

The Concept of Agricultural Universities*

by

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Synopsis: The concept of the Agricultural University with the objective of re-examining the existing pattern of the organisations serving agriculture and for establishing much closer inter-relationship between Research, Teaching and Extension programs is developed in this article.

The highest level and greatest efficiency in agricultural production in this country, as indeed in any other country, can be achieved only through the application of modern scientific principles to the practices employed in crop and livestock production and in soil and water management. The development of the agricultural colleges, agricultural experiment stations, and extension organizations has this as its major objectives.

The key to success in such a program is an intelligent, well trained and imaginative corps of scientists dedicated to the ideals of service. It requires a progressive research organization with its activities focused closely on the problems of the cultivators which limit increased productivity. This in turn must be closely linked, on the one hand with the program of training students so that the advances in agricultural science are rapidly incorporated into their program of instruction and on the other hand, with an extension service which carries these improvements to the cultivator and in turn keeps the research workers in touch with the problems of the cultivator.

The urgency of bringing about a rapid increase in food production in this country necessitates a re-examination of the existing pattern with the aim of bringing about the greatest possible efficiency and effectiveness of the organizations serving agriculture. It is apparent that there is a need for establishing much closer inter-relationships between research, teaching and extension programs. It is with these aims in view that the concept of the Agricultural University has been developed.

The Origin of the Proposal: The establishment of Rural Universities was originally suggested by the University Commission under the Chairmanship of Dr. S. Radhakrishnan, which visualized a Rural University as a "ring of small, resident under-graduate colleges with specialised and University facilities in the Center". The joint Indo-American Team on Agricultural Research and Education set up by the Ministry of Food and

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* Received on 20-5-1965.

Agriculture in 1954 further clarified this recommendation and made practical suggestions for its implementation. The Team recommended as a first step, the setting up of a nucleus comprising a college of agricultural and a college of veterinary science to which, in due course, could be added a college of home science and a college of agricultural engineering and technology. The Second Joint Indo-American Team set up by the same Ministry in 1959 noted the widespread demand from many States for the establishment of agricultural universities, and while supporting this development it cautioned that assistance to establish such universities should be granted only when there is adherence to the basic principles such as (i) autonomous status, (ii) location of agricultural, veterinary, animal husbandry, home science, technological and science colleges on the same campus, (iii) integration of teaching by offering courses in any of these institutions to provide a composite course and (iv) integration of education, research and extension. The implementation of the second provision above must obviously take account of the present institutions existing in a given State.

Dean H. W. Hannah of the University of Illinois; on request of the Government developed a statement called "A Blueprint for an Agricultural University" which served as a basis for developing the legislation creating the U. P. Agricultural University during the Second Plan Period. Several additional states have come forward with proposals for such universities during the Third Plan Period.

Distinguishing Features of the Agricultural University: The features which distinguish this university from the traditional university are as follows:—

1. It recognizes a direct responsibility and responsiveness to the needs of cultivators in contrast with being only a seat of learning and scholarship, and assumes a primary responsibility for economic development and improvement of the status of the people of the State.

2. In addition to resident teaching for degree candidates, the staff also have responsibility for applied as well as fundamental research in agriculture throughout the State. Such research goes beyond the laboratory and into the fields and homes and with the livestock under varying conditions found in different parts of the State.

3. The chief medium through which the cultivators are to derive the benefits of the training programs and of the research work under the agricultural university, is the extension service of the university, which should be fully integrated with teaching and research organizations so that

a smooth and effective flow of the results of research and of the training programs to the cultivators may be possible and the problems of the cultivators may similarly be transmitted back to the teaching and training centres for being tackled promptly and effectively.

4. The territory of the university should extend to the entire State in keeping with the above principles and responsibilities.

5. The curricula and training programs should be modelled in a manner as to be in keeping with the needs of the States on the one hand and with the aptitudes and needs of the individual students or trainees on the other. This must involve the formulation of a flexible curriculum with suitable provisions for courses of instruction in a wide field and the appointment of teachers who have specialized in their respective disciplines.

Needs of Agricultural Training Unique: The agricultural sector has a number of distinctive features which differ from other sectors of the economy and justify a different type of treatment from that of other branches of learning and which it is difficult to meet through the traditional university pattern. Approximately 70 per cent of the population of the country is dependent upon agriculture for its livelihood and in fact other segments of the economy cannot develop unless the requirements for food and agricultural products are met. Production is achieved through the medium of a large number of individual farming units, none of which have the resources available for carrying out investigations necessary to solve the problems limiting production, which in turn are common to large numbers of individual units. At the same time these problems are complex and their solution is of such concern to the total national community that a collective action is essential. Covering a large number of fields of related science, agriculture can develop to the extent necessary only when research in these fields is oriented to the changing problems of the cultivator with due orientation to local conditions and the results therefrom are effectively utilized in the training programs and in the extension services. All these transcend the scope and the functions of the traditional universities on the one hand and of the established administrative departments of government on the other.

