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International Agricultural Affairs

The College of Agriculture & Home Economics

THE OHIO STATE UNIVERSITY

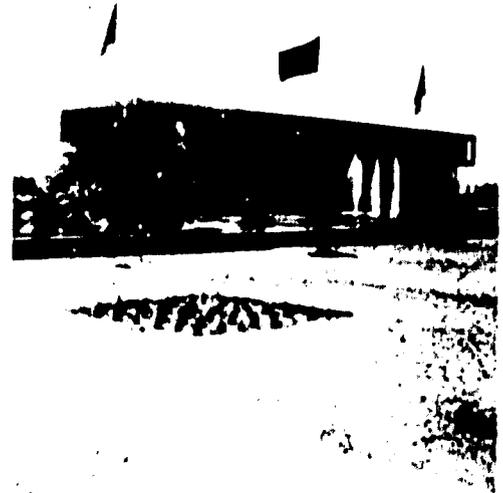
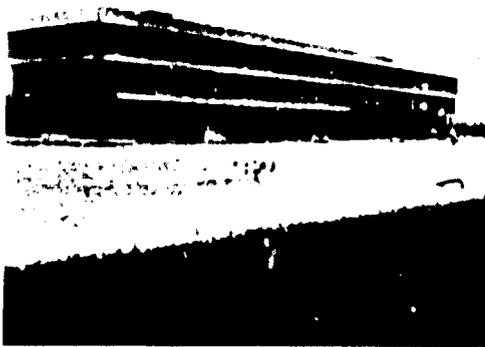
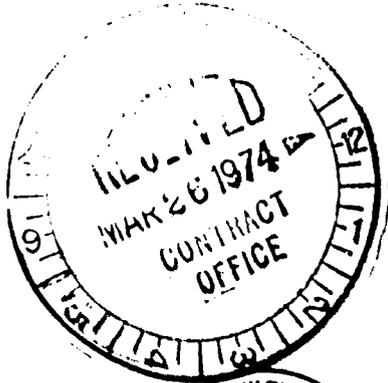
cooperating with

THE PUNJAB AGRICULTURAL UNIVERSITY &
THE HARYANA AGRICULTURAL UNIVERSITY

INDIA

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Terminal Report
Research and Education Programs
1955-1964 and 1964-1973
USAID Contract/Nesa 147

T E R M I N A L R E P O R T

USAID Contract/Nesa-147

November 1, 1964 - June 30, 1973

Program of

THE OHIO STATE UNIVERSITY, COLUMBUS, OHIO, U.S.A.

and the

PUNJAB AGRICULTURAL UNIVERSITY

and

HARYANA AGRICULTURAL UNIVERSITY

**Campuses at Ludhiana, Hissar, Palampur
States of Punjab, Haryana, and Himachal Pradesh**

INDIA

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FOREWORD

This is the final and terminal report on The Ohio State University program with The Punjab Agricultural University and Haryana Agricultural University in Northern India. This report is presented in compliance with the USAID Nesa 147 Contract between the Agency for International Development, The United States of America, and The Ohio State University.

This report covers mainly the period of the AID contract from Nov. 1, 1964 to June 30, 1973. However, the report also covers the preliminary Ohio State University Program from 1955 to 1964 for the Northwest region of India which included the states of Punjab and Haryana.

Annual reports were made on the program as follows:

Nov. 1, 1964 -- Oct. 31, 1965
Nov. 1, 1965 - Oct. 31, 1966
Nov. 1, 1966 - June 30, 1967
July 1, 1967 - June 30, 1968
July 1, 1968 - June 30, 1969
July 1, 1969 - June 30, 1970
July 1, 1970 - June 30, 1971
July 1, 1971 - June 30, 1972

Semi-annual reports were made on the preliminary program from 1955 to 1964. Individual OSU Professors stationed in India at times made monthly and quarterly reports and all of them made terminal reports to the USAID Mission in Delhi, India.

The annual reports for the last four years were quite comprehensive and presented more details on the program, the Punjab Agricultural University, the Haryana Agricultural University, the states where they are located, and evaluation of the program.

In this report it seemed best to use two approaches in evaluating the program: (1) the contributions made toward the development of separate phases or subject matter areas of the universities, and (2) the contribution toward the organization, structure, administration, and overall development of the Universities. Of course the development of each phase or subject matter area probably helped develop the total University, but often it is difficult to determine specifically this relationship. The evaluation is more thorough and complete by using both approaches to the evaluation.

This program, especially the part with the Haryana Agricultural University, was terminated four or five years earlier than had been recommended. The development of the Haryana Agricultural University was at a stage where technical assistance over the next few years would have been most productive. The benefits to both The Punjab Agricultural University and Haryana Agricultural University have been considered by many people to be outstanding.

In this report no attempt has been made to quantify the direct costs and benefits of this program to The Ohio State University. Without doubt there were unreimbursed costs to The Ohio State University by way of disruptions of faculty teaching, research and extension programs. On the other hand many benefits were received, mainly in enlarging the international dimension of the College of Agriculture and Home Economics and some other areas of OSU in respect to the quality of teaching, developmental research, study abroad opportunities, professional breadth of faculty, and world wide understanding. Benefits will continue through linkages between OSU and the Indian Universities, the student exchanges and faculty exchanges. The Ohio State University is better for having conducted this program and the United States was served in its technical assistance program with India.

This program was a multi-party adventure and indications are that all parties benefitted: The Punjab Agricultural University, The Haryana Agricultural University, The Ohio State University, the Government of India, and The United States Government, and above all the people of India. It has offered an opportunity to build sound bridges and valuable linkages between the two governments and between the Ohio State University and Indian Universities.

Cover Photos

top: The Ohio State University Agricultural Administration Building.
lower left: Punjab Agricultural University Administration Building.
lower right: Haryana Agricultural University Administration Building.

I. BACKGROUND

Shortly after India became an independent nation in 1947 her University Education Commission recommended the establishment of rural universities which would have many of the attributes of U. S. Land-Grant Universities. Somewhat later, a project for U. S. assistance to agricultural research, education and extension organization in India was proposed between the Government of India and the Government of the United States. This project, called Operational Agreement No. 28, was signed by representatives of the two governments on April 30, 1954.

As one major phase of the project a Joint Team, consisting of five representatives of the Indian government and three specialists in agricultural education and research from the United States, was selected to:

"Make a comparative study of the organization, functions and working of Indian and American agricultural and research institutions and agricultural colleges and make recommendations, including in particular, as to how the assistance envisaged under various TCM (Technical Cooperation Mission) agreements could be utilized to maximum advantage to remove some of the critical deficiencies in the existing facilities for agricultural research and education in India."

It was also to:

"Suggest methods for coordinating the work of such institutions in India functioning under the Center, the States and the Universities."

The report of the Joint Indo-American Team, as well as the report of the University Education Commission, mentioned above, served as the basis for the development of the inter-institutional program.

In 1955 the Government of India and the U. S. TCM (United States Technical Cooperation Mission in India) arranged for five Land-Grant Universities (Ohio State University, University of Illinois, Kansas State University, University of Tennessee and the University of Missouri) to assist 40 Indian colleges of agriculture and veterinary science and two research institutes. Each of these U. S. Universities was to work with all the colleges and related institutions in a region of two to four states or territories. For this purpose India was divided into five regions with the responsibilities of the five land-grant universities divided as follows:

<u>U. S. LAND-GRANT UNIVERSITIES</u>	<u>REGION</u>	<u>STATES OR TERRITORIES</u>
University of Illinois	I	Uttar Pradesh, Madhya Pradesh
The Ohio State University	II	Punjab, Rajasthan, Pepsu, Himachel Pradesh

University of Missouri	III	Bengal, Orissa, Bihar, Assam
Kansas State University	IV	Maharashtra, Andhra Pradesh
University of Tennessee	V	Mysore, Madras, Kerala

A map of India on which these regions are delineated is presented below. Later in 1966 Pennsylvania State University joined the program in the State of Maharashtra, sharing region IV with Kansas State University.



A. THE STATES OF PUNJAB, HARYANA AND HIMACHAL PRADESH

The boundaries of the Punjab State of India have undergone a number of important changes since the State was divided between India and Pakistan at the time of partition in 1947. In 1955 when The Ohio State University started working in the northwest region of India, Punjab included the Kangra area and Lahaul and Spiti to the north and much of what is now Haryana to the South. The State of Pepsu, with the city of Patiala in the eastern part, was then independent.

In 1957, the Pepsu state dissolved and that area was added to the Punjab. The Punjab state then covered 47,334 square miles, or about 4% of the land area of India. This was the territory served by the Punjab Agricultural University at its founding in 1962. The same area was involved when the OSU/USAID Contract was negotiated for PAU in 1964. It had a campus at Ludhiana, which is the present Punjab State, and a campus at Hissar which is in the present Haryana State. In 1966 it started a campus in the Kangra District to the north at Palampur, which is in the present State of Himachal Pradesh.

Late in 1966, the Punjab State was divided into the present day states and areas. Roughly the southeastern one-third was incorporated as Haryana State, a new political entity. Somewhat smaller areas in the north and north-east were added to Himachal Pradesh. The resulting Punjab was reduced to 19,404 square miles; Haryana now occupies 16,938 square miles, and about 11,000 square miles were added to Himachal Pradesh. One campus of Punjab Agricultural University was then located in each of the three states. This continued until 1970 when the Hissar Campus was separated from PAU and became Haryana Agricultural University, and the Palampur campus was separated and became a part of the Agricultural Complex of Himachal Pradesh University.

The State of Punjab

The State of Punjab lies within latitudes 29° 30' North and longitudes 73°55' to 76°50' East. It forms a part of northwestern India and is land-locked.

The total geographical area of the State is 19,404 square miles or 5.04 million hectares, out of which 4.02 million hectares (about 80 per cent) is the net area in cultivated crops.

The total population of the Punjab is 13.5 millions (based on 1971 census) which is 2.5 per cent of the total population of India. The rural population is 76.9 per cent of the total. The density of population per square kilometer is 268 as against 182 of India. The percentage of literacy is 33.39 as compared with 29.35 for the country as a whole.

The number of land holdings is 724,365 spread over 11,947 villages. Generally the size of the holdings is rather small. About 58.2 per cent of them are smaller than 5 hectares and 16.9 per cent are less than even 2 hectares. About 7.2 per cent of the farms are 12 to 20 hectares each and only 2.9 per cent are above 20 hectares.

The climate of the State is typically subtropical. The maximum temperature during June usually exceeds 40°C, and may occasionally touch 47°C. A minimum temperature of about 1°C is recorded normally during January. The summer season is from April to September and the winter from November to February.

There are two main crop sowing seasons, viz, Rabi from the beginning of October to the end of November and Kharif during June-July. With the introduction of multiple cropping, additional rabi (April-May) and additional kharif (August-September) sowing season are also becoming important. Wheat, the main crop matures by the middle of April.

The annual rainfall in the State varies from 36.24 cm. About 70 percent of the annual rainfall is received during the monsoon season (July to September) and the remainder in other months. The average annual rainfall in the State is 59.43 cm.

The total area under irrigation is 2.83 million hectares which is 70.4 per cent of the net area sown. The tube-well irrigation covers 54.06 per cent of the irrigated area, whereas canal irrigation supplies the remainder. The total number of tube-wells of irrigation in the State was 184,000 in 1970-71 as compared with 26,066 during 1965-66.

The cropping intensity in the State during 1969-70 was 137.2 per cent as against 128.5 in 1965-66. This means more than one crop per year on much of the land.

The production of foodgrains during recent years has been more than doubled, rising from 3.38 million tonnes in 1965-66 to 6.94 million tonnes in 1969-70. In the corresponding period, the wheat production increased by about two and one-half times from 1.91 million tonnes in 1965-66 to 4.92 million tonnes in 1969-70. The average yield of wheat in the State went up from 12.36 to 22.45 quintals (100 kilos) per hectare during the same period.

