be completed this year.

Out of 1.76 lakh acres covered under this initiative, 1.6 lakh acres is located within HMDA area.

Awards & Recognitions:

- "India State of Forest Report", published by "Forest Survey of India" in Dec 2021 reported that the increase in Forest Cover in Telangana since 2015 is 6.85 %.
- Hyderabad city has been awarded the "Tree City of the World" by Arbour Day Foundation & Food and Agriculture Organization of the United Nations for two consecutive years 2020 and 2021.
- As per Niti Aayog's Sustainable Development Goals (SDG) India Index & Dashboard Report, 2020-21, Telangana has stood first in percentage of area covered under Afforestation as per Performance Index 15.2 under SDG 15 – Life on Land.

Decentralised Nurseries

14,900 nurseries have been established in all gram panchayats and wards of Urban bodies. 32.99 crore seedlings are available in these nurseries. Location of nurseries close to plantation sites ensures door step availability of plant material.

19,472 Palle Prakruthi Vanalu which are village tree parks of about 1 acre size have been grounded @1 per habitation. 2725 Bruhat Prakruthi Vanams which are much bigger village tree parks are being planned out of which 675 have already been completed.

91,838 Km of avenue plantation is raised out of which 11,975 KM is Multilayer avenue plantation.

A newly planted tree with a tree guard and tankers going from plant to plant to give water to plants are a common sight in Telangana. While driving on major roads and highways, one can recognise arrival into or departure from Telangana State by the presence/ absence of distinct green cover flanking the road.

Interesting spin offs of Haritha Haram are, on all important occasions, people have started gifting plants instead of flower bouquets. Birthdays of the Hon'ble Chief Minister and important leaders are celebrated by taking up massive plantation drive. A few celebrities have also come forward to adopt forest blocks and rejuvenate them.

Strong political will of the State Government is the key driving force behind the successful implementation of Telanganaku Haritha Haram programme in the state.

POLLUTION MANAGEMENT

After the creation of the new State of Telangana, State Pollution Control Board was constituted in June, 2014 under section 4 of Water & Air Acts. The Board is implementing Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981, Environment (Protection) Act 1986, Public Liability Insurance Act 1991 and various Waste Rules notified under E(P) Act. The State Board is assigned with various functions under sections 17 of Water and Air Acts which includes planning a comprehensive programme, advise the State Government and dissemination of information on prevention, control and abatement of pollution.

Considering the seriousness of pollution and its adverse effects, the State Government has taken up several initiatives to protect the Environment and Control the Pollution:

- Restriction on certain category of polluting industries in Hyderabad (within Outer Ring Road) and erstwhile Districts of Medak, Rangareddy, Mahaboobnagar and Nalgonda.
- Implementation of Zero Liquid Discharge systems in major bulk drug industries for treatment and re-use of treated effluents within the industry.
- Identification of suitable industrial areas for sector-wise relocation of industries away from habitation with all necessary infrastructure for Pharmaceutical, Bio-technology, Hardware Park, Medical Devices Park, Textile Park, Edible Oil and Rolling Mill.
- Single window clearance for establishment and operation of the industries within stringent time limits under TS-iPASS.

Telangana Pollution Control Board has effective redressal system to attend the complaints through Toll free number (10741) managed on 24/7 basis. The

DR RAJIV SHARMA, IAS
Chairman, Telangana State Pollution Control Board

Board has also constituted night patrolling teams to ensure no illegal discharge or dumping of wastes.

Creating Awareness

TSPCB celebrates International and National Environmental Days by organizing various environmental awareness programmes. The Board also conducts awareness programmes during various festivals.

The Board conducts various environment programmes and activities such as seminars, workshops, meetings, training programmes, green rallies, cycle rallies and competitions among the students by organizing quiz, painting, eassy writing & Debate. Short films on Plastic waste management, Solid waste management, Bio-medical waste management, Eco-friendly Ganesh idols, Vehicular pollution etc., were prepared for public awareness.

