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Strategic Role of Indian State Agricultural Universities (SAUs) in Rural Development: A Review

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ABSTRACT

State Agricultural Universities, (SAUs), in India, have adopted the U.S. land-grant model to meet its goals. They are autonomous organisations with state-wide responsibility for agricultural education, research and extension education. Through teaching, research and extension activities the 64 SAUs across 28 states of India are significantly contributing to agricultural production and productivity of their respective states directly and therefore to the rural development. SAUs rural development strategies include technologies and innovations, extension and human resource development. Regional Agricultural Research Stations in various agro-climatic zones have strengthened research-extension-farmer (REF) linkages. KVKs under administrative control of SAUs serve as farm science centres of their respective districts. In this paper, the rural development approaches of Acharya N.G. Ranga Agricultural University, Guntur Andhra Pradesh is detailed. Furthermore, strategic planning by the SAUs to increase their effectiveness for direct rural development should be sustained.

Key words: Agricultural extension, Krishi viigyan kendras, Rural development, Strategies, SAUs.

India has one of the largest and well-coordinated public agricultural research systems in the world. Its primary agencies are organized under the Indian Council of Agricultural Research (ICAR) and state agricultural universities (SAUs) (Suresh Pal *et al.,* 2012). The Indian National Agricultural Research and Education System (NARES) mainly consists of research institutes under the Indian Council of Agricultural Research (ICARs), State Agricultural Universities (SAUs) and *Krishi Vigyan Kendras* (Farm Science Centers), all of which strive for agricultural growth and prosperity nationally. SAUs are major partners in the growth and development of agricultural education research under the NARES. State Agricultural Universities, (SAUs), in India, have adopted the U.S. land-grant model to meet its goals. They are autonomous organisations with state-wide responsibility for agricultural education, research and extension education. The first SAU in India was established at Pantnagar, Uttar Pradesh in 1961; there are currently 64 SAUs, three central agricultural universities, (having seven N-E states as its jurisdiction), four deemed universities and four central universities imparting agricultural education across the 28 states of India, (ICAR, 2020). Furthermore, there are 650 agricultural colleges in India (Mishra, 2020). To provide a legal base for establishment, function and uniformity of agricultural universities, ICAR developed the 'Model Act for Agricultural Universities in India' in 1966 which has undergone revisions in 1984, 1994 and 2009 (ICAR, 2010). In a few states, there are more than one SAU catering to the needs of farmers of a particular region of a state. For Example: The state of Karnataka has three agricultural universities operating to serve farmers of the regional language, 'Kannada'. University of Agricultural Sciences, Bangalore operates in 10 southern districts of the state, whereas, UAS, Dharwad operates in seven districts of Northern Karnataka. Additionally, the third SAU *i.e.,* UAS, Raichur located in Karnataka state operates in six districts of the Hyderabad-Karnataka region to serve the farmers of Telangana and Karnataka states. In a few states,subject matter (sectors such as horticulture and animal husbandry) played a major role in establishing new SAUs to farmers of a sector. For Example, in the state of Andhra Pradesh, a separate horticultural university, (Dr. YSR Horticultural University, Tadepalligudem) and a separate veterinary and animal husbandry university, (Sri Venkateswara Veterinary University, Tirupati) exists apart from the agricultural university (Acharya N.G. Ranga Agricultural University). Each SAU is a state institute that receives funding from the GoI through the ICAR, (respective state governments and other sources). The organizational structure of each SAU

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consists of a Chancellor, Vice-Chancellor, Board of Management, Deans, (faculty wise and deans of student affairs), Director of Research and Director of Extension. The Chancellor is the Governor of the state; the Vice-Chancellor is responsible for implementing the overall mandatory activities of the SAU and from time to time they report to the Board of Management through regular board meetings. The Deans and Directors assist the Vice-Chancellor in implementing the mandatory activities *i.e.* teaching, research and extension programs. Although the organogram of each SAU differs slightly from state to state, generally, the organizational structure is similar. Over the 59 years of their existence, SAUs have made numerous achievements in each of the areas of teaching, research and extension. The mandate of the State Agricultural Universities envisages a strong integration of teaching, research and extension. ICAR ranks SAUs based upon 33 parameters pertaining to teaching, research and extension excellence. The main role of SAUs is to not only aid in state-wide agricultural production, but to aid India in agricultural and rural development nationally.