The production of rice also increased by 83.3 per cent, during the last five years.

The increase in grain production is due to the introduction of high yielding varieties of crops made available by the Punjab Agricultural University coupled with the intensive use of fertilizers and irrigation.

The total area under fruits in the State in 1969-70 was 21,731 hectares. Mango, citrus, pear, grapes and berries are important fruits. The area under vegetables in the State was 30,106 hectares during 1969-70 besides 16,300 hectares under potatoes. The important vegetables grown in the State are tomato, eggplant, chilli, okra, cucurbits, cauliflower, cabbage, carrot, radish, turnip, onion and pea.

The total number of cows, she buffaloes and goats in the state was 0.84, 1.46 and 0.33 million respectively at the time of latest census in 1966. The milk production was about five million litres per day which gave an average consumption of about 400 grams per person per day as compared with the national average of 105 grams and the minimum recommended requirement of milk of 200 grams per person.

The total number of poultry birds in the State recorded during 1968-69 was about 2 million, producing about 150 million eggs per year.

The number of tractors increased many fold during the last 10 years. At present more than 30,000 tractors are in use and there is a great demand for medium sized tractors. The State has about 30 percent of the total tractors working in the country. The threshing of wheat has been almost fully mechanized and levelling and sowing are mechanized up to 13 percent. In the case of maize, land levelling is mechanized up to 42 percent and intercultural operations up to 60 percent. Equipment for harvesting wheat, groundnut and potato has been developed in the University.

The harvesting of wheat with combines has made a beginning and is becoming popular. In the rabi season of 1969-70, only 32 combines were used, whereas in 1970-71 the number of combines increased to 149. The Marketing Federation charged Rs. 250 (7.6 per dollar) per hectare for harvesting and threshing wheat with combines, whereas the cost with manual harvesting and power threshing varied from Rs. 450 to Rs. 575 per hectare. The use of combines proved to be a safeguard against the untimely summer rains. The area covered by the combines during 1970-71 was only 20,000 hectares out of a total 2,160,000 hectares under wheat, or about one percent.

The consumption of fertilizers in the Punjab increased from 236,134 tons in 1965-66 to 1,081,780 tons in 1970-71, a rise of 360 percent. The average consumption of nutrients per hectare in the State during 1970-71 was 33.52 kg. as against 11.32 kg. in India.

Nearly 66 percent of the inhabited villages and rural population are located within one mile of improved roads and another 22 percent come within two miles of improved roads. The State has highly satisfactory rural road links.

The electric energy utilized for agricultural purposes increased over 300 percent from 1960-61 to 1969-70. The percentage consumption for agricultural purposes increased from 14.9 to 35.6 during this period. The demand has been consistently higher by about 30 percent than the available supplies.

The present Punjab State, having merely 1.6 percent geographical area and 2.6 percent cultivated area of India, contributes as much as 74.4 percent to the country's wheat procurement pool.

The above information makes clear that the Punjab is a leading agricultural state in which newer knowledge and practices are being adopted continuously and quickly by the progressive agricultural leaders and farmers. Such a strong and viable agriculture provides a sound basis for generous state support for the agricultural university and, additionally, creates an environment in which the University can make significant contributions to a receptive clientele through carefully conceived, problem-oriented and effectively conducted programs in teaching, research and extension education.

The State of Haryana

Haryana encompasses 16,938 square miles and has a population of approximately 10,000,000. The rural population is 225 per sq. km. The literacy

rate is about 27%, with the literacy of males being 37% and females 15%. The population growth rate for the past ten years has been 31.4%.

The State is divided into seven districts and has 6,669 villages. The villages are usually small, with the majority having a population less than 50,000. Over the last ten years, the tendency has been for the towns to become larger and the very small villages (less than 5000) to disappear.

Haryana has increased its food grain production remarkably during recent years. In 1965-66, the production (in thousand metric tons) was 1985, whereas in 1969-70 the production was 4626, a rise of 133%.

Irrigation plays an important role in Haryana's agriculture. About 40% of the net area sown is irrigated - or 1,408,000 hectares. All but a small portion of this land is irrigated from canals and wells. Improvements and expansion of irrigation has high priority in the state.

About 67% of all workers in the State are in the agricultural sector. The cultivable area per agricultural workers is 1.7 hectares and the per capita gross value of agricultural output is Rs. 595.

In addition to food grains, Haryana has significant production of cotton, sugarcane, and a variety of pulses and fruits.

The livestock potential of Haryana is also great, with excellent prospects in dairying, poultry, sheep, and possibly swine.

By 1970 all villages in the state were electrified, the first state in India to have all villages electrified. The consumption of electricity for agriculture in the State is 42% of total electricity used in the state - the highest in the country.

Between 1968 and 1971, the number of tubewells electrified in the state increased from 28,897 to about 89,000.

About all villages in the state are linked by improved roads.

The consumption of fertilizer in the state has increased about 400% in the last six years.

The State of Haryana adjoins the Delhi District on the north and west. Its close proximity to Delhi provides Haryana with an excellent year-round market for agricultural products. Also, Haryana is becoming heavily industrialized in the Delhi area, a factor which will further improve the economic climate of the State.

The Haryana Agricultural University at Hissar is only 104 miles northwest from Delhi. It is located close to a number of important institutions/ organizations with which cooperative programs are possible. These include the Government Livestock Farm of about 14,000 acres; the Central State Farm for seed production of 6,000 acres; the Indo-Australian Sheep Farm covering 6,000 acres; the Equine Farm of the Ministry of Defense of 2,000 acres; the Central Tractor Training Center with about 400 acres; the Haryana Land

Development and Seed Corporation Farm of 3,000 acres; and a modern Textile Mill.

Much of what was said about the State of Punjab as to agricultural progress in recent years can also be said about the State of Haryana. It is also one of the leading agricultural states of India. The State provides an environment which will encourage the further development and strengthening of the University; an environment conducive for the maximum reception and utilization of the University's problem-solving programs.

The State of Himachal Pradesh

The State of Himachal Pradesh is a mountainous and sub-mountainous area in the northern part of India and is a part of the Himalaya Mountains. It consists of an area of about 22,500 square miles. Nearly one-half of the area, 11,000 square miles, was a part of the Punjab until 1966 when a division took place shifting this area to Himachal Pradesh.

The state is divided into 11 districts. The population of the State is about 3.5 million and the average density of population is only about 150 per square mile compared with about 700 in the Punjab.

There is much grazing territory and cattle, sheep and goats make up a substantial part of the agriculture. Only about 12% of the area is in cultivated crops as compared with 80% in the Punjab. A variety of crops are produced in the state. Temperate fruits and vegetables do well in many parts. The soils and climate are quite different in this hill country and valleys than on the plains of the Punjab and Haryana. As would be expected the temperatures vary widely in the state and the rainfall is quite high in most areas, from 80 to 200 centimeters per year.

II. THE OHIO STATE UNIVERSITY PRELIMINARY PROGRAM - The Regional Contract for Northwestern India - 1955-1964

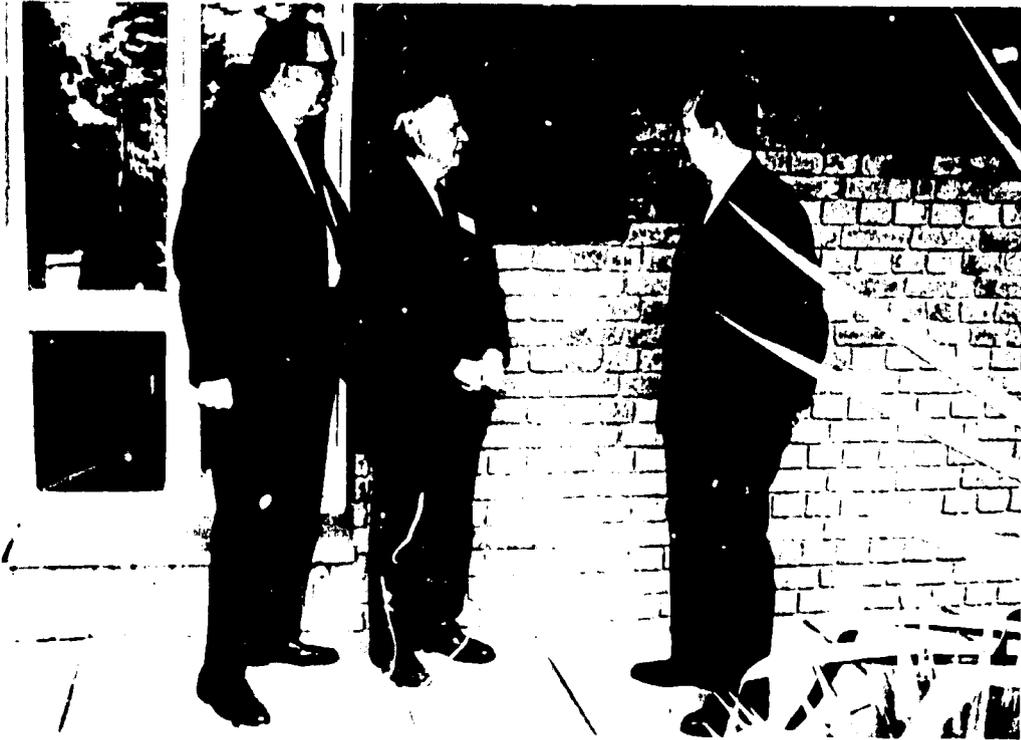
The Ohio State University entered into a contract (TCA-W-18) with the United States International Cooperation Administration, September 12, 1955 to assist in the development of education, research and extension in agriculture in Northwestern India, including the States of Rajasthan, Pepsu, Punjab, and Himachal Pradesh. The program was conducted under this contract to 1958, and then was continued by a new contract ICA-W-630 effective May 21, 1958. More specifically, the original contract stated that The Ohio State University was "to render such advice and assistance to the Ministry (of Food and Agriculture) as may be appropriate to effectuate the general purpose of strengthening the Indian agricultural institutions engaged in education, research and extension in performing their key roles in India's agricultural development and such other purposes....by carrying out....projects and activities in the fields of agriculture, animal husbandry, veterinary science and home economics...."

This program had been recommended to the administration of The Ohio State University by Dean Leo L. Rummell and Associate Dean T. S. Sutton of the College of Agriculture and Home Economics after they had made a preliminary visit to India in April and May of 1955 at the request of the U. S. Technical Cooperation Mission in India. They visited and counselled with the national and state leaders of Agriculture in India and saw the principal facilities for research and education in order to determine the advisability of OSU engaging in such a program and to observe the needs of the area which would provide the guidelines for the development of a cooperative program.

The program developed by The Ohio State University consisted of three parts: (1) assigning individual OSU faculty members to India for periods of a few weeks to two or more years, (2) programming, supervising and financing both advanced academic and special training of individuals from India at OSU and other U. S. institutions in accordance with the needs of the developing Indian institutions, and (3) purchasing in U. S. and shipping to India of library materials, laboratory equipment, and other materials not available in India, but needed for the development of agricultural education and research in India. In addition the U. S. Technical Cooperation Mission (later the USAID Mission) in India provided important services of backstopping the program and, along with the Government of India, provided complementary financial support.

A. OSU FACULTY ASSIGNED TO NORTHWEST REGION OF INDIA

The first four OSU faculty and their families arrived in India on the Regional Contract October 6, 1955. The Group Leader, T. S. Sutton, was stationed at Ludhiana in the State of Punjab; C. L. Blackman, Dairy Specialist, was located at Bikaner in the State of Rajasthan; E. L. Dakan, Poultry Specialist, and J. P. Schmidt, Rural Sociologist, were also located at Ludhiana. In November Russell O. Olson and family, Agriculture Economist, arrived and was stationed at Patiala, Pepsu State (in 1947 it became part of



OSU First Chief of Party, I. S. Sutton, 1955-57 (center); Russell O. Olsen (l) 2nd Chief of Party, 1957-59; and Leonard Saccio, AID Mission Director, 1970.