E-waste Management

E-waste is one of the fastest-growing waste streams. Any mishandling or improper / unscientific disposal of e-waste leads to environmental issues. Bulk consumers of Electrical and Electronic Equipments (EEEs) such as IT companies, factories, hospitals, Govt. depart-

Notified Policies for the Management of Various Wastes

- Solid waste management policy for providing clean and safe cities / towns.
- Policy on faecal sludge and septage management for treatment and disposal of faecal sludge.
- E-waste management policy to create awareness on management of e-waste and providing incentives.

ments are major generators of E-waste. Sensitization of Producers of EEEs is required to ensure channelization of e-waste from their products to authorized e-waste facilities for effective management. The same is achieved by implementing Extended Producers Responsibility (EPR) Policy. 32 Producer organizations in the State are issued with EPR authorisations. There are 15 E-Waste Dismantling units and 4 E-Waste Recycling units in Telangana. The Government of Telangana under E-Waste Management Policy, 2017 has provided incentives for setting up of Dismantlers / Recycling facilities.

Agriculture and Pollution

Agriculture is the main focus area in Telangana for economic development and upliftment of farmers. The Board encour-

ages usage of bio-degradable materials, chemicals, pesticides and fertilizers for agriculture purpose as the same will reduce the negative impact on Water, Air and Soil.

Agriculture in Telangana to a large extent depends on ground water sources for irrigation. Pollution Control Board has taken effective measures to ensure that the industries close to the agriculture area do not contaminate ground water.

In case of any incident of pollution, the Board also does finger print analysis of effluents to trace them to the industry concerned and take immediate action.

Challenges

The challenges faced by the Board are mainly due to the unplanned growth of industries during earlier stages of industrialization without adequate environment management systems and subsequent urban agglomeration around the industrial areas.

Air pollution with odour problem is the major concern due to large number of bulk drug and chemical industries located in cluster. Identification of source of pollution is also a major challenge as most of the industries in cluster are using same type of chemicals. To overcome this, the Board has implemented online monitoring system. GPS based vehicle tracking system is employed in vehicles carrying effluents, bio-medical waste and hazardous waste.

The Board is also encouraging common treatment facilities for effective treatment and disposal of waste generated by the industries. The organic hazardous waste which was earlier being incinerated is being sent to cement plants for co-processing thus converting waste to energy.

PROMOTING PLANT HEALTH MANAGEMENT

National Institute of Plant Health Management (NIPHM) is a national level institute under the administrative control of Ministry of Agriculture and Farmer's Welfare, Government of India established in the year 1966 at Hyderabad. It became an autonomous body in the year 2008 with the expanded scope of promoting environmentally sustainable Plant Health Management practices in diverse and changing agro-climatic conditions and Plant Biosecurity Management and Pesticide Management through capacity building programmes, besides providing inputs for policy formulation on Plant Health Management, Plant Biosecurity, Pesticide Management, Plant Health Engineering and Vertebrate Pest Management at state and national level and creating a pool of master trainers. NIPHM located in Telangana state is contributing towards facilitating the adoption of sustainable plant health technologies across the state.

Promoting Sustainable Plant Health Technologies

NIPHM is popularizing sustainable plant health technologies across the nation. NIPHM has organized thirty seven off-campus and on-campus training programmes for different Districts of Telangana during 2019-2021. The trainings are focused to demonstrate on Good Agricultural Practices, AESA and Ecological Engineering in IPM, on-farm production of biofertilizers, biocontrol agents, vermi-technology, nematode diagnosis and management and usage of various bio-inputs. About 1020 progressive farmers have benefited. For promoting organic farming, NIPHM had also organized certificate course on organic farming during 2020 and 2021 and trained 30 rural youth from Telangana state.

A licensed biofertilizer production centre, NIPHM distributed approximately 800 litres of biofertilizers through different KVKS, on campus and off campus field visits. As a part of biocontrol laboratory activity different biocontrol agents are distributed to farmers and officers of Telangana. Approximately, 14,325 predators and 211cc trichocards were distributed for management of different crop pests in Telangana state.

NIPHM is conducting IPM Model Village programme at Mohamadnagar and Amdapur village through which uses of bio intensive pest management strategies in different crops are explained to farmers. Under the technical guidance of NIPHM, a bio-control lab is under construction at KVK, Ekalavya foundation, Thuniki, Medak to promote and to create awareness on usage of bio-control agents among farming community.

