

## Chapter 6: Agricultural Research and Extension

### I. Agricultural Research

In Andhra Pradesh, in addition to the State Agricultural University (Acharya N. G. Ranga Agricultural University ANGRAU), institutions of Indian Council of Agricultural Research (ICAR), International Crop Research Institute for Semi-Arid Tropics (ICRISAT) and various other institutions are involved in agricultural research. However, the main responsibility for generating agricultural technologies for the state rests with ANGRAU, which has a wide network of 66 Research Stations in the 7 agro-climatic zones of the state. ANGRAU played an important role in developing rice varieties in the past, and thereby contributed to the emergence of Andhra Pradesh as a major rice producer. As much as 95 per cent of the research is carried on in public sector, while some research is done in the private sector also, particularly by companies producing seeds, agro-chemicals, implements and machinery, etc.

The University's mandate is to strive constantly to generate technologies for improving the production of crops, livestock and in other sectors. As part of this, the University has to generate improved varieties and hybrids, location specific technologies, seeds (breeder and foundation), planting material, bio-agents agronomic practices, water management techniques, plant protection measures, etc. However, not many improved varieties have been released in the major crops which have greater impact in larger areas in the state. Adoption by farmers has been significant mainly in the case of rice varieties. In case of other varieties, the University's performance has been much less successful. The production and distribution of planting material and bio-agents is less than expected, and other technologies pertaining to water management and plant protection have not been adequately developed. There has also been inadequate focus on rainfed agriculture.

The University needs to engage in research that would assist in responding to the challenges of a globalised market economy, such as the problems posed by the WTO regime, and in dealing with agrarian crisis in the state. A WTO cell was constituted by the University in 2001, but thus far little work has been reported. In general, socio-economic research appears to be relatively neglected.

It is true that the funds allocated to the University are inadequate considering the size of the state, the number of scientists and administrative staff and the assigned tasks of teaching, research and extension. The funds provided to the University amount to less than 0.4 per cent of the GDP from agriculture in the state, or only Rs. 152 per acre cultivated in the state. About 50 per cent of this amount is allocated for research purposes, which is low in relation to the desired research programmes, and so research efficiency is hampered on account of the insufficient operational expenses. As a result, a large number of posts of scientific personnel have been kept vacant for several years. Basic infrastructure, such as water, power, equipment, lab facilities, implements and machinery, storage and processing facilities etc. is not available fully for carrying out the research in a productive and efficient manner in almost all the research centres.

## **II. Agricultural extension services**

The collapse of public agricultural extension services in the state has been one of the most important contributory factors to the generalised agrarian crisis. The lack of sufficient field level staff and the apparent absence of systematic dissemination of important information regarding appropriate cropping patterns, seeds and other inputs, cultivation practices and so on, meant that input dealers effectively became the most important source of such information to farmers. But private input dealers have a basic conflict of interest when it comes to agricultural extension, because they will be concerned mainly with selling more of their stocks. There are many reports of input dealers providing their otherwise unsold and inferior quality inputs along with their suggestions to the farmers. This in turn has led to inefficiencies in input use, such that Andhra Pradesh has the highest consumption of pesticides per unit of output and the second highest consumption of fertilisers, among all the states in India. As has been noted earlier in Chapter 7, farmers are often not aware of the correct types and dosages required for particular agro-chemicals for different crops. There are numerous reports of inappropriate use, such as applying pesticides for crop diseases, using both fungicides and pesticides for application to crops, and mixing up two or three kinds of pesticides for application. As a result of the excessive and indiscriminate use of agro-chemicals, soil qualities deteriorate and pests develop resistance.

The technical knowledge, competence, and communication skills of the extension staff need to be developed. Information about correct input use and credit, marketing and insurance is not reaching the farmers through extension services. Further, training in the necessary technologies for water and watershed management, dryland agriculture and soil management is also inadequate. There are complaints that the extension personnel do not visit the farms to provide technical advice, and have little contact with farmers. Further, there appears to be a bias in the extension services against small farmers and women farmers.

The situation worsened in the previous decade, when vacancies of extension officers were left unfilled and input provision was mostly left to the unregulated private sector. In the mid-1990s, public expenditure on agricultural extension in Andhra Pradesh amounted to only 0.02 per cent of the GDP from agriculture in the state, compared to 0.15 per cent for the all-India average. One of the most important constraints in the extension system is therefore lack of finance. It is reported that only around 30 per cent of the new technologies generated are covered through extension services, and less than 20 per cent of farmers.

Andhra Pradesh has far fewer extension workers than states at comparable levels of agricultural development. In states like Maharashtra and West Bengal, Agricultural Extension Officers are provided for every 1-2 villages or 3-4 villages and in Karnataka they are provided so as to cover 800 to 1200 farm families. However, in Andhra Pradesh, an AEO has to cover 10-15 villages or more than 3700 farm families. This is clearly unmanageable. Often AEOs are not abreast of the latest developments in cultivation practices and therefore cannot inform farmers about them. Further, it has been brought to the notice of the Commission that agricultural staff is deployed for various other duties even during the peak season, such as procurement operations for paddy and maize, DWMA (Land Development activities), supervision of examinations, pulse polio campaigns, VELUGU, enumeration work, family planning work, supervision under BPL survey, marketing duty, DRDA gram sabhas etc. These obviously affect the extension work of the field staff. The Divisional Assistant Directors of Agriculture presently operate without adequate facilities such as telephone, cell phone, internet access, etc..