OSU 3rd Chief of Party, Raymond E. Cray, 1959-1963.

the Punjab State). Guy Dowdy and wife, Extension Training Specialist, arrived in March and were stationed at Ludhiana. The initial group of OSU faculty was completed with the arrival in July and August, 1956 of J. D. Grossman, Veterinarian, and Olin W. Mintzer, Highway Engineer. Dr. Grossman was stationed at Bikaner at which time Dr. Blackman moved to Udaipur, Rajasthan. Dr. Mintzer was stationed at the University of Punjab at Chandigarh.

On the regional contract, 1955 to 1964, The Ohio State University stationed 11 faculty members in the State of Rajasthan, and 21 in the Punjab (mostly at Ludhiana). See Appendix Table 1. However, the total number of individuals in the region was 29 since 3 individuals were stationed part time in both places. Five of the 29 advisors were short term advisors and 24 were long term. A total of about 821 1/2 man months' OSU faculty time was spent in India.

Each of the OSU specialists was supposed to "render assistance where needed in developing courses of study including laboratory and field exercises, research programs, teaching techniques and aids and extension programs in the field of his specialization."

All of the OSU faculty in the field were stationed where an agricultural educational institution was located except two chiefs of party who were located at the capital of the Punjab at Chandigarh so they could work with the agricultural governmental leaders of the Punjab.

At Bikaner the OSU faculty worked with the College of Veterinary Science and Animal Husbandry which was established August 16, 1954, one year prior to the arrival of OSU personnel.

At Udaipur the OSU personnel worked with the Rajasthan College of Agriculture which just started August 1, 1955.

At Ludhiana, the OSU group worked with the Government Agricultural College which was started in June, 1949.

At Patiala, where one OSU specialist was located, consideration was being given to establishing an Agricultural College, but this was abandoned when the State of Pepsu was absorbed into the State of Punjab. The specialist worked with governmental agencies, other schools, and extension training centers.

At Karnal, the OSU specialist worked closely with the National Dairy Research Institute which had just been moved there from Bangalore.

The Highway Engineer worked closely with the University of Punjab in Chandigarh.

Even though the OSU faculty worked closely with the institution at the station where they were located, they also worked with other agricultural schools, extension centers, and government institutions in the region. This particularly included the S.K.N. Agricultural Institute at Jobner, near Jaipur, the Capital of the State of Rajasthan, and the Government College of Veterinary Science and Animal Husbandry at Hissar in the State of Haryana, (formerly part of the State of Punjab, started in February, 1948).

Besides working in their specialized field, the OSU faculty in India, had frequent discussions and consultations with government officials and

other leaders in the area. The Group Leader, especially, worked closely with these leaders and officials. All of this influenced considerably the organization and development of the land-grant type of agricultural universities which followed.

The Group Leader was the OSU administrative officer in India. Besides being in close relationship to government officials and leaders in the area, he took leadership in evolving the future program. He consulted frequently with the US/TCM or AID mission personnel in India. The Group Leaders from the five U. S. Universities working in India met together occasionally to exchange ideas and coordinate programs of development in the various regions.

B. OSU ADMINISTRATIVE AND FACULTY SUPPORT

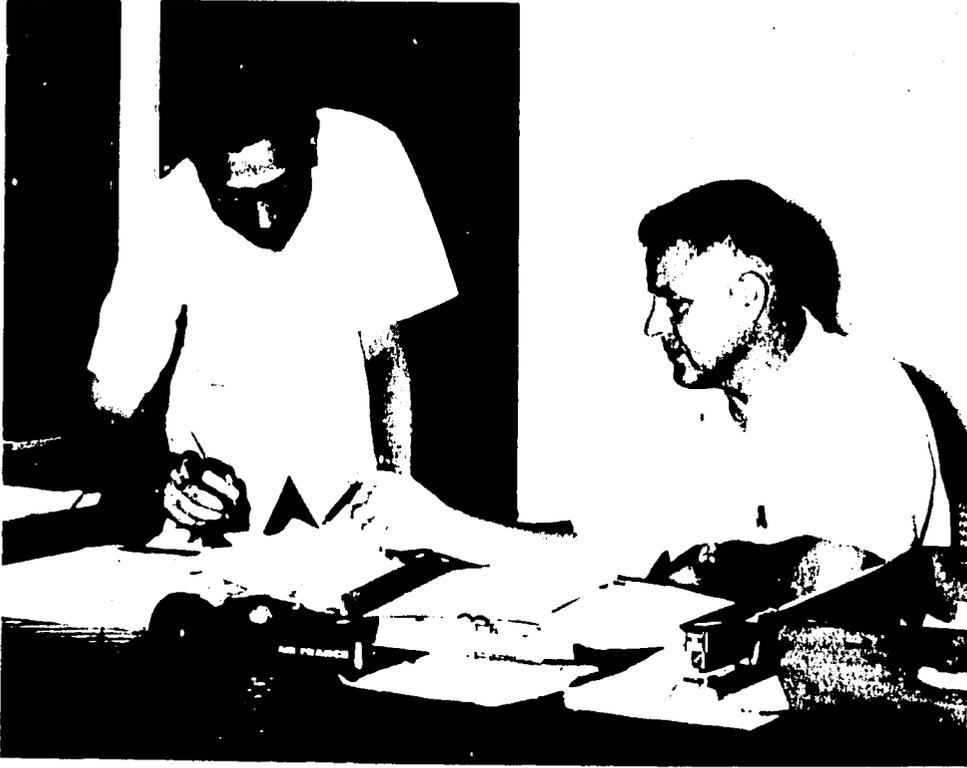
A vital and important part of the program was the contribution and cooperative support of the total program by the administration and faculty on the OSU campus at Columbus, Ohio.

The President of The Ohio State University and the Dean of the College of Agriculture and Home Economics were the senior administrators for the program (Appendix Table 3a). They made decisions of policy in regard to the management of the program by The Ohio State University. The final decision rested with these top administrators as to the assignment of faculty to India with concurrence of the Indian institution and Government and of TCA or AID. This needed to be done very carefully to provide the best faculty person for the job in India and still not disrupt and weaken the on-going operations of The Ohio State University as well as the Ohio Research Program and the Extension Service.

In addition to the President of OSU and the Dean of the College of Agriculture and Home Economics, (the Dean is also Director of the Ohio Agricultural Research and Development Center and Director of the Ohio Cooperative Extension Service), the Associate Deans of the College, Natural Resources, and Home Economics; the Associate Director of the Ohio Research and Development Center and the Associate Director of the Ohio Cooperative Extension Service were involved in the administration of the program. Some of these administrators made trips to India to observe, consult and advise on the program.

A campus coordinator was assigned to the program from the beginning and he played an important role, backstopping and managing the various parts of the program which needed to be done on the OSU campus (Appendix Table 3b). His work was vital to all three parts of the program. For the OSU faculty assigned to India, he communicated with the administration, particularly the Dean and the Chairmen of departments of OSU as to the professional and personal requirements of the faculty person to be considered. He then helped to orient and prepare the OSU faculty person and his family to go to India, helped them to get there and return, maintained close communication with the group leader and others, and provided backstopping for the field staff in India.

For the Indian individuals to come to U. S. for training, he provided the programming, the management, and financial support for each individual while they were in the United States. He was instrumental in purchasing and



l. to r. Des Raj, Administrative Assistant to OSU, 1958 to 1972,
and OSU Harold R. Capener, Rural Sociologist, 1958 to 1963.



OSU George R. Gist (r), Agronomist in India, 1961 - 1963.

shipping to India the special equipment and library materials. He made a number of visits to India to keep abreast of the situation there and to consult on the development of the entire program.

Many of the faculty and administrators of The Ohio State University on the campus at Columbus made contributions to the program by making executive trips to India (Appendix Table 4), advising and helping with the training in the United States and generally consulting on various aspects of the program.

The Campus Coordinators of the five U. S. universities and other administrative officials, along with representatives from TCA or AID Washington, and sometimes from TCM or AID in India, met annually on one of the U. S. campuses. This afforded excellent opportunity to share ideas for improvement of programs, to work jointly on solutions to common problems, and to cooperate in every possible way.

C. INDIANS FROM NORTHWESTERN INDIA TRAINED IN THE U. S.

An important feature of the OSU regional program was the selection of staff members from the cooperating colleges and institutions for advanced training in the United States. The first seven Indians arrived in the U. S. in 1957. They had been selected in the previous year and prepared themselves to go to the U. S. They were sent for one year to The Ohio State University. Part of them completed a Master of Science Degree in a professional area; others had special training for a specific area of work.

From 1955 to 1964 on the regional contract, 102 Indians were sent to the U. S. for training. Of these 25 were still in the U. S. at the termination of the regional contract October 31, 1964, and were transferred to the two new AID/OSU University of Udaipur and Punjab Agricultural University contracts. At first the trainees were sent for about 12 months for special training or Masters of Science degree, but later they were sent for two or three years in order to complete a Ph.D. degree.

From Rajasthan 56 Indians were sent for training from 1955 to 1964 (see Appendix Table 6). These were employed at the time mostly at the College at Bikaner in Veterinary Medicine and the College of Agriculture at Udaipur, with a few at the state government in agriculture. Most of these individuals are employed presently by the University of Udaipur at Bikaner, Jobner and Udaipur campuses or by the State Government. Some of them are assuming positions of leadership.

From States of the Punjab (including Haryana) and Himachal Pradesh, 46 Indians were sent to the U. S. for advanced training on the regional contract from 1955 to 1964. (See Appendix Table 5). They were employed at the time as follows: 22 at Agricultural College at Ludhiana, 16 at Veterinary Science and Animal Husbandry College at Hissar, 6 from the National Dairy Research Institute at Karnal, and 2 from the Agriculture Department of the State of Himachal Pradesh. At the termination on October 31, 1964 of the regional contract, 15 of these 46 Indians were still in training in the United States and their support was transferred to the new AID/OSU Punjab Agricultural University contract which followed.

A large proportion of the trainees from 1955 to 1964 are still employed by either the Punjab Agricultural University at Ludhiana, the Haryana Agricultural University at Hissar, or the National Dairy Research Institute at Karnal. The few others either moved to other agricultural universities, to state agricultural departments, international programs, private business, or their location is unknown. Some of them are assuming leadership positions.

It is difficult to measure, but it is widely believed that the advanced training of the 105 Indians from the Northwestern Region of India was a basic and most important part of the assistance program. This provided a group of trained leaders that certainly contributed much to the greatly improved status of agricultural education, research and extension organization and programs in the region.

At the time the Punjab Agricultural University and the University of Udaipur were being organized in 1962, 1963, and 1964, it was considered important for the Indian administrators of these universities to visit the United States and in particular The Ohio State University, in order to understand the U. S. land-grant type institution. While it could not be expected that the Indian University would be exactly like the U. S. land-grant universities, it was thought that the general principles and philosophy with regard to the purpose and functions would be about the same. The Deans of the agriculture and veterinary colleges involved in the new universities and the Director of Research for The Punjab Agricultural University were brought to The Ohio State University in 1963 (See Appendix Table 7).

This visit of the administrative people from India also was helpful in building an understanding and cooperative working relationship among administrators of The Ohio State University. These Indian administrators later became most influential in helping develop the Indian Universities.

D. BOOKS, EQUIPMENT, AND SUPPLIES PROVIDED FROM THE U.S.

Important in the development of the Educational and Research Institutions in the northwest region was assistance in development of libraries and the equipping of laboratories.

From 1955 to 1964 The Ohio State University purchased and shipped \$756,204 of books and equipment to the agricultural institutions in the northwest region. This included about 6000 books and 3600 items of equipment.

About 2000 of the books went to Ludhiana and about 2400 to Udaipur, and a smaller number to Bikaner, Himachal Pradesh State Government at Simla, the Punjab State Government, to Hissar and the National Dairy Research Institute.