NIPHM had also organized certificate course on organic farming during 2020 and 2021 and trained 30 rural youth from Telangana state

NIPHM is promoting organic farming in Chowdarapalli (Peri urban village), Ibrahimpatnam, Yacharam (Mandal), Rangareddy District. The institute has also been playing a key role in promoting plant health interventions such as macrobials (parasitoids and predators) and microbials (*Pseudomonas* and *Trichoderma*, biofertilizer and biopesticides) in horticulture crops (Brinjal, Bhendi, Tomato, Chilli and Gourds).Besides these , NIPHM is the only organization to identify the incidence of nematode problems in horticulture and worked with hundreds of farmers and growers. As part of regular programmes NIPHM has trained trained Telangana polyhouse farmers, government officials and nursery growers on different techniques to overcome the serious problems of nematode infestation. Skill development training on "Organic Farming" was conducted in association with DDS-KKVK, Zaheerabad, Telangana and trained 30 farmers.

DR SAGAR H SINGH
Director General, National Institute of Plant Health Management, Telangana

Promoting awareness in diagnostics of pests through Plant Health Clinics

During 2020-21, Plant Health Clinics were established each at 4 Districts (Warangal Urban (Panthini), Warangal Rural (Narsampet), Suryapet (Karivala) and Rangareddy (DHSO office) with the main centre is in NIPHM, Hyderabad. The institute has organized several off-campus training programmes/demonstrations on NIPHM developed techniques to create awareness among farmers in their daily farm activities and NIPHM developed kits were also distributed to the farmers. Under these, 36 training programmes have been conducted in Warangal Urban, Warangal Rural, Suryapet and Rangareddy Districts and nearly 650 farmers were trained and advisory solutions were given to 2116 farmers on plant protection.

Promoting safe use of pesticides

NIPHM involves in imparting knowledge and skills in Pesticide Management through various capacity building programmes to Insecticide Inspectors, Regulators, Insecticide Analysts, Extension Officials, Scientists of working in State Department of Agriculture of Telangana State. The division has a state of the art training and analytical facilities accredited as per the ISO/IEC:17025-2017. Samples of fruits and vegetables grown in and around Hyderabad are collected regularly and analysed in the laboratory for presence of Pesticide Residues, the data of which are made available to the general public through NIPHM website. Additionally the data is also forwarded to Commissioner of Agriculture and Horticulture so that action may be initiated by the Government, if residues are reported at above the regulatory limit.

Pesticide disposal is a major concern as improper disposal of pesticides and their containers pose risk to environment. NIPHM also helping the farmers of Telangana state by imparting training and awareness on safe use of pesticides during purchasing, storage, handling, spraying and disposal.

Promoting Safe and effective use of pesticides with appropriate equipment and methods

Exclusive training programmes on pesticide application techniques and safety measures were organized for Telangana Agriculture Extension officials by NIPHM. Apart from officers training, various training programmes on spraying techniques and safety measures were conducted for farmers. The awareness was created among many farmers during these training programmes.

NIPHM is bestowed with the responsibility of creating awareness, enhance human resource capacity in managing biosecurity threats among various stake holders.

NIPHM has also initiated a project to train selected spray operators in villages of the state to optimally use the chemical sprays. At present the project is running in Amdapur village (Moinabad Mandal) and Vanaparthi District of Telangana state. Further assistance is given to identify and apply pesticides only when it is necessarily required. With this, the overdose application, which contributes to residue issues in crops, would be extensively reduced. NIPHM has also recently initiated spraying practices through advanced technologies like drones. The training is being initiated to various stakeholders in effective usage of drones in agriculture.

Promoting vertebrate pest management techniques

NIPHM have conducted several trainings to farmers on rodent and wild boar management at Madanapuram, Gaddipally, Jammikunta and Warangal. Around 348 farmers were trained during last 2 years in Telangana state. Different modules for management of wild boar were studied in maize and sunflower crops as an in-house project. NIPHM conducted and completed a research at D.Dharmaram village of Medak District of Telangana for Kharif and Rabi season in maize and sunflower crops. Through trainings the outcomes form the research were popularized to officers and farmers. The institute also trains pest control operators and extend 15 days certificate course on Urban Integrated Pest Management

Promoting export potential of agricultural/ horticultural commodities

Plant Biosecurity is a set of measures designed to protect the plants against the introduction of exotic / invasive pests into the country and once introduced, deal with them in containing and eradication. Realizing the growing importance and need for strengthening the agriculture biosecurity, NIPHM is bestowed with the responsibility of creating awareness, enhance human resource capacity in managing biosecurity threats among various stake holders. NIPHM is also providing trainings on export/ import procedures of agricultural/ horticultural commodities to farmers and officers of the state regularly. Recently NIPHM have organized phytosanitary issuing authorities training to officers of Telangana state.