The teaching programme

SAUs have developed the capacity to train students through the PhD level. Most SAUs have more than six constituent colleges and campuses offering graduate, post-graduate and PhD courses. There are currently, 30,000 students completing studies from in more than 500 agricultural colleges throughout the country (The Hindu, 2016). The Fifth Deans Committee has made efforts to include relevant practical skills and entrepreneurial aptitude as a way to impart confidence among graduates of SAUs (ICAR, 2017). Accreditation is given to ensure the quality of higher agricultural education in SAUs and its constituent colleges. Accreditation of Agricultural Universities is a continuous process and since the formation of the constitution of the The National Agricultural Education Accreditation Board (NAEAB) in 1996, 43 SAUs have been accredited (NAEAB, 2020). The faculty members of SAUs actively participate in summer and winter schools and short courses sponsored by ICAR in the disciplines of agriculture, veterinary sciences, animal husbandry, fisheries, food technology, *etc*., for qualitative improvement of their pedagogical skills and also to increase their knowledge in both specialized and emerging fields, thereby contributing to the development of skilled human resources for making research and education more relevant. Through the National Academy of Agricultural Research Management (NAARM), newly recruited faculty members undergo foundational courses (FOCFAU) in 'Agricultural Scenarios', (NARES) which consists of the basics of learning, teaching, instruction, educational technology, e-learning, research project management, transfer of technology and, administration and finance management.

The faculty members of the SAUs also serve as 'resource persons' for the SAMETIs of the Dept. of Agriculture, thus, involve in training of extension personnel of their respective states. SAUs have Open and Distance learning courses (certificate and diploma), to directly teach farmers in various agricultural and allied sciences. Through Massive open online courses (MOOCs), SAUs instruct various stakeholders through the duration of a single course.Several of the ICAR initiatives implemented by SAUs such as Rural Entrepreneurship and Awareness Development Yojana (READY), Experiential Learning Programme (ELP) and Rural Agricultural Work Experience (RAWE) and in-plant training are relevant. The Student READY programme has been introduced in all State Agricultural Universities as an essential prerequisite for the award of a degree in order to ensure students hands-on experience and practical training. Few scientists of the SAUs are recipients of the prestigious C.V. Raman fellowship awarded by the UGC (University Grants Commission) for post-doctoral research in the USA upto 12 months. The recipients of C.V. Raman fellowship will enable young Indian researchers to carry out a clearly defined research project and acquire newly emerging research techniques in agriculture domain in the USA.

The research programme

Under NARP (National Agricultural Research Project), the country is divided into 127 agro-climatic zones.Directorate of Research is the nodal agency of the SAU and directs frontline research activities. Regional Agricultural Research Stations (RARSs) are established in several agro-climatic zones to provide need-based and location-specific research. Many SAUs are actively involved in climate smart agriculture research and also have projects related to dryland agriculture. Zonal Research and Extension Advisory Councils (ZREACs) and Research and Extension Advisory Councils (REACs) meet annually to identify the thrust areas for research in various disciplines, identify research gaps and to also provide a framework for faculty research projects. All India Coordinated Research Projects (62 No.) of the Indian Council of Agricultural Research (ICAR), engaging in multi-location trials aremostly based in SAUs and are also administratively controlled by the SAUs. Furthermore, several SAUs have also accommodated the projects sponsored by the Department of Bio-technology, Department of Science and Technology and other national and international agencies.