About 1500 items of equipment went to Ludhiana, 700 items to Hissar, 413 items to Bikaner, 398 items to Udaipur, 325 items to the National Dairy Research Institute, and the remaining to the Punjab State Government, Himachal Pradesh State Government at Simla, and the Indian Council of Agricultural Research at New Delhi.

Besides books and equipment which were purchased, faculty at The Ohio State University, especially former OSU advisors on the program, donated a considerable number of journals and books to the Indian Institutions.

E. THE ESTABLISHMENT OF LAND GRANT TYPE OF STATE UNIVERSITIES IN NORTHWESTERN INDIA

From the beginning of the OSU program in 1955, one objective was to develop Land-Grant type of universities in the Northwestern region of India with functions of extension, research and teaching. India had many so-called traditional types of colleges and universities which were generally service-oriented and limited mainly to teaching. Any research and extension functions were handled by the State Governments.

The OSU group leader and team members and the executive visitors on many occasions discussed with officials and agricultural leaders in the state governments the need to combine the existing institutions in the state into one University with all three functions of teaching, research and extension education. It was reported that when OSU President Novice G. Fawcett made an executive visit to India, he was most influential in convincing certain leaders that Land Grant type of State Universities should be developed. By 1960, each state in India was being urged to develop such a university by the central government, especially by the Indian Council of Agricultural Research.

Punjab Agricultural University

Considerable discussion took place in Punjab State in 1958 and 1959 about forming rural universities with responsibilities for all three functions of agricultural education, extension education and research. In October, 1960, a committee was formed in the State of Punjab to plan the organization and development of an Agricultural University. This consisted of State Agricultural Officials, the Principals of the two Colleges at Ludhiana and Hissar, and the OSU group leader. It was generally agreed that college education, research and extension education could be separated from the State Department of Agriculture.

A proposal for setting up the Punjab Agricultural University was worked on by OSU team members and the state officials of agricultural offices. This was discussed and presented to other state officials. In October, 1961, the Punjab legislature passed the act creating the Punjab Agricultural University.

The Punjab Agricultural University was to serve the entire state of Punjab which at that time included part of Himachel Pradesh and most of the present State of Haryana, a total area of 47,334 square miles, 4% of the land area of India.

The Punjab Agricultural University was started in 1962. It included two well established campuses, one at Ludhiana and the other at Hissar. The nucleus for the Ludhiana campus was formed when non-Muslim students and faculty migrated from the Government College and Research Institute at Lyallpur (Pakistan) at partition in 1947. After a short stay at Khalsa College at Amritsar, the unit was established at Ludhiana in 1949 in an old high school building. The campus development started in the fifties with the main Agricultural building being completed and occupied in 1957.

The Hissar campus was established in much the same manner. The Punjab Veterinary College was located at Lahore (Pakistan) and at partition a group of non-Muslim students and faculty moved to East Punjab (now India). Students



U. S. Ambassador John K. Galbraith speaking at formal dedication ceremonies of Punjab Agricultural University, 1963



U. S. Vice-Pres. Hubert Humphrey visiting PAU, February, 1966



Ohio U. S. Senator Robert A. Taft visiting PAU, December, 1968

were first sent to other Veterinary Colleges in India, but in 1948, a new college, The Government College of Veterinary Science and Animal Husbandry, was opened at Hissar near the large Government Livestock Farm.

After forming the Punjab Agricultural University the teaching program was expanded to provide instruction for students in agriculture and the basic sciences. The B.Sc. in agriculture could be obtained then at both campuses.

University of Udaipur

In December, 1960, the Governor of Rajasthan set up a Governing Board to manage and control the institutions in the state which would become the nucleus of a proposed university. This included the Rajasthan College of Agriculture at Udaipur along with its poultry farm and an extension wing, the College of Home Science operated by the Rajasthan Mahila Vidyalaya at Udaipur, the Agricultural Chemistry and Plant Pathology Sections of the State Department of Agriculture, and the Training Program for the staff working in the Intensive Agricultural Cultivation in Pali.

On May 9, 1962, the Rajasthan Legislative Assembly passed the Agricultural University Legislation establishing the "Rajasthan Agricultural University". It included the Rajasthan College of Agriculture, the S.K.N. College of Agriculture at Jobner, and the College of Veterinary and Animal Science at Bikaner. The legislation basically was patterned from a Model Act which had been developed by the Indian Council of Agricultural Research in association with U. S. Land Grant Universities and U. S. Foundations.

In 1963, the Rajasthan Act was amended making it less like the Model Act and more in conformity with the Acts for traditional Indian Universities. The name was changed to the "University of Udaipur". These changes without doubt slowed down the development of the University of Rajasthan as a peoples' university, serving the entire state in Agriculture. The name change itself gave the impression that it was a local rather than a state-wide institution and it left out the emphasis on agriculture. The Maharana Bhupal (M.B.) College of Basic Sciences and Humanities at Udaipur became a college of the University. This was a relatively large, well established traditional-type institution, with an administration and faculty which did not have the concept of a service-oriented University nor an appreciation or understanding of agriculture. In addition, seven other small colleges, institutes and schools in the Udaipur area became associated/affiliated units of the University, including the Home Science College at Udaipur. These were more or less autonomous in their operation, but they required attention of the University Administration and they were included to some extent in policy making for the University. They also did not have appreciation of agriculture and were devoted to teaching, rather than extension or research. This tended to diminish the Land Grant type university development in the state which would give equal importance to extension and research as to teaching.

In 1964, the College of Technology and Agricultural Engineering was authorized at Udaipur. Internal grading (rather than traditional external grading) and the semester system were introduced in the Colleges of Agriculture and the College of Veterinary and Animal Science, but not in other parts of the University, particularly the M. B. College of Basic Sciences and Humanities. A Director of Research in Agriculture was appointed in Udaipur in 1964.

F. ACCOMPLISHMENTS 1955-1964

Many accomplishments could be detailed as a result of the OSU regional program from 1955 to 1964. Some of the major benefits to the institutions and the States are summarized as follows:

1. Developed interest on the part of leaders in agriculture in the States to establish Land-Grant types of State Universities service oriented to the people with integrated functions of education, research and extension.
2. Helped develop state laws in Rajasthan and Punjab to establish Land-Grant type of Universities.
3. Provided special advanced training in U. S. for 102 Indians from the Colleges and state agencies in the region.
4. Increased the professional competence of many faculty members in
 - a) the College of Agriculture and Veterinary & Animal Science in Rajasthan as eleven OSU faculty members worked along side the Indian faculty members in teaching, research and extension, and
 - b) the Government Agricultural College, National Dairy Research Institute, and related agencies in Punjab as 21 OSU faculty members worked along side the Indian Faculty in teaching, research and extension.
5. New courses developed, new equipment introduced, new methods of teaching initiated, new youth organizations started, and a new life and enthusiasm generated in the Colleges by The Ohio State University faculty working on the campuses at Udaipur, Bikaner, Ludhiana, and Karnal.
6. Provided substantial expansion to college libraries at Ludhiana, Hissar, Bikaner, Udaipur, National Dairy Research Institute, and others.
7. Advised on the registration and administration of student programs at the University of Udaipur and The Punjab Agricultural University.
8. Helped initiate an extension education program by the University of Udaipur and The Punjab Agricultural University.
9. Initiated education, research, and extension in poultry production by the University of Udaipur and by The Punjab Agricultural University.
10. Initiated and helped develop farm management education and extension - directed toward improved farmer use of agricultural technology at Udaipur, Jobner, and Ludhiana areas.
11. Contributed substantially to the organization of research and to the development of Research Lands and physical facilities at both Ludhiana and Hissar campuses of The Punjab Agricultural University.

12. Helped develop a Masters degree program in Farm Management at Punjab Agricultural University at Ludhiana.
13. Helped plan the organization and curriculum for the College of Agricultural Engineering at the Punjab Agricultural University at Ludhiana.
14. Helped plan the Masters degree program in Poultry for the Punjab Agricultural University, Ludhiana.
15. Helped develop and expand Agronomic Extension Education and research programs in field crops (Agronomy) at Government Agricultural College at Ludhiana, and in the State of the Punjab.
16. Helped initiate the area of Rural Sociology in the Government Agricultural College at Ludhiana - teaching, research, and extension.
17. Helped initiate research, teaching and extension education in Agricultural Marketing in the Punjab State.
18. Assisted in development of Highway Engineering in the State of Punjab.
19. Helped initiate considerable research and improvement in teaching in dairy science and dairy technology at the National Dairy Research Institute at Karnal.
20. Helped develop extension information and a publication system at the Government Agricultural College and Punjab Agricultural University at Ludhiana.
21. Work was initiated in animal nutrition at the Government Agricultural College at Ludhiana.
22. Provided assistance to development of Departments of Agriculture and Veterinary Medicine of the Government of Himachal Pradesh at Simla.
23. Developed and improved laboratories in the fields of soils and agricultural engineering at Udaipur.
24. Developed and improved laboratories of Veterinary Anatomy and Veterinary Surgery at Bikaner.
25. Helped develop dairy herds and dairy production education at the colleges at Bikaner and at Udaipur.
26. Helped design and provide equipment for a dairy processing plant at the College of Agriculture in Udaipur.
27. Developed new educational materials and research on Veterinary Anatomy, especially as it pertains to the camel, at Bikaner.
28. Helped develop and improve procedures and education in veterinary surgery at Bikaner.

29. Helped develop plans for a College of Technology and Agricultural Engineering at Udaipur.
30. helped develop educational and research programs and facilities in soil analysis at Rajasthan Agricultural College at Udaipur.
31. Started development and improvement of Home Economics Education for the State of Rajasthan.

III. OSU/AID CONTRACT 147
Program with The Punjab Agricultural University
and The Haryana Agricultural University
1964--1973

The Legislature of the State of Punjab passed the Act in October 1961 creating the "Punjab Agricultural University". The Legislature of the State of Rajasthan passed an Act in May, 1962 creating the "Rajasthan Agricultural University" (the name was changed in 1963 to the "University of Udaipur".) Both of these universities were started in 1962.

From 1955 to 1964 The Ohio State University worked under one contract with all of the agricultural colleges and government agencies in the northwestern region of India. However, as the two Agricultural Universities began to develop, the OSU program became more concentrated with these two Agricultural Universities. Since these were two separate programs in separate states, the OSU program was logically divided into two parts. This led to the development of two separate AID contracts, which became effective November 1, 1964.

Up to this time there was one OSU group leader who was stationed in the Punjab. With the separation of the programs and new contracts, each program had a group leader, one in the Punjab at Ludhiana and one in Rajasthan at Udaipur.

When the program was initiated November 1, 1964, The Ohio State University (OSU) with the financial assistance of USAID, agreed to assist the State of the Punjab and the Punjab Agricultural University (PAU). What is now The Haryana Agricultural University (HAU) was, until February 1970, the Hissar campus of the Punjab Institution, and accordingly was provided assistance under the terms of the Contract. After bifurcation occurred in 1970, with the formation of the Haryana Agricultural University in the State of Haryana, The Ohio State University continued to assist this Institution by an informal agreement between OSU and USAID but under the existing contract for the Punjab Agricultural University. Therefore, this Termination Report includes pertinent information on both the Punjab and the Haryana Agricultural Universities.

A. PURPOSES AND OBJECTIVES OF THE PROJECT

The general purpose of The Ohio State University/USAID program of assistance for the State of Punjab and the Punjab Agricultural University is set forth in the contract document as follows:

".....The Ohio State Universitywill assist the State of the Punjab, India, in the establishment of the Punjab Agricultural University, an institution to serve agriculture and the rural economy of the State through the expansion of knowledge and diffusion of it among the people. The Contractor (The Ohio State University) will assist the State and the University in developing policies, plans and programs and will advise on the organization, administration and operation of the University; on the development of resident instruction, extension

and research programs on ways and means by which the sons and daughters of rural people and others may be provided opportunities for training in modern agriculture; and on the planning, construction and maintenance of physical facilities and equipment of the University and associated undertakings."