Safe fumigation and stored pest management

In India, post –harvest losses caused by unscientific storage, insects, rodents, microorganisms *etc.*, account for 10 % storage losses. NIPHM is giving hands on training to officers and farmers of Telangana state in safe stored pest management. Taking the timely preventive actions for biotic and abiotic factors can be very effective in reducing the storage losses.

The primary aim of NIPHM is to minimize the loss of agricultural crops from the ravages of insect pests, diseases, weeds, nematodes, rodents, *etc.* and to shield agricultural bio-security from the incursions and spread of alien species, through integrated plant health management. The Institute also seeks to facilitate exports of Indian agricultural commodities to global markets through promotion of Good Agricultural Practices, particularly with respect to plant protection strategies and phytosanitary measures.

COMMERCIAL FOREST PLANTATIONS

Eucalyptus Nursery

Eucalyptus open Nursery

The forest development corporation is a pioneer in raising commercial tree plantations of forest species. The corporation has also ensured sustainable production from the same piece of land over the last 5 decades. With changing times and technology, the corporation has withstood and adopted to the changing situation and reached financially viable, socially acceptable and environmentally sustainable stage. This is also serving as the demonstration plots for the farmers to adopt the practices in their lands.

Established in the year 1976 with a major objective of supplying pulpwood to the paper mills of the state for the sustainability of paper industry and thereby ensuring employment opportunities in the industry, the journey has been long. The first plantations of Bamboo have started flowering now, after 40 years. Likewise in Eucalyptus, the seed origin plantations are gradually replaced with high yielding varieties over the decades of research and selection methods.

Currently the TSFDC is cultivating 60000 acres of Eucalyptus plantations and about 15000 acres of Bamboo in the degraded forest areas taken on lease from the forest department. The corporation is now in the process of getting the FSC certification for sustainable production from the international Forest Stewardship council for global acceptance of products made from the wood supplied from the corporation.

DR. G.CHANDRASHEKAR REDDY, IFS
Vice Chairman & Managing Director,
Forest Development Corporation Limited

Eucalyptus plantations

All started in 1970s when seed origin plantations were raised for which the productivity was less than 10 tonnes per hectare. The clonal production technology in 1990s paved the way for clonal plantations with the yields up to 100 tonnes per hectare. The clone no. 3, 7 and 10 are the most popular ones and the same are produced in corporation nurseries and ITC nurseries. Farmers have planted them in thousands of hectares reaping the benefits. However, these clones became susceptible to the fire and gum diseases and insect gall diseases leading to decline in yields. Better clones have been identified and clonal trial plots are laid in different areas. From 2021, new promising clones like EX X ED, EC X ED, Clone no 283, clone no 405 were planted and are now adopted by the farmers. The yield expected varies from 100 tonnes per hectare and above. The aim is to reach 200 tonnes per hectare in near future.

Bamboo plantations

Bamboo plantations were raised to meet the demand at the paper mills but currently papermills are not consuming bamboo as they have completely switched over to Eucalyptus, Subabul , Casurina etc. Currently major use of bamboo is in the horticulture for using as props and in construction for scaffolding. The new species are introduced in place of traditional *Dendrocalamus strictus*. The new species are promising but requires irrigation. Species like the *Bambusa tulda* and *Bambusa balcoa* have been tried since last year. Since the spacing adopted is 5x5 mts, the interplanting will be done with casuarina which can be harvested along with the first harvest of bamboo at the end of fourth year. *Casuarina jhunjhuniana* an inland variety has nitrogen fixing ability. In irrigated areas an experimentation is being done with cultivation of Agar-Agar this year in *Bambusa tulda* plantation.

Currently the TSFDC is cultivating 60000 acres of Eucalyptus plantations and about 15000 acres of Bamboo in the degraded forest areas taken on lease from the forest department

RRR region commercial plantations

The Eucalyptus planted areas within the proposed RRR are now been taken up for replacement on completion of rotation period, with the miscellaneous forest species of commercial nature. While choosing alternative species for planting the commercial aspects also kept in mind for term sustainability of the corporation. The sandal wood in combination with *Murayya paniculata* (Curry Leaf), inland *Casuarina jhunjhuniana* and *Annona squamosa* (Custard apple) are planted with appropriate spacing. Casuarina shall be harvested in the fourth year to get returns to the corporation. The Murayya will be retained as permanent host with commercial returns based on periodical harvest of leaf. The *Annona squamosa* which is a native species is expected to yield annually. The sandal wood shall be a long rotation crop.