Present Position: The need for research, the training of agricultural graduates, and extension programs with the cultivators has been recognized in this country for sometime past. Resources for carrying out these respective programs, however, have been developed somewhat independently. The universities have handled the training of agricultural graduates and the departments of agriculture and community development have developed the programs of research and extension activities. While these have maintained

some liaison one with another, the relationship has not been close enough to ensure maximum transfer of information and practices from one to the other. At present there are approximately 50 agricultural colleges, and 17 veterinary colleges in the country. These are either under State management or in the case of some of the agricultural colleges under private management. Divorced as they are from experiment stations and extension organizations, the agricultural training programs under the universities have found it difficult to adjust their training programs to keep pace with rapid developments in modern science. It has been the unanimous view of several independent bodies that unless and until the programs of agricultural research and education are overhauled and reoriented, it would not be possible to meet the real needs of the cultivators and to attain the country's goals for the considerable increases in agricultural production. Trained agricultural graduates from the universities represent the key personnel through whom the sum total gained through research and working in the fields has to be utilized for effecting a significant increase in agricultural production.

In general at present the agricultural and veterinary colleges are affiliated to autonomous universities of the traditional type. The curricula of these are controlled by the universities concerned and they have tended to retain considerable rigidity of syllabi with only very slow change in their main structure or scope. The states maintain a number of agricultural experiment centres, livestock farms, poultry farms, key village centres and various other service units. Some of these centres consist of several different units operating somewhat independently. The extension officers have educational responsibilities but at the same time are charged with extensive duties concerning the supply of seeds, fertilizers, insecticides and fungicides, supply of seedlings, and nursery plants, plant protection work and various other duties, to the extent that the educational functions are of necessity somewhat limited.

Adjustments in the pattern for these services is needed with a view of seeking ways by which these resources and additional funds devoted to agricultural improvement can yield maximum return. It will appear that agricultural university offers a means for very greatly increasing this effectiveness.

The Agricultural University Committee, appointed by the Government of India on recommendation of the Indian Council of Agricultural Education, have made the following suggestions with respect to the university structure :

1. The University should be State-wide in responsibility for university work in agriculture as broadly defined, including animal science and home science.

2. The agricultural university should include at least colleges of agriculture, veterinary and animal science, home science, agricultural engineering technology and a school of basic sciences and humanities and to the extent possible, these should be located on the same campus. Existing institutions, however, cannot easily be abandoned and this must be taken into account.

3. All colleges of the university should be *constituent colleges* of the university under the same Board of Management, same chief administrative officers, and with fully integrated faculty and curricula. This is to be distinguished clearly from affiliation.

4. All other State supported colleges of agriculture and veterinary and animal science which may be established in the State would come within and as *constituent parts* of the university.

5. Research and extension programs (educational phase) in agriculture, home science, and veterinary and animal science would be fully integrated with the teaching functions through the agricultural university.

6. The agricultural University is an organization devoted to the educational problems of the rural people to develop leadership, increase production, and generally improve the standard of living.

The university administration should serve the technical staff by:—

- (i) relieving them of the non-technical work so that they can devote full time to the problems to be solved ;
- (ii) expediting procurement of needed supplies ;
- (iii) hastening authorization to do the necessary jobs ; and
- (iv) to carry out its functions effectively.

The University should have a simple straight line of authority, and responsibility in its organization.

To accomplish this, the attached flow chart is suggested.

Within each department, the department head would be responsible for, and have staff assigned to teaching, research and extension in his particular subject matter field.

The Dean is the leader of his college staff and is responsible to the Vice-Chancellor but delegates the necessary authority to the subordinate officers for carrying out the program of the college.

The Director of Research is jointly responsible to the Deans of the various colleges for planning and carrying out research in these respective fields to solve the problems of the State. He is responsible for the central research station as well as the outfield research stations and out-field testing and through the department heads for projects conducted by staff of these departments.

The heads of subject matter departments with their staff will plan the research projects and carry them out subject to general control and coordination of the Director of Research. Each staff member doing research will be responsible to the departmental head for the planning, execution and reporting on his research project.