There is a formal linkage of agricultural extension in the Department with Agricultural University through bimonthly workshops and Zonal Research Extension Advisory Council meetings. In addition to the above, diagnostic teams with the Scientists of ANGRAU and

officers of the Department at District level are constituted crop-wise for major crops to identify problems encountered in crop production and to provide solutions on the spot. Similarly, crop escort teams are formed to give timely advise on inputs, crop production and crop protection aspects. These linkages need to be strengthened, with regular reviews of their functioning.

### **III. Recommendations:**

#### **For agricultural research:**

- 1. Public sector research should be intensified, as it alone provides benefits to the farmers without any profit motive.** In order to strengthen research in the University, a lump sum grant of Rs. 30 crores may be provided to the University for improving the infrastructure and filling staff positions in the University and all the 66 research stations of the University. The Government may obtain a defined proposal in this regard from the University. In addition, the budgetary provision for agricultural research will have to be enhanced significantly.
2. The mandate of the University should be changed to “to identify and generate technologies, which would assure livelihood security to the people dependent on agriculture”. Relevant and appropriate technologies have to be identified to suit the needs of farming situation and economic status of the peasantry in the State for the purpose of ensuring them livelihood security.
3. The state government must actively take up the challenges posed by the WTO regime and prepare local farmers to meet these challenges in future. The WTO Cell in ANGRAU should be shifted to the Department of Agriculture, and it must immediately focus on identifying “sensitive products”, considering the market intelligence and other possibilities for particular crops, emphasising means of reducing costs and improving productivity, and devising means of protection of farmers who are exposed to competition from highly subsidised production abroad.

4. Steps are needed to strengthen social sciences in the University, especially through networking with social science departments and research institutions.

5. The syllabus should include training in management skills which would allow the University graduates to be usefully employed, for example in agribusinesses and agri-clinics.

6. A dependable mechanism has to be developed for getting feedback from farmers on the merits and demerits of technologies generated. Research Stations of the University could take up a village adoption programme to demonstrate all the latest technologies to the farmers.

**7. Some important research gaps need to be filled. Dry land agriculture should be given priority in the research programme. To further this, some of the research centres of the University may be converted into dry land research centres. The following areas of research require priority:**

- **Water and watershed management,**
- **Land use planning**
- **Organic farming techniques, including bio-fertilisers and Integrated Pest Management**
- **Diversification, including increased emphasis on region-specific sustainable crops and practices. This would include drought-resistant crops and varieties, horticulture crops, animal husbandry and pre- and post- handling of produce**
- **Biotechnological research and development of transgenic varieties.**

8. Hybrid varieties are not adequately focussed upon. The following specific measures may be considered for hybrid seed development:

- Parent lines in small parts may be directly supplied to the farmers for hybrid seed production at their level for self use.
- Priority may be given for parent line supply to the 'Seed Village Production Programme' to ensure University hybrid seed availability for local use by the farmers.

**For agricultural extension:**

**The highest priority must be accorded to strengthening the public extension services.** To this end, the following should be undertaken:

1. There must be a substantial increase in staff devoted to agricultural extension. The first requirement is to increase the number of AEOs. While the current number of available AEOs posts is 2811, the actual requirement may be calculated as follows:

- 1 AEO per 1000 farm families = 10603 AEOs
- 1 AEO per 1000 hectares = 10523 AEOs
- 1 AEO per 3 villages = 8862 AEOs

The cost for these 3 alternatives works out to approximately Rs. 53 to 63 crores per annum.

In addition, there are currently 254 Assistant Directors of Agriculture in each division, which covers 4 to 5 mandals. It is suggested that a uniform pattern of 4 mandals per Assistant Director of Agriculture division is adopted, which would mean 277 Assistant Directors of Agriculture division i.e. 23 more than at present, at an additional cost of Rs. 80 lakh per year.

2. Agricultural extension staff must concentrate only on agricultural extension work, and they should not be diverted to various other activities from time to time.

3. The training of extension workers must be a continuous process . The three in-service training centres currently have the capacity to train only 90 participants per year, their capacity should be increased. Refresher courses should be organised to ensure that each AEO gets such training at least once every three years. The capacity of the district Farmers Training Centres also needs to be increased. The State Agricultural Management Extension Training Institute (SAMETI) as well as other Government of India training institutes, such as National Institute of Agricultural Extension Management (MANAGE), the National Institute for Agricultural Research and Management and the National Institute for Rural Development, should be utilised to the maximum extent. The linkages of flow of information between the departmental staff and the Agricultural University also should be increased.

4. To make the field staff more effective and mobile it is necessary to provide them with vehicles for making frequent field visits. It is suggested that the following must be provided.

- Housing to field officers in villages, along with strict enforcement of local residence
- Vehicles, including mopeds and vans, and mobile phones in order to improve the functioning of extension staff and making it easier to respond quickly to local demands.

5. Community involvement in the process of agricultural extension is crucial for its success. The Rythu Mitra Groups can be mobilised more effectively for identifying local problems and disseminating information amongst farmers. Some of them were already doing good work, and this should be extended. Also, where NGOs are active in developing and spreading useful technologies and cultivation practices, they should also be integrated into the process of extension.