Sandal wood Plantation

Sowing of sunhemp seeds

The most important contribution of the sandal apart from its costly wood, is

natural regeneration in surrounding areas of Hyderabad. Where ever there is a tree of sandal wood there is profuse natural regeneration of sandal wood as its fruits are cherished by birds and they cause dispersal of seed for regeneration. Therefore this will also be a great contribution in greening Hyderabad in a natural way.

The Rosewood, Redsanders, Bamboo and Teak is also promoted in RRR region with an interplanting of custard apple and Casuarina.

Yadadri model plantation on Miyawaki principles

Though best and successful plantations are raised, nothing can match the natural forest interms of its complexity and diversity. Therefore an attempt is made to create a natural forest with local forest species. The principles are based on the Miyawaki model.

- High density planting: 10000 plants per hectare are planted in as against the traditional practice of 1100-2500 plants per hectare
- Local species planting: local species are best adapted to the local climate. Therefore only local species are proposed for planting
- Three tier planting: herbs, shrubs and trees should be part of planting. Also seed to sapling of any size can be planted. Same species of different heights can be planted
- Random planting: no defined spacing is adopted for planting, the method of planting is random as it occurs in nature
- Soil enrichment: to sustain growth of this density of plants, the soil is to be enriched make it alive and take up soil and moisture conservation measures in the site

Butterfly Garden

Within an year extraordinary results are seen and area has become safe home for reptiles, birds, insects, squirrels and so on. They bring in seed from neighbourhood areas and further adds to regeneration. The soil is alive with all microbes and nutrient cycle active with added leaf litter from plants and ensures sustainability. One such area in every village can be a biodiversity "**Genepool"** for that village. The farmers who want to own forest can adopt this model.

Green Energy from wasted biomass from the plantations

It is proposed to establish a pilot project on a PPP mode for using the lops and tops and bark available in the Eucalyptus harvested plantation sites and also from the branches of bamboo obtained while harvesting bamboo and the weed material. The pellets made from this waste material is used as the green coal in the boilers to generate heat/power. This will give additional revenue for the corporation and adds to the environmental sustainability as it saves the burning of the coal to that extent.

Biodiversity Conservation

The Botanical garden in Hyderabad is under transformation as Botanical paradise to the visitors. A minimum of 1000 species shall be planted during this year on a thematic approach. Theme parks like Bhojapatra vanam, Pencil and Rubber garden, Kagaz garden, Pan garden, Bathukamma garden and so on like 50 themes shall be introduced. About 18 forest types shall be planted in this season and 7 types of ecosystems and plant evolution aspects shall be demonstrated making it a botanical paradise.

The corporation thus has not only improved its work culture and adopted technology with changing times but also it is adding to the sustainability of the industry, environment and employment to the local people.

AGRICULTURAL CREDIT ASSISTANCE PROGRAMS IN TELANGANA

DR. NETHI MURALIDHAR
Managing Director
Telangana State Cooperative Apex Bank Ltd

Telangana State Cooperative Apex Bank Ltd (TSCAB) as a leader of cooperative credit structure in the state of Telangana, has become a pioneer and an emerging force in Cooperative sector with its year on year achievements, playing a vital role in contributing to the overall development of the state in accordance with the state objective of achieving golden Telangana.

TSCAB was formed on 01.04.2015, consequent to the reorganization of the State of Andhra Pradesh and formation of a new State Telangana in the year 2014, mainly catering to the needs of rural folk dependent on agriculture and its allied activities apart from rural artisans in the state of Telangana.

Bank Structure

Telangana State has three tier Cooperative Credit Structure (TSCAB – DCCBs – PACS). The Bank, as a leader of the CCS in the Telangana State, provides leadership and refinance support to nine DCCBs affiliated to it, to fulfill the objective of making available timely and adequate credit facilities to the farmers and other rural population of the State, through 800 PACS affiliated to the DCCBs.

Services offered by TSCAB

TSCAB provides all types of credit required by the farming community in the State of Telangana. It mainly includes crop production loans (Seasonal Agricultural Operations), Agricultural Investment Credit, loans to Weaver Societies, Self Help Groups, Joint Liability Groups, Non-farm sector loans, Gold loans etc.

Under the non-credit services, the PACS are offering various services including supply of agricultural inputs (fertilizers, seeds, pesticides) etc., and procurement of agricultural produce as an agent of the Civil Supplies Department, Govt. of Telangana.