Superintendents of research stations will be responsible to the Director, but will work with and assist each specialist in his project at the research station. The Director of Instruction is responsible to the Dean for the curriculum of his college and for the general standards of training of the students at all levels. The Director of Extension is jointly responsible to the Deans of the various colleges for developing programs in these respective fields for assisting the farmers and home makers in applying science to their problems. He will work with the Directors of Research and Instruction in carrying out these responsibilities.

For the smooth operation of the extension organization, the State might be divided into a few areas (perhaps four or five) of about equal size. For each of these an extension supervisor, responsible to the Director would be appointed. His responsibility would be to assist the district and block extension specialists in their work, coordinate programs, report work of other block extension specialists, report new information, learn about problems needing research, and otherwise keep his block specialists and the Directors informed about his area work and problems.

The block extension specialists would secure service of specialized personnel when needed, work with the farmers in planning their production programs, assist in developing organizations, advise with service and supply organizations, co-operate with the village level workers, assist in planning and conducting demonstrations, help in organizing field visits to the research stations, and be responsible for carrying to the blocks the latest improvements in agricultural science coming from the research programs.

Agricultural Research: It is suggested that all research activities in agriculture and animal and veterinary sciences be the responsibility of the Agricultural University and under the direction and supervision of the

Director of Research. The purpose of research is to find new facts to solve the problems of production, marketing, and consumption of farm and home and in related industries. These facts are also used in the classroom to train students in short courses to train farmers and home makers, and in extension educational programs. To this end the following is recommended :

1. All Agricultural Research Stations and Research Schemes in agricultural and animal science should be a part of the Agricultural University under the responsibility and guidance of the Director of Research.

2. Research Schemes in Agriculture and Animal Science sponsored by the ICAR and those carried out by the State under the sponsorship of Central Commodity Committees, or other agencies would be arranged in the State through the Agricultural Research Director of the Agricultural University.

3. In the Livestock field those principal stations which will be developing research would become a part of the University under the Director of Research and would include those livestock farms attached directly to the institutions where veterinary colleges are located and in addition Regional Livestock Farms suitable for development of research programs in this field.

4. Deputy or Assistant Directors of Research, for general administration and for field station management would be provided as required to assist the Director of Research.

5. The policy would be declared that future development would be in the direction of consolidation of research into a small number of field stations. Initially it is suggested that selected field stations be upgraded into regional centers.

6. New projects and schemes would be developed in general at the main central station or one of the regional sub-centers where possible. As present projects at the smaller stations are completed these stations would in general be discontinued as research stations unless some special need exists with a specialized commodity or an environmental condition which cannot be duplicated at the main station or main sub-stations. Extension from these main centers in sub-environments may be developed when required but usually on a temporary basis.

In recommending upgrading a few well selected and strategically located sub-stations it is the judgement of the Committee that this would result in much more effective use of resources and would help in providing research facilities and stimuli for continued productivity. Research scientists

need stimulation of association with other scientists in their own and related fields. The development of team work projects bringing together on individual commodities scientists in different fields such as soil management, plant breeding, plant pathology, entomology etc., encourage a more balanced approach to the solution of problems limiting production since improved production usually requires simultaneous improvement in several practices. By bringing several projects together at a few principal stations, it would be possible to provide a better balanced team in the various scientific fields such as agronomy, soil management, plant breeding, plant pathology, entomology, chemistry, etc., than is possible where individual projects are isolated in separate locations. It is not feasible or practical to duplicate the library facilities so essential for research scientists nor supporting laboratory facilities at a large number of places but these can be provided at a few regional stations where a community of scientists can work together. These can also arrange co-operating lending or microfilm service through the central library at the headquarters campus. Relatively simple organizations and facilities can be developed temporarily or otherwise for testing of the findings of these main stations in other environments. In such small testing stations a single investigator can be responsible for several experiments with a single or with several crops.

Extension Service: The Agricultural University should have the responsibility for extension functions which are primarily educational in character. It is not anticipated that the University would assume responsibility for equipment, supplies of fertilizers, seeds, insecticides, drugs, vaccines, sera, animal breeding stock, and other supplies and services which are presently combined with the functions of the extension officers in the Departments of Agriculture and Animal Husbandry. Although it may be desirable for the extension service to have the responsibility for work at the village level at sometime in the future, it is not considered feasible initially to include under University direction the village level workers which are provided through the community development program. The extension training centers for training village level workers are required to be brought into close working relationship with agricultural universities as soon as possible. Maintenance of a very close liaison between these training centers and the agricultural extension specialists of the university would help in the effective utilization of the new elements of technology in the block extension program.