The project purpose as given above for the Punjab has also been applicable to the State of Haryana and the Haryana Agricultural University since 1970.

Under the broad agreement between USAID and the Government of India, the specific intention of the Agricultural University development program was to assist in the development of State agricultural universities along the pattern of the Land Grant Institutions of the United States. A State Government requesting assistance under this program, along with its agricultural university, signified willingness to accept this concept of development and to make the adjustments necessary for the development of the institution in accordance with recognized criteria. These criteria pertained to such matters as autonomy of the institution, adequate state financial support, appropriate State Act/Statutes, full responsibility of the university for statewide agricultural research and extension education, integration of teaching, research, and extension within the university, and modernization of the academic practices in respect to term scheduling, internal examinations and teaching methods. Such was the mutual understanding which prevailed when The Ohio State University/USAID program became operative in the State of the Punjab and later in Haryana.

In 1971, the USAID initiated a project evaluation program which identified nine conditions which should prevail at the end of a project period for an Indian Agricultural University. These conditions or criteria not only represented guidelines for evaluating the success-level of a program at any given time, but were a precise statement of long-range objectives for the participating U. S. University. Consequently, they are the objectives for The Ohio State University's program with PAU/H and are as follows (phrased to indicate the ultimate desired conditions at project end):

1. An adequate physical plant
2. Sound long-range improvement and their effective plans for capital development and academic implementation.
3. Adequate financial support from the public sector.
4. Effective integration of teaching, research and extension education at all levels of the institution, including the departments.
5. An adequate number of well-qualified staff.
6. Curricula/teaching relevant to the needs of the student/graduate/ and the State.
7. University programs in research and extension education relevant to the needs of the State/Region/Nation.
8. Effective Administration Performance
9. Functional Professional Linkages with other Indian and Foreign Agricultural Institutions.

B. THE OSU/AID PROGRAM WITH PAU AND HAU

As with the previous regional program, the program by The Ohio State University with PAU consisted of three parts: (1) Assigning of individual OSU faculty members to the Punjab Agricultural University for periods varying from a few weeks to two or more years. (2) Programming, supervising, and financing both advanced academic and special training of Punjab Agricultural University faculty at OSU and other U. S. institutions in accordance with developmental needs of the Punjab Agricultural University, and (3) purchasing and shipping to the Punjab Agricultural University library materials, laboratory equipment and other supplies and materials not available in India, but needed for the development of the University.

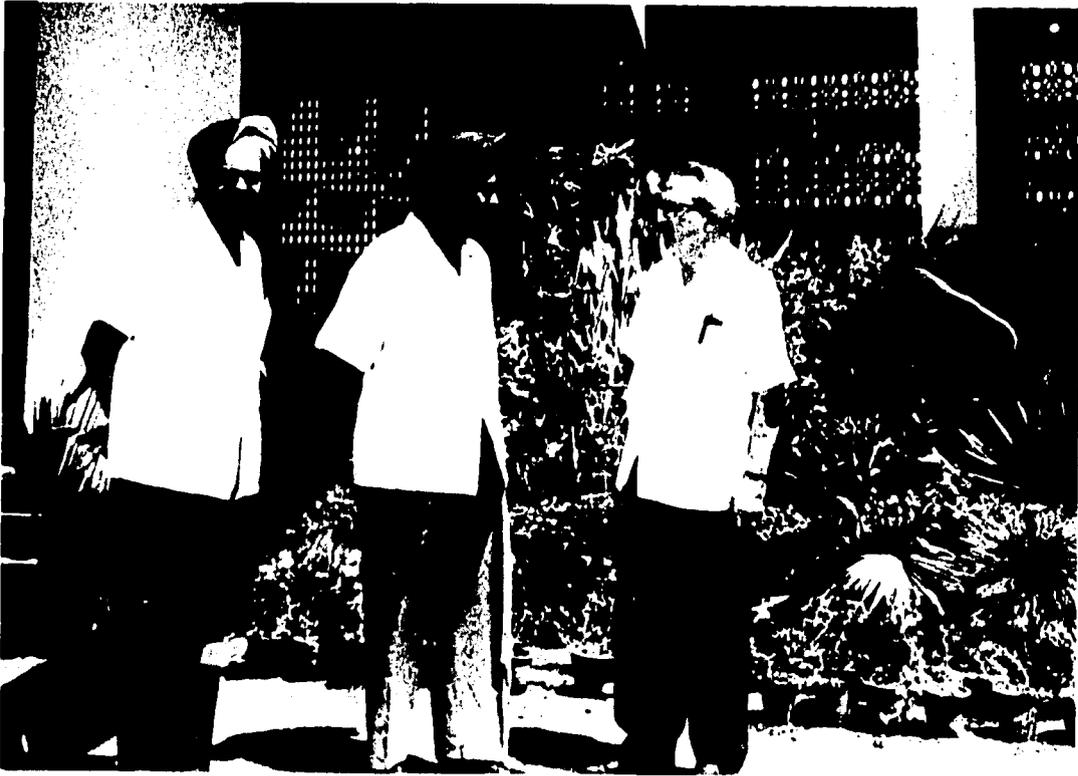
The Ohio State University US/AID program with the Punjab Agricultural University was a complex operation considering all of the agencies involved: the Punjab Agricultural University, the Punjab State Government, the Haryana Agricultural University, the Haryana State Government, the Central Government of India, the USAID Mission in India, the USAID in Washington, D. C., and The Ohio State University. More specifically the program was conceived as providing for an intimate collaboration between two institutions, The Ohio State University and the Punjab Agricultural University (later also with Haryana Agricultural University), each dedicated to the same goals and anticipating mutual benefits, and that this collaboration could continue after the AID contract program terminated. However, this viewpoint was only partly accepted or promoted by many of the people in the two central Governments.

The Ohio State University costs of the program were financed mainly by USAID through the contract. Besides the dollar support the USAID Mission provided rupee support in India from U. S. owned rupees generated from U. S. exports to India. Rupees were used to pay for OSU faculty special expenses and costs in India, including the various allowances for education, housing, and transportation. Trust fund rupees were used to finance special demonstration and developmental projects on which OSU faculty and Indian University faculties cooperated and this enabled the OSU faculty to accomplish much more as will be indicated later in this report. The Indian Government, both Central and State government, provided funds for the Indian university development programs including some of the expenses for OSU faculty, some costs related to the training of the Indian faculty, and provision of equipment and supplies.

C. OSU FACULTY ASSIGNED TO PAU AND HAU

The assignment of OSU faculty to India was the first and basic part of the program. Careful study was made by the Indian leaders, The Ohio State University administrators, and the AID/Mission to arrive at the critical areas in which OSU specialists were needed. As the program progressed the additional needs became evident and new OSU faculty were added.

In the early years of the program, OSU specialists were assigned for long terms (more than one year). As the program matured at the Punjab Agricultural University, more short term OSU faculty were programmed. It was definitely most important when a department was started that the OSU faculty advisor was needed for a longer period in order not only to help with the planning, but to work along side the Indian staff to develop new courses, new research projects and extension programs.



OSU 4th Chief of Party, Wilbur B. Wood, 1963-1967.



OSU 5th Chief of Party, Cecil A. Lamb, 1968-1971.

A total of 48 OSU faculty members served 955 man months in the Punjab, Haryana, and Himachal Pradesh area from 1955 to 1973 (Table 1) - 21 on the regional contract from 1955-64, for 576 man months, and 33 on the University Contract from 1964-73, for 379 man months, with 6 working on both contracts. Besides these, OSU sent 17 others to India for 110 man months on our Agricultural Engineering-Ford supported project as explained later.

Table 1. Number of OSU Faculty and Location of Work in States of Punjab, Haryana, Himachal Pradesh.

CONTRACT	LOCATION					TOTAL	
	Ludhiana (PAU) No.	Hissar (HAU) No.	Patiala No.	NDRI No.	Chandigarh No.	No. Indi- duals.	Man Months
Regional 1955-64	17	--	1	2	3	21	576
University 1964-73	24	14	-	-	-	33	379
TOTAL	41	14	1	2	3	48*	955*

* 10 individuals were stationed and worked at more than one place.

The total number of assignments or terms of duty of OSU Faculty was 63 including 37 long term (1 to 2 years) and 26 short term (less than one year) (Table 2).

A total of 36 different Ohio State University faculty worked at Ludhiana or PAU, 17 on the regional contract and 24 on the University contract with 5 of them overlapping on both contracts. There were 28 long term and 18 short term (5 jointly with HAU) assignments.

At Hissar or HAU 14 different OSU faculty members worked, all of them on the University Contract since 1964. Of these only 2 were on long term assignments, one for 1 year and the other for 2 years.

Two OSU faculty had assignments at the National Dairy Research Institute on the regional contract from 1955-64; one on two long term assignments and one on a short term assignment.

One OSU faculty member was stationed at Patiala, Pepsu State, (later absorbed as part of the Punjab State) on the regional contract. One OSU faculty member, a highway engineer, was located at Chandigarh.

Table 2. Number and Location of Long Term and Short Term Assignments of OSU Faculty in Punjab, Haryana, and Himachal Pradesh.

Term of Assignment	Ludhiana (PAU) No.	Hissar (HAU) No.	Patiala No.	NDRI No.	Chandigarh No.	Total Assignments
Long Term 1 to 6 yrs.	28	2	1	2	4	37
Short term less than 1 year	18	12*	-	1	-	26
TOTAL	46	14	1	3	4	63

*5 of the short term positions were joint with HAU and PAU.

Six OSU Faculty members served as Group Leaders (later called Chiefs of Party) from 1955 to 1973 as follows:

T. Scott Sutton	1955-1957	Regional Contract
Russell O. Olson	1957-1959	Regional Contract
Raymond E. Cray	1959-1963	Regional Contract
Wilbur B. Wood	1963-1967	Regional and University Contract
Cecil A. Lamb	1968-1971	University Contract
Ira A. Gould	1971-72	University Contract

Two other OSU faculty members served as Acting Group Leader or Chiefs of Party during short intervals between the departure and arrival of the Group Leader or Chief of Party; Harold Capener in 1963 and Robert Porter in 1967-68.

From 1955-73 there were 19 different subject matter areas in which long-term specialists from OSU were assigned and 23 areas in which short-term specialists were assigned. The subject matter areas are listed in Tables 3 and 4. A much larger portion of the OSU faculty assistance has been to Ludhiana or The Punjab Agricultural University and there has been a rather broad coverage at this University. On the other hand it is noted that in most cases only one of the sub-areas in any one department has had an OSU specialist.

At Hissar or Haryana Agricultural University very little OSU faculty assistance was provided until the last two or three years, and even then in only a few subject matter areas.

In addition to this contract program supported by US/AID, the Department of Agricultural Engineering of The Ohio State University has been



Dr. Alden R. Winter (l), OSU faculty, Poultry, in India 1965-67 & Dr. Neal Carpenter (r), OSU faculty, Farm Management in India 1959-1965.



Dr. Louis C. Knorr (r) OSU faculty in Citrus Virology in India, 1968-69



Dr. Harvey R. Krueger, OSU faculty, Entomology (r) in Toxicology Lab in India, 1967-69. At left Dr. O. S. Bindra, Head of Entomology, PAU

collaborating with the College of Agricultural Engineering of the Punjab Agricultural University with the financial support of The Ford Foundation.

OSU has sent 17 faculty members for a total of about 110 man months in Agricultural Engineering since 1964, of which one was long term and 16 short term. All but three of these were on the OSU staff.

This program was closely coordinated with the AID supported program by OSU and PAU so that seemingly together they were interpreted as one program with OSU and PAU.