More than 80% of the loans given by the cooperatives are for agriculture sector only.

Cooperative banks play an important role in improving the financial inclusion because of their wider network and vast presence in almost all the villages. Membership of PACS is about 30 lakhs out of which over 12 lakh farmers regularly avail various services from the cooperative credit institutions.

Vision of TSCAB

To be the "Best State Co-operative Bank" in the country, providing effective leadership, guidance, training and refinance support to the Co-operative Credit Structure (CCS) for sustainable growth and all-round development of CCS and also the State of Telangana.

Loan Waiver and its implications

Extending of waiver to borrowing farmers either in the form of principle or interest is detrimental to the banking principle, since majority lending's of the Cooperative Credit Structure is aimed at priority lending. It disrupts credit discipline of farmers who can turn into willful defaulters expecting next loan waiver scheme, which is bad for economy in general and banking industry in particular. The focus of such schemes is on small and marginal farmers ignoring dominant role of money lenders and informal credit sources in the rural economy. The impact of extending of such waivers will have major effect on the functioning of the banks and its very existence. Instead schemes like Rythu Bandhu can be encouraged which are granted without any obligation for repayment.

The faith of the farmers can be restored in the banking organization by extending innovative employment/revenue generating credit like financing for Agri-infra structure, diversification towards high value crops, increasing production of live stocks, thus improving quality of rural life.

ADVOCATING ENVIRONMENT PROTECTION

Environment Protection Training and Research Institute (EPTRI), was established in 1992 under tripartite cooperation between Government of India (GoI), State Government and Swedish International Development Agency (SIDA). EPTRI, an autonomous institution comes under Department of Environment, Science and Technology of the State Government, Telangana and is a self-sustaining organization. EPTRI is managed by a Board of Governors headed by the Chief Secretary to the Government of Telangana. The Chief Executive Officer (CEO) is designated as Director General and holds the rank of Principal Secretary to the Government of Telangana.EPTRI provides training, consultancy, applied research services and extends advocacy in the area of environment protection.

EPTRI offers services in the area of Environment Baseline studies (BLD), Environment Impact Assessment studies (EIA), Solid Waste Management, Environment Quality Mapping, analyses of air, water, wastewater soil, hazardous water, noise, Plant Tissue culture, socio-economic assessment, vulnerability Assessment studies etc.

Training programmes

EPTRI conducts training programmes sponsored by Ministry of Environment, Forest and Climate Change (MoEFCC), GoI , CPCB and Indian Technical and Economic Cooperation Programme (ITEC) programmes under Ministry of External Affairs, GoI in the areas of Climate Change, and Environment Impact Assessment, Solid waste management etc.

EPTRI also conducts Green Skill Development Progammes (GSDP) sponsored by Ministry of Environment,

Smt. A. Vani Prasad, IAS Principal Secretary to Govt. & Director General, EPTRI is addressing the officials from DoA, PJTSAU, CRIDA and ICRISAT during the Workshop on Mandal Level Risk and Vulnerability Assessment and District Level Climate Adaptation Plans for Telangana State in Agriculture sector

Forest and Climate Change (MoEFCC), GoI in the areas of Pollution Monitors (Air and Water), ETP/STP/CETP Operation and Maintenance Water Budgeting & Auditing, Waste Management, Environmental Impact Assessment, Sustain and Enhance Technical Knowledge in Solar Energy Systems, Plant Tissue Culture Technique and its Applications, Peoples Biodiversity Register, Valuation of Ecosystem Services and Green GDP, Para taxonomy etc.

SMT. A. VANI PRASAD, IAS,
Principal Secretary to Govt. & Director General, EPTRI

Spreading Awareness

By celebrating all the international days of environment importance viz., World Environment Day, World Water Day, World Earth Day etc., EPTRI has been creating awareness regarding environment. They regularly invite students from colleges, schools etc., to EPTRI and educate them on environment protection.