On the Central Campus it is anticipated that there would be Director of Extension who would be responsible to the Dean of Agriculture. Further there would be Department of Extension Education which would assume the responsibilities for training in extension methods including training of

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instructors for the extension training centers as envisaged by the Extension Training Institute, recently authorized. Information officers and publications office would be provided at the University. Each of the major technical departments of the College would have extension specialist (s) as members of the staff, responsible on a technical subject matter basis to the Head of the Department but responsible to the Director of Extension for schedules and general field activities. The training of the specialized staff for the Intensive District Program (Package Program) would likewise be the responsibility of the University through its extension service and department of extension education.

The State could be divided into a few areas of about equal size. For each of these an extension supervisor responsible to the Director would be required. His responsibility will be to assist the block extension specialists, report new information, learn about problems needing research, and otherwise keep the block extension specialists and the Director informed about his area work and problems. Where possible, these area supervisors should have their headquarters located at the principal research stations.

Each block would be assigned one or more agricultural extension specialists, a livestock extension specialist, and a home science specialist to provide technical guidance in the block staff in these fields. The block extension specialists would secure services of specialized personnel when needed, work with farmers and block staff in planning their production program, assist in developing organizations, advise with service and supply organizations, co-operate with village level workers in conducting demonstrations, help in organizing field visits to research stations, and be responsible for carrying to the block the latest improvements in agricultural science coming from the research program.

The Departments of Agriculture and of Animal Husbandry: Departments of Government where legal authority is necessary or where business transactions take place have a very vital and important role. In a developing economy these functions will become more important and of necessity of greater magnitude. Such functions would not, however, seem to be appropriate to an Agricultural University but should be developed in the departments of government. Among these areas of responsibility will be marketing, processing, consumption, regulation, quarantine, services and supplies.

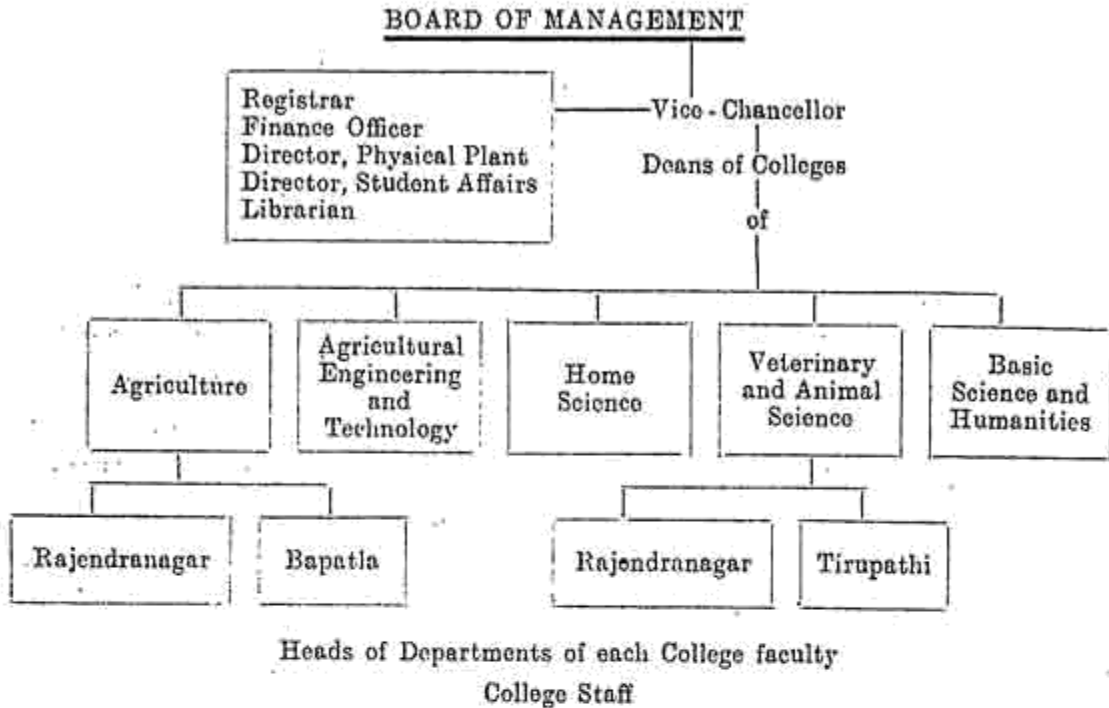
Marketing : Setting and enforcing grades and standards of agricultural commodities, labelling containers, storage facilities, transportation.