The extension programme

The main agenda of SAU extension programmes is to reach farmers through state extension services. Directorate of Extension is the nodal agency of SAUs and they promote agricultural development through fast transfer of technology programmes by providing timely information, consultancy and training to the extension personnel of line departments. SAUs not only provide technical support to line departments but also have convergence programmes with line departments and NGOs. The multi-disciplinary team of

scientists at various extension centres will coordinate the activities with the department of agriculture and allied departments. All SAUs support AIR, print media and electronic media for dissemination of agricultural and allied sciences information. Moreover, colleges, research stations and extension centres of SAUs adopt villages and in turn, these villages experience multifaceted transformation.As a part of Training and Visit system (T & V), Monthly Zonal Workshops (MZW) are conducted by scientists of Agricultural Research Stations (ARSs) to build up technical skills of extension personnel (ADAs and AOs) of the Department of Agriculture. The MZWs thoroughly discusses difficulties faced by field extension personnel and formulates recommendations for major crops for the next two fortnights.

Saus role in rural development

Rural Development refers to the process of improving the quality of life and economic well-being of people living in rural areas. SAUs play both direct and indirect roles in rural development.

Agriculture is a basis of livelihood and is the primary occupation for most rural families in India. SAUs important role is to improve crop production and productivity of states, for food and nutritional security of both rural and the urban populations. SAUs encourage crop diversity and growing commercial crops for the export market to allow farmers to earn foreign currency. Apart from food and nutritional security, the main agenda of SAUs in rural communities consists of the following:

• To play a role in providing critical access to the knowledge and information necessary for rural populations to increase the productivity and sustainability of their agricultural production systems and thus, improve the quality of their lives and livelihoods.

SAUs rural development strategies

Lately, Universities are developing strategies to intensify and widen their contribution to learning and development for rural people. In addition to their roles in courses curriculum development and training teachers, universities also play an essential role in conceptualizing development problems and policies (David and Keith, 2004).

• Technology development

The main goal is to consistently generate and improve the technologies for increasing production in agriculture and the welfare of rural folk. SAUs have a wide network of research stations and Krishi Vigyan Kendra (KVKs) operating in every district of the country. Research Stations (Regional Agricultural Research Stations and Agricultural Research Stations) are established based on agro-climatic zones and they carry research work on major crops and location-specific technologies. KVKs are referred to as 'Farm Science Centres' and serve as transfer technology centres within their jurisdiction. Presently, India has a total of 716 KVKs working in 11 zones and in a few districts more than one KVK is in operation for carrying out mandatory activities (ICAR, 2020). All SAUs also forecast weather information to disseminate among farmers.

• Extension

Assists in the dissemination of improved technologies to the farmers of the states through government development departments is the main goal. SAUs promote poverty eradication in rural areas by participating in various development programs of the state govt. and Dept. of Agriculture programs. SAUs support and promote efforts to integrate modern technologies with traditional and indigenous knowledge for sustainable rural development. SAUs document traditional knowledge, including indigenous technical knowledge (ITK) practiced by farmers in various domains of agriculture such as soil and water conservation, crop production, crop protection, weed management, organic farming, *etc*. SAUs converge with local N.G.Os for the dissemination of agricultural and allied sciences information.

• Human Resources Development

All SAUs offer undergraduate, postgraduate and PhD programs in their colleges and offer courses of various subjects such as agriculture, agricultural engineering and technology and home science to help create trained manpower for rural development.Some SAUs offer agribusiness management and polytechnic courses. Also, students who have successfully graduated from various universities have been inducted into the Dept. of Agriculture; Banks and Asst. Professors and Scientists of SAUs, scientists in ICAR institutes and multi-national company jobs. Women are enrolling in agricultural courses in various SAUs and make up a considerable proportion of the trained manpower as well.

Agricultural extension for rural development

Extension is an informal educational process directed towards rural populations. This process offers advice and information to help them solve their problems. Rural family is the fundamental unit of various SAU agricultural extension programmes. Agricultural extension also aims to increase the efficiency of the 'farm family', increase production and generally increase the standard of living of the farm family.