Table 3. Subject Matter Areas with Long-Term Assignments of OSU Faculty (one year or more)

Subject Matter	Ludhiana PAU	Hissar HAU	Patiala	NDRI	Chandigarh
1. Overall Agriculture Educational Organization	x				
2. Rural Sociology	x				
3. Poultry	x				
4. Agricultural Economics	x		x		
5. Farm Management	x				
6. Agronomy	x				
7. Research Organization & Administration	x				
8. Extension Organization & Administration	x				
9. Extension Publication & Communication	x				
10. Home Economics College Dev.	x				
11. Food Science & Technology	x				
12. Entomology	x				
13. Citrus Virology	x				
14. Seed Multiplication & Distribution	x				
15. Weed Control		x			
16. Animal Nutrition		x			
17. Soil Survey & Classification	x				
18. Highway Engineering					x
19. Dairy Technology				x	

**Table 4. Subject Matter Areas with Short-Term Assignments of OSU Faculty
(less than one year)**

Subject Matter	Ludhiana PAU	Hissar HAU	Patiala	NDRI	Chandigarh
1. University & College Administration	x	x			
2. Dairy Engineering	x			x	
3. Animal Nutrition	x				
4. Poultry		x			
5. Registration Administration	x				
6. Agricultural Engineering College Development	x				
7. Agricultural Communications	x				
8. Animal Science College Development		x			
9. Veterinary Medicine College Development		x			
10. Horticulture Department Development	x				
11. Entomology-Toxicology	x				
12. Animal Physiology		x			
13. Seed Multiplication & Distribution	x				
14. Soil Physics	x	x			
15. Soil Survey	x	x			
16. Horticultural Plant Nutritional Needs	x				
17. Soil & Water Engineering	x	x			
18. Home Science - Dietetics	x				
19. Farm Credit	x				
20. Home Science College Development		x			
21. Veterinary Mycology	x	x			
22. Agricultural Engineering Department Development		x			
23. Agronomy and Soils Department Development	x	x			



OSU Alvin L. Moxon (r) Animal Scientist, in India, 1960-1961.



Asian Agricultural University Development Seminar Delegates visiting Experimental Farm at PAU.

At the termination of the Contract Program, the Administration and Faculty of Haryana Agricultural University were asking for continued and expanded assistance from OSU faculty for a period of about five years. Many departments and many special problem areas would have benefited greatly by having some long term and short term OSU faculty. The University was in a most receptive position as far as faculty and administrative support was concerned as well as with excellent state support so that the University would have benefited greatly over the next few years if the program had been continued. Many subject matter areas had been mentioned where OSU faculty were desired, but the most urgent needs were listed in the following broad areas:

(1) University Organization and Planning (2) Home Science (3) Agricultural Economics (4) Livestock Development (5) Food Science and Technology (6) Extension Education (7) Soil/Water Management, dry land farming, etc.

The Punjab Agricultural University, which had been given more OSU faculty assistance than HAU had received, still expressed need for further assistance over the next two or three years from OSU faculty in the following areas: (1) Animal Science - Genetics, Nutrition (2) Veterinary Science (3) Soil and Water Resources (4) Home Science - Post Graduate, Institution Management, Foods and Nutrition (5) Food Science and Technology (6) Agricultural Business Management (Agri-Business) (7) Floriculture and Landscape Architecture (8) Biophysics (9) Insect Pathology (10) Plant virus serology, and (11) Computer Science.

Upon termination of the AID supported program, it was the desire of both OSU, PAU and HAU that some exchange of professors could continue to take place. It was considered, however, very difficult unless some outside funds were available to help support it. The presence of U. S. faculty at the Universities in India was a stimulus to high quality faculty performance and the further development of the University. Likewise, it was considered beneficial to have highly qualified Indian Professors visiting OSU. It is valuable to the Universities for many of the professors at OSU and the Indian Universities to continue and to expand their linkages with each other as much as possible, especially in research.

D. OSU ADMINISTRATIVE AND FACULTY SUPPORT

The support for the cooperative program between OSU and the PAU and HAU by the OSU administration and faculty became stronger with each passing year of the program, as the number of individuals from all the institutions who were involved with the program increased. A widening genuine interest and pride among faculty developed within each Indian institution and within OSU for the relationship and for the success of both the Indian Institutions and the OSU.

The vital contribution and cooperative support for the program by the OSU administration and faculty on the OSU campus at Columbus, Ohio, continued on the new contract as it was on the regional contract. The top administration and coordinating personnel are indicated in Appendix Table 3. As time went on, more of the departments of the college and faculty members of OSU were involved in making faculty assignments and in the training program of the Indian University faculty members in the United States.



Dean Roy M. Kottman meeting with PAU Administrators in India, 1968.



1. to r. OSU Faculty Neal R. Carpenter, Don L. Steward, with Executive Visitors Wilbur B. Wood and Richard H. Bohning, 1963.

The campus coordinator continued his vital contribution to the program by (1) recruiting, orienting, and backstopping OSU faculty assigned to the field, (2) managing and facilitating the training program for the Indian University faculty in the United States, and (3) purchasing and shipping library books, equipment and supplies essential to the Indian Universities.

There were four OSU coordinators for this program from 1955 to 1973 as follows: Carl R. Reese - 1955-57

Richard H. Bohning - 1957-64

Raymond A. Cray - 1964-65

Mervin G. Smith - 1966-73

In addition, two assistant coordinators served on the program: Harold D. Bauman, 1966-68, and John L. Parsons, 1968-73.

The Ohio State University administrators continued to make executive trips to India to observe, advise and help determine the policies and program (Appendix Table 4). This was most helpful after they returned in providing understanding and communications within The Ohio State University about the program, which in turn broadened and strengthened the support of the program by the University.

The Council of United States Universities for Rural Development in India was organized in December, 1964. The five U. S. universities working in India were the members of the Council, with Pennsylvania State University becoming the sixth member in 1966. This Council was given modest financial support by AID from 1967 to 1972. The Council significantly facilitated the interchange and cooperation among the Universities, USAID/Washington, USAID/India, The Indian Agricultural Universities, The Indian Council for Agricultural Research, and other agencies. The campus coordinators from the five universities previously had some interchange and cooperation on the regional contract, but starting in 1964 and especially since 1967, the Council (CUSURDI) facilitated this much more, both in the United States and in India.

Honorary Degrees Awarded by OSU to Indian Administrators

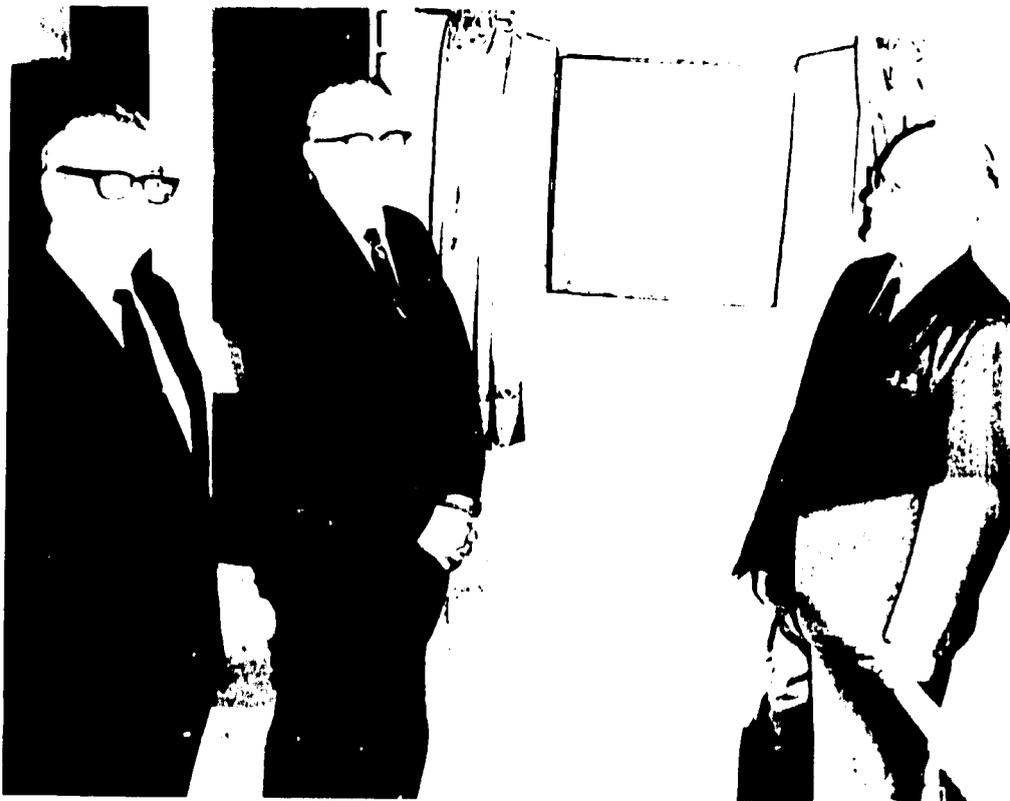
The Ohio State University Administrators and Faculty developed very close working relationships with the Indian Administrators and Faculty on this program. The high regard they have for each other is evident from the honors bestowed on some of the administrators by OSU and PAU.

In Ludhiana, Punjab, India on March 15, 1969, at the Punjab Agricultural University, The Ohio State University held a special convocation for the purpose of awarding an honorary Doctor of Science Degree to Dr. P. N. Thapar, the founding Vice-Chancellor of the Punjab Agricultural University. It was believed by many people that Dr. Thapar had done a most outstanding job of planning and administering the initial development of the University. This occasion was most unusual in that The Ohio State University conducted this special convocation in a foreign country for this purpose.

On the same day, March 15, 1973, the current Vice-Chancellor, Dr. M. S. Randhawa, unveiled a plaque which revealed the new name for the No. 1 Guest House on the PAU campus, the "Sutton House", in honor of Dr. T. S. Sutton, the first Ohio State University Group Leader or Chief of Party, and frequent consultant from OSU on the program.



Special OSU Convocation in India (1969) conferring Honorary Degree on P. N. Thapar, First Vice-Chancellor at PAU. M. G. Smith (left) and T. S. Sutton (right) from The Ohio State University.



Dedication of PAU Guest House as Sutton House in honor of T. S. Sutton (center) OSU 1st Chief of Party. PAU Vice Chancellor M. S. Randhawa (r) and OSU Assistant Dean, Mervin G. Smith (l).

The Ohio State University has planned to award an honorary Doctor of Science Degree to Vice-Chancellor M. S. Randhawa as soon as arrangements can be made for awarding the degree because of his great scholarly achievements.

Special Training for Administrators

It was considered valuable for administrators of the Indian Universities to come to the U. S. to visit OSU. This not only was beneficial to the administrators in learning about the land grant type of institution in the U.S., but it was helpful to the entire program in making it a university-to-university relationship. They were able to get acquainted with many of the administrative people of the OSU and this was quite important in increasing the understanding and willingness to cooperate between OSU and the Indian Universities.

In 1963 the Vice-Chancellor of the Punjab Agricultural University, the Dean of Agriculture at Ludhiana, and the Dean of Veterinary Science at Hissar, along with the Director of Research for Punjab Agricultural University, were brought to the U. S. and in particular to the OSU to observe the organization development and administration of various OSU units and to get acquainted with the OSU administration. (See Appendix Table 7). At least 7 other deans, directors, and heads of departments were brought to OSU for short periods from 1969-72.

Vice-Chancellor M. S. Randhawa from PAU came to the U. S. in 1968 and 1969, and visited The Ohio State University both times. Vice-Chancellor A. L. Fletcher from HAU, was brought to the OSU on the OSU/AID contract Oct.-Nov. 1970, the first year after he became Vice-Chancellor. Both of these Vice-Chancellors benefited greatly from this. V. C. Fletcher, especially, used many ideas from his observations in Ohio in the planning of both the program and the physical facilities of Haryana Agricultural University.