Putting them in practice, as a part of soil moisture conservation activities, EPTRI constructed the Rain Water Harvesting Structure (RWHS) :

- Check dam
- Gabion structure along without pond
- Gabion structure along with pond
- Rock fill dam
- Earthen check dam
- Collection pond
- Contour trenches and Contour bunding
- Farm pond
- Soil recharge structures
- Percolation tank
- Rain water harvesting system to one injection well
- Rain water harvesting system to two injection wells
- Basin recharge
- Saucers
- Weir and Collection Pond
- These RWHS structures likely to harvest around 3 cr litres of water

Partners and Associates

EPTRI has associates with many research institutes. Signed MoU with the following reputed institutes:

- International Crops Research Institute For The Semi-Arid Tropics (ICRISAT), Hyderabad
- Professor Jayashankar Telangana State Agricultural University (PJTSAU), Hyderabad
- Forest College And Research Institute(FCRI), Hyderabad
- National Institute of Tourism And Hospitality Management (NITHM), Hyderabad
- Administrative Staff College of India (ASCI), Hyderabad
- Jawaharlal Nehru Technological University Hyderabad (JNTUH), Hyderabad

Agriculture project -Climate Change Adaptation Project

Environment Protection Training and Research Institute (EPTRI) is executing the project “Resilient Agricultural Households through Adaptation to Climate Change in Mahbubnagar District, Telangana (RAH ACT)” under National Adaptation Fund for Climate Change (NAFCC), Ministry of Environment and Forest & Climate Change (MoEF& CC), GoI. The cost of the project is Rs. 24 Cr. EPTRI is the executing entity of project. Department of Agriculture (DoA), Professor Jayashankar Telangana State Agricultural University (PJTSAU) and ICRISAT are the technical partners in the projects. NABARD is the implementing entity.

The objective of the project is to enhance the livelihoods of farming community by implementing climate resilient agricultural interventions in 15 targeted villages in Mahbubnagar, Wanaparthy and Nagarkurnool Districts covering 3438 farmers. As per the project guidelines, 50% subsidy is being provided by MoEFCC, GoI and 50% by farmer contribution. As the farmer was unable to pay 50 % (ranging from Rs.57,500 – Rs.62500), Govt. of Telangana has come forward and issued GO mentioning 25% additional subsidy of 10.17 Cr, which has helped the farmer and more farmers joined project and improved their livelihoods

EPTRI also secured the climate change Adaptation and Mitigation Forest project Restoration of Degraded Landscape to Natural Systems for Climate Resilience and Livelihood Improvement of vulnerable communities in Telangana. The project is being implemented in association with Forest Department, Govt. of Telangana, which further strengthens the ongoing Haritha Haram, a large-scale tree-planting program implemented by the Government of Telangana to increase the tree cover in the State from 24% to 33%.

EPTRI has prepared the State Action Plan on Climate Change (SAPCC) for the State in 2015 and is being revised as per the directions of MoEFCC, GoI to all the States. EPTRI State of Environment (SoER) Report for the State.

EPTRI has been in the forefront in protecting the environment in the State by securing Environment Clearances (EC) for various SCCL mines, irrigation projects, handling the solid waste, action plan on climate change, securing climate change adaptation and mitigation projects etc.

Accreditations and Recognitions

- Nodal agency for climate change for the State of Telangana
- Strategic Knowledge Centre for Climate Change under DST project
- NABL (National Accreditation Board for Testing and Calibration Laboratories) in the fields of Chemical and Biological Testing
- Scientific and Industrial Organization (SIRO) – recognized by Department of Scientific Research, Government of India.
- Environmental Laboratory under the Environment Protection Act, 1986.
- State Laboratory under the Water (Prevention & Control of Pollution) Act, of 1974.
- EPTRI is certified ISO 14001: 2015, ISO 9001: 2015, ISO 45001: 2018

EIA Sectors under NABET accreditation for the following sectors :

- Mining of minerals including Open cast/ Underground mining
- River Valley, Hydel, Drainage and Irrigation projects
- Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes
- Common Municipal Solid Waste Management Facility (CMSWMF)
- Building and construction projects
- Townships and Area Development projects

Major Projects

- Baseline studies (BLD) for The Singareni Collieries Company Ltd (SCCL)
- Environment Impact Assessment (EIA) projects SCCL coal mines
- Environment Impact Assessment (EIA) projects TSMDC Sand mines
- Environment Impact Assessment (EIA) Kaleshwaram Irrigation projects
- Environment Impact Assessment (EIA) Industrial Estate - Hyderabad Pharma city
- Resilient Agricultural Households through Adaptation to Climate Change in Mahbubnagar District,
- Restoration of Degraded Landscapes to Natural Systems for Climate Resilience and Livelihood Improvement of Venerable Communities in Telangana
- Preparing State Specific Action Plans for Water Sector for the States of Telangana, Nagaland and Mizoram