The major emphasis of agricultural extension is on conducting front line extension activities *viz*., testing and the introduction of new technologies in the farmers' fields, dissemination of technical information, imparting training to the extension personnel, rural youth and farmers, developing innovative extension methods and strategies. SAUs prepare crop contingency plans for both *Kharif* and *Rabi* seasons.

The agricultural extension wing of SAUs provides timely information on weather, forecasts prices of major crops for *Kharif* and *Rabi* seasons, pest and disease outbreak forecasts, bulletins, market intelligence, *etc*. All SAUs have agro-meteorology centres to forecast weather and release weather-related advisory bulletins to the farmers of their state. Directorates of Extension in SAUs encourage literacy

in rural communities and ensure provision of vocational training to rural youth through KVKs. Vocational training can create employment opportunities in the long run for rural youth. KVKs and Research stations adopt villages for at least three years for various transfer of technology(ToT) programs. As KVKs are established in remote areas, scheduled caste and scheduled tribe farmers are extensively covered. Home scientists of KVKs are promoting balanced nutritional diet practices, increasing nutritional knowledge and increasing the diversity and quantity of food consumed by rural families. The mandate of the KVKs is technology assessment and demonstration for its application and capacity development through activities such as OFTs, FLDs, capacity development of farmers and extension personnel and providing farm advisories using ICTs and other media.

The first KVK was established in 1974 in Puducherry. The number of KVKs has risen to 716with additional KVKs being established in newly created districts and some larger districts. The KVK scheme is completely financed by the Govt. of India and they are sanctioned to Agricultural Universities, ICAR institutes, related Government Departments and Non-Government Organizations (NGOs) working in the field of Agriculture (Source: KVK Portal, 2020).

KVKs are an important part of the National Agricultural Research System (NARS), which aims to assess location-specific technology modules in agriculture and allied enterprises, through technology assessment, refinement and demonstrations. KVKs have been functioning as knowledge and resource centres of agricultural technology supporting the initiatives of the public, private and voluntary sector, for improving the agricultural economy of districts and linking the NARS with the extension systems and farmers.

The mandate of KVK is technology assessment and demonstration for its application and capacity development

To implement the mandate effectively, the following activities are envisaged for each KVK:

1. On-farm testings (OFTs) to assess the locationspecificity of agricultural technologies under various farming systems.
2. Frontline demonstrations (FLDs) to establish production potential of technologies on the farmers' fields.
3. Capacity development of extension personnel and farmers to update their knowledge and skills on modern agricultural technologies.
4. To work as the knowledge and resource centres of agricultural technologies of the districts.
5. Provide farm advisories using Information Communication Technologies (ICTs) and other forms of media (electronic and print media) on varied subjects of interest to farmers. In addition, KVKs produce quality technological products, (seed, planting material, bio-agents, livestock, *etc*) and make them available to farmers, to organize frontline extension activities, identify and document selected farm innovations and to converge with ongoing schemes and programs within the mandate of KVK.

Major schemes operating through KVKs for rural development

- Cluster frontline demonstrations on pulses and oilseeds.
- National Innovations on Climate Resilient Agriculture (NICRA).
- Tribal Sub Plan
- Seed Hubs for pulses
- Attracting and Retaining Rural youth in Agriculture (ARYA)
- Skill Development and Vocational training courses
- E- extension services - advisory services on farmers cell phone, mobile apps development in regional language, *Annapurna Krishi Prasar Sewa*, *etc*.
- Important Government schemes and Programmes in convergence with allied departments are Soil Health Card Scheme, National Food Security Mission, National Mission for Sustainable Agriculture, *Rashtriya Krishi Vikas Yojana*, *Pradhanmantri Krishi Sinchai Yojana*, *Pradhanmantri Fasal Bhima Yojana*, *Krishi Kalyan Abhiyaan, Grameen Krishi Mausam Sewa,* National Agriculture Market (e-NAM), Micro Irrigation Fund, Agriculture Contingency Plan, Rainfed Area Development Programme (RADP), National Watershed Development Project, *etc*.