Special OSU Course - Organization and Administration

For those in training at The Ohio State University a special course for credit was provided on "Agricultural Organization and Administration". This emphasized the principles involved in organization, administration and function of a Land-Grant type of University and related agricultural and rural organizations. Nearly all those who were in training from the Punjab Agricultural University and the Haryana Agricultural University from 1967 to 1973 took this course. This was expected to be helpful to them as they returned and played their role in the development of their respective universities.

Seminars in India for Returned Faculty Trained in U. S.

In 1964 a seminar was held on the University of Udaipur campus at Udaipur for the Indians from the Northwest region who had been in training in the United States on the regional program. The OSU faculty took leadership for this and USAID funds helped support it. Unfortunately very few of the individuals from the Punjab and Himachal Pradesh were able to attend. It was



Indian Faculty Studying at OSU Performing the "Harvest Dance."



Foreign Faculty with OSU Professors
in Special Course.



Seminar in India of Indian Faculty
returned from studying in the U. S.

considered highly successful and worthwhile for those who did attend. Discussions were held on applying the training received in U. S., how to improve teaching, research and extension in India, and recommendations for future trainees going to the U. S.

Another seminar for returned trainees was held in May, 1969 at Simla just for those from Ludhiana, (PAU), Hissar (HAU) and other places in Punjab, Haryana and Himachal Pradesh. The OSU faculty took considerable leadership for this seminar and USAID helped finance it. There were 68 former trainees who attended this seminar and 12 university administrators (including two who were trainees). All of those participating in the seminar agreed that it was successful and worthwhile.

E. INDIAN FACULTY TRAINED IN THE U.S.

The advanced training of Indian Faculty was one of the most important parts of the program.

The selection of the faculty for training was by the administrators of the University with the consultation of the OSU faculty. Generally they were younger faculty members who held a regular faculty position. The training of Indian faculty was in those areas considered critical to development of the College or University. It was necessary to consider what the potential contribution by the individual would be toward the development of the University.

The Indian College or University in most cases continued paying part or all of the salary of the faculty member sent for training to help in his support of his family. The living expenses of room and board in the U. S., the tuition and fees of the U. S. University and other training expenses were supported through the AID contract and paid by The Ohio State University.

The Ohio State University programmed the training of the Indian faculty members in the United States, monitored and managed the program and paid the expenses. The OSU coordinator and faculty experienced in India could do this programming especially well because they were well acquainted with the Indian University needs. The training was tailored to the needs of PAU or HAU or other institutions.

Besides the academic training OSU took special interest in providing other experience and observation which could be helpful to the Indian faculty when they returned to help in the development of the Indian University.

It had been planned originally at the time of selection that the Indian trainees would return to their Indian University or agency and would play an important part in development of the University.

It is noteworthy that PAU and HAU do re-absorb advantageously the faculty members when they return from long term degree programs. Merit awards are given often to those who have been superior in their study abroad. They have a flexible promotion system and provide opportunities for the returned trainees to utilize their training effectively and assure further professional development.

A total of 106 Indians from Punjab, Haryana, and Himachal Pradesh received training in the United States on the OSU Regional and University programs from 1955-73. (Table 5). This included 31 on the Regional contract from 1955-64, 60 on the University contract from 1964-73, and 15 who started on the regional contract and finished on the University contract.

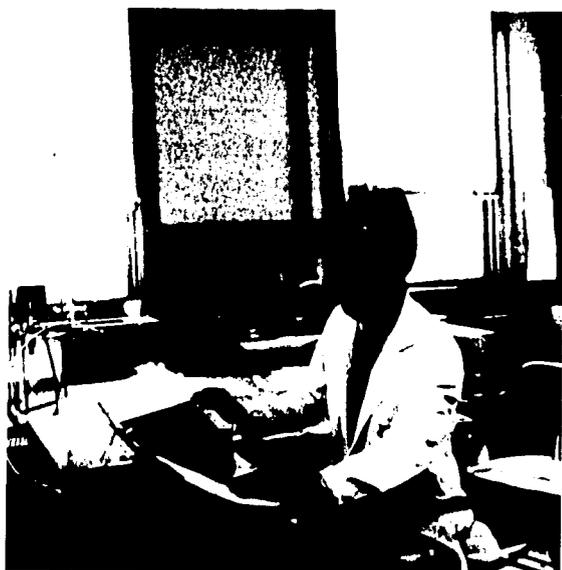
Table 5. Summary of U. S. Training of Indian Faculty in Punjab, Haryana, and Himachal Pradesh Programmed by The Ohio State University, 1955-1973.

CONTRACT	Ludhiana or PAU No.	Hissar or HAU No.	Karnal NDRI No.	Himachal Pradesh State or Univ.	Total No.
Regional Contract 1955-64	12	11	6	2 State	31
Both Regional & University contracts	10	5	-	-	15
University Contract 1964-73	32	27	-	1 - Univ.	60
Total	54	43	6	3	106

A total of 54 Indians from the staff of the Government Agricultural College and the Punjab Agricultural University, Ludhiana campus, received advanced training in the United States from 1955 to 1973 on both the regional and the Punjab Agricultural University OSU contracts. This included 12 on the regional contract from 1955-64; 32 on the University contract from 1964-73, and 10 who started on the regional contract and finished on the University contract.

The number of Indians trained from the College of Veterinary and Animal Sciences at Hissar and later the Haryana Agricultural University was 43, including 11 on the regional contract from 1955 to 1964, 27 on the University contract from 1964-73, and 5 who started on the regional contract and finished on the University contract. A total of six Indian faculty members from the National Dairy Research Institute at Karnal received training in the U. S. on the regional contract from 1955-64. A total of 3 from the state or territory of Himachal Pradesh received training in the U. S.; two on the regional contract from the State Department of Agriculture, and one on the University contract from the Palampur campus of the Agricultural Complex of the University of Himachal Pradesh (this campus started as part of PAU).

Most of the U. S. training was done at The Ohio State University. Of the total of 106 trained, 93 were at The Ohio State University and 13 were at



Indian Faculty Studying at OSU with some of their OSU Advisors

other institutions in the United States. If good training was available at OSU it was generally considered advantageous for them to be trained there, because of the understanding of the needs and the extra interest by faculty at OSU. Most of the trainees were provided opportunity to observe and become acquainted with other universities and outstanding professional work being done in other states of the U. S. during their training period in the U. S.

Since 1967 nearly all of the trainees at OSU took a special course in Agricultural Organization and administration with emphasis on the Land-Grant University and related agencies in the U. S. Special non-academic programming was provided most of the trainees at OSU to get an understanding of agricultural extension and agricultural research. They attended field days, extension functions, professional association and industry meetings, and other activities.

The subject matter areas in which the Indian faculty received training in the U. S. are indicated in Tables 6 and 7. The largest number were trained in the area of Agronomy with 15 and the next largest was Dairy Science with 8. Except for Veterinary Science, more areas were included in the training at Ludhiana or The Punjab Agricultural University. Nearly one-half (20) of the trainees from Hissar or Haryana Agricultural University were in Veterinary Science, and 9 were in Animal Science. This might be expected since the only institution there prior to 1962 was the Veterinary College, and it was a part of the Punjab Agricultural University from 1962-1970, during which time other colleges were added at Hissar including a College of Agriculture. In 1970 it was separated from PAU and became Haryana Agricultural University. At that time a new College of Veterinary Science was started as a part of PAU at Ludhiana. At bifurcation some faculty from each of the Universities transferred to the other.

Of the total of 54 trainees from Ludhiana or PAU, 10 have left PAU. However, six trainees who originally were from Hissar or HAU transferred to PAU. Of the 43 trainees from Hissar or HAU, 14 left. Two from Ludhiana or PAU transferred to HAU.

Nearly all of the trainees who left HAU or PAU continued in important jobs such as with the Food and Agricultural Organization of the United Nations (FAO) or State Departments of Agriculture or Animal Science. Only three of them have jobs in the United States.

In addition to the trainees on the OSU/AID contracts, The Department of Agricultural Engineering of OSU brought 10 Indian Faculty from the College of Agricultural Engineering to OSU for training on the project supported by the Ford Foundation since 1964. Eight received an advanced degree, mostly Ph.D. and two were special short term trainees. This training in Agricultural Engineering was closely coordinated with and it was complementary to the training on the OSU/AID program.

Both the PAU and HAU would like to continue to send some of its faculty to U. S. for advanced and special training and every effort is being made to facilitate financially some of this. There are many weak areas in both institutions (more so in HAU) where this training would be highly beneficial to the development of those areas of the University.

Table 6. Indian Faculty Trained From Ludhiana or Punjab Agricultural University according to Subject Matter Area - 1955-1973, in U. S.

<u>Subject Matter Area</u>	<u>Number Trained</u>	<u>Location if Left PAU</u>
1. Agronomy	10	1 at FAO 1 in U. S. A. 1 at International Institute, Hyderabad
2. Soil Science	3	1 at FAO
3. Forage Crop Production	1	1 at HAU
4. Horticulture	2	
5. Botany	1	
6. Plant Genetics	1	
7. Plant Pathology	3	
8. Citrus Virology	1	
9. Biochemistry	3	
10. Food Processing & Technology	2	
11. Poultry Science	2	1 Business
12. Dairy Science	6	1 at HAU 1 in U.S.A.
13. Animal Breeding	1	
14. Veterinary -Anatomy	1	
15. Veterinary -Medicine	1	
16. Agricultural Engineering	3	1 Himachal Pradesh Univ.
17. Farm Management	2	1 at FAO
18. Agricultural Economics	4	
19. Home Science	4	
20. Agricultural Extension	1	
21. Communications	1	
22. Library Science	1	
Total	54	10

Table 7. Indian Faculty Trained From Hissar or Haryana Agricultural University
According to Subject Matter Area, 1955-1973, in U. S.

<u>Subject Matter Area</u>	<u>Number Trained</u>	<u>Location if left HAU</u>
1. Veterinary - Anatomy	2	1 U.S.A.
2. Veterinary - Bacteriology	1	
3. Veterinary - Microbiology	1	
4. Veterinary - Food Hygiene	1	1 PAU
5. Veterinary - Medicine	2	
6. Veterinary - Obstetrics & Gynecology	1	
7. Veterinary - Parasitology	2	
8. Veterinary - Pathology	2	
9. Veterinary - Pharmacology	2	1 PAU
10. Veterinary - Physiology	4	2 unknown 1 PAU
11. Veterinary - Surgery	2	1 Punjab State Govt.
12. Animal Science - Sheep	1	1 PAU
13. Animal Science - Swine	1	1 unknown
14. Animal Nutrition	3	2 PAU 1 Haryana State Govt.
15. Dairy Science	2	
16. Animal Breeding	1	1 Rajasthan State Govt.
17. Dairy Technology	1	
18. Genetics - Radiation	1	
19. Biostatistics	1	
20. Entomology	1	
21. Nematology	1	
22. Food Science	1	
23. Agronomy	5	
24. Soil Science	1	1 unknown
25. Viticulture	1	
26. Plant Pathology	1	
27. Extension Education	1	
Total	43	14

F. LIBRARY MATERIALS, EQUIPMENT AND SUPPLIES PROVIDED

Under the OSU/AID contract, library books, laboratory equipment and supplies were provided from the United States by The Ohio State University to support the program for development of the Universities. These materials could not be purchased in India, but were considered essential for the program.

From 1964-73, The Ohio State University purchased and shipped \$153,983 of books, equipment and supplies to PAU and HAU with a very small amount going to the Palampur Campus of the Agricultural Complex of the Himachal Pradesh University. About three times this much or about \$450,000 of such items had been shipped on the regional program 1955-64 to the various elements or colleges which later became a part of these Universities. This made a total of about \$604,000 of these items over the 18 years.

About 900 books were sent to PAU and HAU from 1964-73, on the University contract. These combined with those shipped on the regional contract made a total of about 3800 books for these institutions provided by the OSU/AID contracts during the last 18 years.