- Processing* : Grades and standards, plant sanitation, quality control, additives.
- Consumption* : Product standard and purity of food.
- Regulation* : Weights and measures, seed purity and vegetables, fertilizer grades, formula labels, serums, vaccines, medicines, and drugs for livestock, insecticide standards, labels for using insecticides and fungicides, nursery stock standards.
- Quarantine* : Livestock diseases, plant diseases, insects, eradication work.
- Service* : Vaccination, livestock treatment, spraying for insect and disease control of farm crops and livestock, surveys to determine presence of dangerous population of insects, disease incidence or animal pests, collect and compile agricultural statistics.
- Supplies* : Since there is a limited supply of many necessary items of production, supply at the proper time and amount is vital. Assist farmer cooperative and local agencies in obtaining supplies of seed, pesticides, fertilizer, containers, transportation, equipment, foundation livestock and poultry, nursery stock, seedlings, etc.

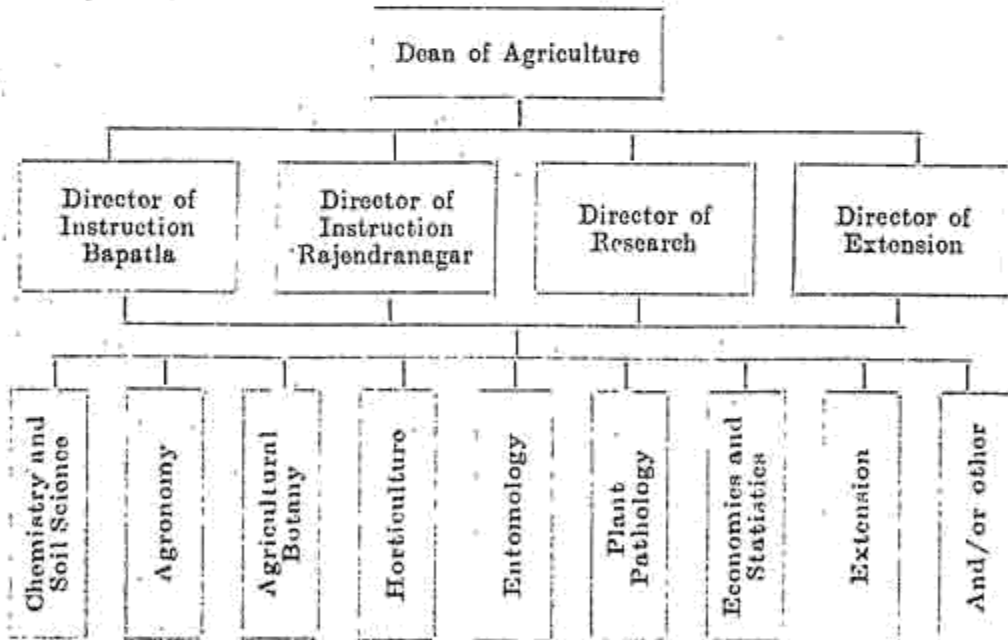
The above suggestions were developed after careful study of the existing organizations and services in the states and with a view toward developing a workable pattern for full integration of the teaching, research and extension services for agriculture, animal science, and home science. It has been the judgement of the Agricultural University Committee that this pattern would provide for an orderly adjustment and would provide a suitable basis for developing more effective services in these fields.

While developing the university on the above lines, the necessity of bringing the supplies, services, and regulatory activities under the Departments of Government along in consonance and harmony with the research and educational activities of the university should be stressed. These various activities mutually reinforce one another and are all essential if maximum progress is to be made in advancing and improving agriculture in the nation.

FLOW CHART:



Within the College of Agriculture, as an example, the organizational chart would be somewhat as follows:



PRINCIPAL EXPERIMENT STATIONS

A. Agricultural:

- Rajendranagar (Headquarters)
- Nizamabad (Western irrigated area—Telangana)
- Nandyal (Black cotton soil area—Rayalaseema)
- Koduru (Fruit Station—Rayalaseema)
- Maruteru (Paddy areas of coast—Circars)
- Anakapalle (Sugarcane Center—Circars)
- Bapatla (College of Agriculture and sandy coastal area—Circars)

B. Livestock:

- Rajendranagar (Headquarters)
- Tirupathi (Veterinary College)
- Vizagapatnam (North-East)
- Guntur-Lam (Central Coastal area)
- Penukonda (Southern)