Impact through teaching

• Development of trained staff for various government departments

The personnel of various State Govt. departments such as Dept. of Agriculture, Dept. of Horticulture, Dept. of Animal Husbandry and Dept. of irrigation are agricultural/ agricultural engineering/ horticulture graduates with a bachelor's degree and are competent to deliver services at the villages.

• Foreign Students from developing countries

Few SAUs are enrolling foreign students from countries such as Afghanistan, Nigeria, Kenya, Bangladesh, Tanzania, Nepal to impart quality agricultural education.

Impact through research

• Regional Agricultural Research Stations

Many of the SAUs have Regional Agricultural Research Stations and Agricultural Research Stations in various agro-climatic zones and remote areas of their states to conduct need-based and location-specific research in various crops. These regional stations have impact in strengthening of research-extension-farmer linkages.

• Breeder and foundation seed production

Many of the SAUs are actively involved in breeder seed and foundation seed production in their research stations and KVKs farms.

• Millets production

Along with major cereal crops, many SAUs are conducting research on increased millets production in their respective states.

Impact through extension

• Technical information dissemination

Through the field extension scientists of KVKs and extension

specialists of RARSs, technologies transfer is quick and also effective. These scientists also form a linkage between research scientists and extension personnel of Department of Agriculture. Also, the extension scientists are instrumental in identifying gaps for effective transfer of technologies.

• Development of infrastructure for extension

Many SAUs have developed infrastructure including buildings and hostels for training field extension personnel, farmers and rural youth. The four Extension Education Institutes (EEIs) of India, which provide in-service training to the staff of line departments, are under administrative control of SAUs, for example, EEI, Hyderabad is under administrative control of Professor Jayasankar Telangana State University, Hyderabad.

• Tribal areas development

Few SAUs have contributed significantly in tribal areas development by conducting research experiments and disseminating technical information to tribal farmers through research stations and KVKs.

Strategic approaches of acharya n.g. ranga agricultural university, sau of andhra pradesh state towards rural development

Acharya N.G. Ranga Agricultural University (ANGRAU) was formed under the name of Andhra Pradesh Agricultural University (APAU) on the 12th of June 1964 through the APAU Act. 1963. Later, it was renamed as Acharya N.G. Ranga Agricultural University on the 7th of November, 1996. With a total scientific strength of 621, the University is serving the farmers of 13 districts of Andhra Pradesh in six agro-climatic zones. The major activities of ANGRAU are as follows:

Food and nutritional security

Implementing State and Central Govt. schemes through KVKs, promotion of balanced diets, promotion of millets, high value processed foods, Farming Systems for Nutrition model implementation, promoting nutrition sensitive agriculture, *etc*.

• Technology and innovations

Low-cost high-yielding sustainable varieties (424 varieties/ hybrids) in various crops, location specific varieties, pest and disease resistant varieties, seed production of improved seed varieties, Farm mechanization, weather forecast, e- agriculture and e- extension, Market Intelligence, Cost of Cultivation scheme, NICRA implementation, ARYA project implementation, Water Management Techniques, Post-Harvest Technology, Nano- technology in agriculture, frontier sciences research, drudgery reduction implements, etc.In addition, innovative extension methods *viz.,* flag method, developing farmer master trainers, innovative farmers networking, farm science clubs, tribal youth networking, Reach Every Panchayat, Kala Jatha, pocket cards for farmers, *Annapurna Krishi Prasara Sevas*-An Alternative ICT Model, Farm Radio and various mobile apps developed by ANGRAU are available for technical information dissemination.

• Mega rice variety BPT 5204

Dr. M.V. Reddy, Principal Scientist and Rice Breeder working at ANGRAU has evolved the famous rice variety 'BPT 5204' popularly known as Samba Masuri in 1986 and today it is grown in over 40 countries. The variety is evolved by crossing Masuri (a malaysian variety), TN-1 and GEB-1.

• Seed production programme

The University increasedits seed production programmes at various research centres with the objective of achieving 100 per cent seed replacement rate in major crops of Andhra Pradesh state. During the year 2018-19, a total of 11,479 q of breeder seed and 7095 q of foundation seed of various crops was produced and supplied to various organizations.

• Capacity building and income generation

Value Chain development, vocational trainings, small scale enterprisespromotion, incubation of start-ups, ARYA and MAYA implementation, Tribal Sub Plan implementation, Innovative Farmer Network with innovative farmers, soil health cards to farmers through KVKs, *etc*.

• Education and literacy

Open and Distance Education through Open and Distance Learning Centre (ODLC); Polytechnics in agriculture, agricultural engineering and organic farming; Vocational Trainings through KVKs; inter-district and inter-state exposure visits; Annual Kisan Melas, dissemination of information through Print and Electronic media. Furthermore, ANGRAU is organizing agricarnivals every year to its students with the objective of inculcating inquisitiveness, innovativeness and leadership skills in students.

• Gender mainstreaming

Creating awareness on drudgery reduction implements/tools and methods for farm women, health and nutrition programmes for rural families, training and capacity building of women farmers, anganwadi workers, facilitating strengthening of SHGs, encouraging agripreneurship among women, *etc*.

• Community science (Formerly Home Science) faculty activities

The College of CommunityScience operates four counselling centers namely Diet Counselling Center, Child Guidance and Family Counseling Center (ALAMBANA), Interior Design Solutions, Consumer Guidance and Counselling Center. The Faculty of Community Science works in coordination and collaboration with various line departments *viz.,* Department of Women Development and Child Welfare, Department of Health, Department of Disabled welfare, Department of Education, Department of Agriculture, Department of Rural Development, *etc*. Around 100 recipes of millet based snacks were standardized and disseminatedthrough publishing in daily newspapers and weekly magazines.

• Agricultural engineering and technology faculty activities

Sub-surface drainage for reclamation, shallow depth quality

water harvesting systems, (improved doruvu technology), direct sowing of paddy, rotational irrigation (AWD) in rice, mechanized system of rice intensification (MSRI), micro-irrigation systems for different crops, hydraulically efficient and low cost semi-permanent sprinkler irrigation designs, subsurface and controlled irrigation systems, more drainage with soil oxygenation under waterlogged conditions, development of plastic components for centrifugal pump, modified broad crested weirs for use in open channels, etc agro techniques have created major impact on agricultural productivity in Andhra Pradesh state. Farm pond technology developed for dry land areas is a boon to the farmers to enhance the yield of groundnut by 20% to 30%. Farm machinery developed by the ANGRAU *viz.* Aqua seed drill, tractor drawn seed-cum-ferti drill, Anantha planter, tractor drawn planter cum boom sprayer, 4-row automatic groundnut planter, Vishnu puddler, matching implements for low HP four wheel tractor (15 HP), a tractor drawn puddler for rice, four-row wheel power weeder for System of Rice Intensification (SRI), Semi-Dry and AWD are popular among the farmers. The University have established eight centers in the state to popularize Mechanized SRI (MSRI). The university established two custom hiring centres to facilitate the mechanization in crops such as groundnut. The University has also introduced sugarcane transplanter under System of Sugarcane Intensification.

• Convergence and linkages

ANGRAU has functional MoUs with M.S. Swaminathan Research Foundation (MSSRF), Chennai, Society for Elimination of Rural Poverty (SERP), A.P. Rural Inclusive Growth Project (APRIGP), Reliance Foundation, Dept. of Agriculture, Dept. of Horticulture, Dept. of Animal Husbandry, ICDS and other line Dept's for implementation of various agricultural projects. ANGRAU scientists (as Governing Board and Management Committee Members) participate in preparation of Strategic Research and Extension Plan (SREP) facilitated by Agricultural Technology Management Agency (ATMA), a district level institution.

• External projects

ANGRAUis implementing Institutional development Plan (IDP) of NAHEP, a World Bank funded project; Annapurna Krishi Prasar Sewa of Digital Media Lab, Asia and Biotech Kisan Hub Project of Dept. of Biotechnology, *etc*.

• DAATTCs

District Agricultural Advisory and Technology Transfer Centres (DAATTCs),unique extension centres of Andhra Pradeshwere established in 1998 and have been functioning from KVK premises since 2017. DAATTC scientists (agronomy, plant protection and agricultural extension) prepare action plans based on resources of the district, conduct field trials, conduct extensive diagnostic visits to farmers' fields for pest and disease identification, diagnosis and to organize training for farmers and extension personnel.

• Rural agricultural work experience programme (RAWEP)

ANGRAU is the first SAU in India which has started RAWEP programme as a part of the curriculum for the final year students of B.Sc (Ag) students to impart practical oriented training in agriculture.

• Farmer's call centre (FCC)

ANGRAU is the first SAU in India which started Farmer's Call Centre as ICT enabled extension method.LandlineToll-free number (1800 425 0430) connects the farmers and scientists via telephone on a daily basis. Scientists at FCC respond to farmer's queries and provide answers in real-time. Farmers receive relevant first-hand information free of cost. Extension-Farmer- Scientist linkage is strengthened through FCC.

• Support to All India Radio, electronic media and print media

ANGRAU identifies and deputes scientists for various programmes of AIR and phone-in-live programmes of Television *(Doordarshan*). Scientists of ANGRAU attend Phone-in-live programmes of Radio and Television and scientists publishes agro-advisories on a weekly basis through print media *i.e.* daily newspapers. ANGRAU has a monthly farm magazine (Vernacular language Telugu) Vyavasayam which publishes latest articles in Agriculture and Allied sectors. ANGRAU also publishes Farmers Alamanac (*Vyavasaya Panchangam*) in Telugu every year including package of practices of major crops.

• Dissemination of farm information through Social Media

ANGRAU has an official youtube channel - electronicwing angrau, Guntur and all the KVKs under ANGRAU have twitter accounts and official websites. All the KVKs and RARSs have Whatsapp professional groups for dissemination of latest information to farmers.

Limitations of saus in overall rural development

• The scientific staff of SAUs are isolated from each other. There is little opportunity for scientist to scientist communication across various states or even among universities within the same state. Many of the scientists have the tendency to receive all their undergraduate, post graduate and Ph.D. training at the University at which they currently are employed. Also, interdisciplinary research among the scientists of the various SAUs is lacking.

• Many KVKs under administrative control of SAUs have no manpower for the veterinary/animal husbandry discipline, thus, impeding transfer of technology in this specialization.Infrastructure development in KVKs is also need of the hour.

• Farmers data base and gender disaggregated data are not available with most of the KVKs.

• Only field level extension scientists are in direct contact with farmers.

• Research Studies conducted by field extension scientists are very few. Hence, farmers' needs are not analyzed and reported to research scientists.
• Impact of extension services delivery by SAUs is studied by only few SAUs.

The way forward for saus for strategic rural development

• At present, SAUs are adopting few villages every three years and focusing on transfer of technology in agricultural and allied sciences. Furthermore, SAUs can also assist to convert the adopted villages into *smart villages* by focusing on integrated rural development and thus, increasing standard of living of the rural population.
• SAUs should inculcate agripreneurship among rural population by nurturing the new ideas in agri-incubation centres.
• Gender mainstreaming should be given priority because women constitute 70 per cent of the rural population.
•SAUs should engage more directly and more effectively in rural development in partnership with line departments and Non-Government Organizations.

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