About 500 major items of equipment were purchased and shipped by The Ohio State University to PAU and HAU and Palampur Campus of Himachal Pradesh from 1964-1973. This added to about 2000 items sent from 1955-64 made a total of about 2500 major items of equipment provided over the 18 years. Besides these major items thousands of repair parts and small items were sent, especially the last few years. The need for these repair parts became very important in order to keep the equipment usable that had been provided previously. This became a time consuming job for the Chief of Party in India and the campus coordinator and others at The Ohio State University to describe, purchase, ship and receive these items.

Besides all of these materials purchased and shipped, many books, journals, and publications were sent as gifts to the Universities over the years from The Ohio State University, the Ohio Cooperative Extension Service, the Ohio Agricultural Research and Development Center, and many individuals including OSU faculty who were especially interested.

It is very difficult to measure directly the benefits of these materials, but it is evident that the faculty and the University considered these highly beneficial. Initiation of many research projects, extension projects, and various phases of the teaching program at the Universities could not have been done without these materials. Certainly many other phases of the work could not have been conducted as well as they were if these materials had not been made available.

A good example of this was the equipment sent for the Toxicology Laboratory development at PAU which Dr. Harvey Krueger, an OSU faculty member, was assigned to help develop in 1967-69. This is now an outstanding laboratory in all India serving a very important need.

G. DEMONSTRATION AND DEVELOPMENTAL PROJECTS SUPPORTED FROM RUPEE TRUST FUNDS

An important factor in the success of the OSU faculty who were assigned to India was the projects with which they were directly associated whereby

they could demonstrate and initiate development of various aspects of teaching, research, and extension. These projects were developed and managed cooperatively by the OSU faculty members and India faculty members. They were financed at least in part with rupees provided by the USAID mission from Trust Funds.

The projects consisted of both (a) long term, large projects - usually for 1 or 2 years, and (b) short term, small projects - usually for 1 to 12 weeks. The long term projects involved a substantial budget from the Trust Fund as well as from the University and they were approved by the OSU faculty member and Chief of Party, by the Indian University, the US/AID Mission and the Indian Council of Agricultural Research. Small projects, not exceeding 2500 rupees could be approved by the OSU Chief of Party with the concurrence of the Indian University and the USAID Mission and were designed usually to assist with conferences, workshops or seminars, or with very specific short term projects under the guidance of the OSU faculty member.

These projects made the difference with many of the OSU faculty as to whether or not they were able to do many things. These were not the only projects with which the OSU faculty worked. However, often finances were not available from the Indian Universities or any other source in order to carry on demonstrations or to initiate development of new and improved programs. After the projects had demonstrated the value of the program, the University or State, in many cases assumed the financing and carried forward with them. Evidence is clear that these projects made significant and lasting contributions to the growth and development of the Universities and to the improvement in the quality and capacity of the faculty and administrators. Research facilities were improved, meaningful research programs were initiated, teaching laboratories and methods were improved, and extension educational methods and programs were initiated and demonstrated.

A listing and explanation of each of these projects is presented in Table 8. Eight long term large projects were conducted at Ludhiana (PAU) and one at Hissar (HAU) from 1963 to 1973. A total of 14 short term small projects were conducted at Ludhiana, 4 at Hissar, and one at Simla - the latter a seminar for those Indians in the whole area who had returned from U. S. training. The total budget for these projects from 1964 to 1973 was 1,759,101 rupees, with 1,276,601 at Ludhiana, 442,500 at Hissar, and 40,000 for the returned trainees seminar in the whole area.

Much more detailed reports were made on these projects in the regular OSU Faculty Reports and in the OSU annual program reports. The accomplishments in every case was considered valuable. These played an important role in stimulating development of the various aspects of the University. They provided incentives and challenges for both OSU and Indian faculty and the OSU faculty, therefore, had a more satisfying work experience in India.

Table 8. Demonstration and Developmental Projects Supported from Rupee Trust Funds, Punjab Agricultural University and Haryana Agricultural University - 1963-1973.

<u>Year Initiated</u>	<u>Project Title</u>	<u>OSU Advisor/ Consultant</u>	<u>Length of Term</u>	<u>Budget Rupees*</u>	<u>Principal Objectives and/or Contribution.</u>
LONG TERM PROJECTS					
<u>(a) The Ludhiana Campus - PAU</u>					
1963	Sprinkler Irrigation Demonstration	H. R. Capener R. E. Yoder	Two years	27,680.00	To demonstrate the utility and effectiveness of Sprinkler Irrigation System.
1964	Two Years Master's Course in Poultry Science	A. R. Winter	Two years	250,000.00	To provide properly trained graduates in Poultry Science for Teaching/Research/Extension.
1964	Two year master's course in Farm Management	C. V. Moore N. R. Carpenter	Three Years	400,000.00	To provide properly trained graduates in Farm Management for Teaching, Research & Extension.
1966	Installation of computer service at PAU	W. B. Wood	Two Years	58,921.00	Installation of computer system for data processing.
1967	Research Methodology in Agricultural Economics	C. V. Moore	One Year	77,000.00	Training of post graduate students in Economics Research Methodology.
1967	Cafeteria Demonstration Project	E. R. Kaufman	One year	50,000.00	Improvement of kitchen/ eating facilities in Punjab Agricultural University Cafeteria.
1968	Establishment of Insecticides Residue Laboratory	H. R. Krueger	Two years	142,000.00	Initiation of research to establish residual levels of insecticides used on both plants and animals.

* 7.6 rupees per U. S. Dollar.

Table 8, continued.

<u>Year Initiated</u>	<u>Project Title</u>	<u>OSU Advisor/ Consultant</u>	<u>Length of Term</u>	<u>Budget Rupees*</u>	<u>Principal Objectives and/or Contribution.</u>
1970	Quality Evaluation of Wheat Lines early in the breeding program.	C. A. Lamb D. C. Abbott	2 years	106,000.00	To conduct research for improvement of Mexican Varieties of Wheat Lines in order to make them more acceptable to the consumer.
<u>(b) The Hissar Campus - HAU</u>					
1969	Forage Evaluation Laboratory	J. W. Hibbs	2 years	400,000.00	Development of laboratory facilities for research in forage evaluation and processing.
SHORT-TERM PROJECTS					
<u>(a) The Ludhiana Campus - PAU</u>					
1965	Workshop of Agricultural Universities	W. B. Wood	One week	25,000.00	Meeting of Agricultural Universities from all India for mutual consultations.
1967	Farm Machinery Demonstration Project	R. E. Yoder	3 months	30,000.00	To strengthen workshop facilities for maintenance of Farm Machinery.
1967	Procurement of Library Books	C. V. Moore	3 months	25,000.00	To equip departmental library in the Department of Economics and Sociology.
1967	Printing of Bulletin	C. V. Moore	3 months	8,000.00	Printing of bulletin based on Ph.D. thesis by Dr. K.S. Mann, OSU training participant, on research and extension type demonstration projects by PAU.

Table 8, continued.

<u>Year Initiated</u>	<u>Project Title</u>	<u>OSU Advisor/ Consultant</u>	<u>Length of Term</u>	<u>Budget Rupees*</u>	<u>Principal Objectives and/or Contribution.</u>
1969	Returned participants seminar at Simla. From Ludhiana, Hissar & Others	C. A. Lamb	One week	40,000.00	To exchange ideas and consultations between University administrators and Indians returned from U. S. training under the Contract Program.
1970	Pulse Workshop for all India	C. A. Lamb	One week	2,500.00	Provision of supplies and printing of proceedings of the Indian Pulse Breeders.
1970	Convention of Indian Agricultural Universities & workshop.	C. A. Lamb	One week	40,000.00	Meeting of Indian Agricultural Universities Administrators for Mutual consultations.
1971	Publication of a Technical Bulletin on Citrus Decline	L. C. Knorr	One year	25,000.00	Publication of illustrated bulletin on "Citrus Decline in India-Causes and Control" for Research and extension use.
1971	Shamianas and Tents for the Kisan Mela (Field Days)	C. A. Lamb	One week	2,500.00	To demonstrate latest farming practices to the farmers participating in the Kisan Mela (Field Days)
1971	Arranging competitions for Home Crafts	C. A. Lamb	One Week	2,500.00	To demonstrate various Home Crafts at Field Days.
1971	Demonstration in educating farmers and farm ladies about balanced and nutritive food.	C. A. Lamb	One Week	2,500.00	To demonstrate balanced diets and nutrition at Field Days to farmers and families.
1971	Competition of produce of crops, vegetables & fruit	C. A. Lamb	One Week	2,500.00	To demonstrate latest production practices of crops, vegetables and fruits to the farmers participating in the Kisan Mela - Field Day
1971	Ploughing competition	C. A. Lamb	One Week	2,500.00	To demonstrate improved ploughing practices at the Field days.
1971	Competitions of Rural Sports	C. A. Lamb	One Week	2,500.00	To demonstrate sports and recreation for rural people at Field Days.

Table 8, continued.

<u>Year Initiated</u>	<u>Project Title</u>	<u>OSU Advisor/ Consultant</u>	<u>Length of Term</u>	<u>Budget Rupees*</u>	<u>Principal Objectives and/or Contribution.</u>
1971	Education & cultural program	C. A. Lamb	One week	2,500.00	To demonstrate special educational and cultural programs at field days.
<u>(b) The Hissar Campus - HAU</u>					
1968	Research developments in genetics	C. A. Lamb	3 months	30,000.00	Visits by international Geneticists for lectures and consultations with staff and students of recent development in Genetics.
1971	Oenology Seminar (Wine Production)	C. A. Lamb	One week	7,500.00	Invitational visit by Dr. Ralph Kumkee, lectures and seminars on wine production.
1972	Modern Poultry Processing Techniques	P. C. Clayton	One month	2,500.00	To demonstrate and train staff and students in Poultry Processing Techniques and marketing.
1972	Modern Turkey Processing Techniques	P. C. Clayton	One month	2,500.00	To demonstrate and train staff and students in Turkey Processing and Techniques.

H. STUDENT, FACULTY AND FARMER EXCHANGE - OSU, PAU, HAU, OHIO, PUNJAB, HARYANA

An OSU study abroad program for OSU undergraduate and graduate students was initiated in 1969-70 at The Punjab Agricultural University. This is continuing for the fifth year, 1973-74. To date 10 undergraduate and 2 graduate students have spent from 7 to 10 months at PAU.

The understanding and relationships between PAU and OSU are such that OSU has accepted nearly all credits earned at PAU. This program is self-financed by the students, and is not a part of the OSU/AID contract program. It originated as a result of the relationships which had been developed by the OSU/AID program.

Ohio State University continues to have a number of advanced Indian students from the Punjab Agricultural University and Haryana Agricultural University. It is hoped that student exchange programs can continue. However, in most cases Indian students will need to have financial support. Likewise, it is hoped that faculty exchange can take place between OSU and the Indian Universities.

A farmers' exchange program between Ohio and Punjab/Haryana was started in 1971. This was another program originating from the relationships which had developed as a result of the OSU/AID Contract program. During July and August of 1971, thirteen Indian farmers from Punjab and Haryana States, were hosted by some 35 Ohio farm families. In 1972 again 6 Indian farmers were hosted by about 15 Ohio farm families. It is expected that some Ohio farmers will pay return visits to Punjab and Haryana. This program is self-financing and was not a part of the OSU/AID contract program. It has considerable educational and international relations value.



OSU students who have studied at the Punjab Agricultural University in the last 5 years, 1969-1974. (In some cases picture includes OSU Administrative personnel, Dean Roy M. Kottman and Dr. Mervin G. Smith)

IV. THE PUNJAB AGRICULTURAL UNIVERSITY IN 1973

A. GENERAL FUNCTIONS

The Act of 1961 by the State of the Punjab creating the Punjab Agricultural University empowered the University (a) to provide graduate and postgraduate instruction in agriculture, veterinary and animal science, agricultural engineering, home science, allied sciences and in other branches of learning as the University may deem fit (b) to conduct research related to the above fields, and (c) to disseminate research and technical information through a program of extension education. Thus, the University was initially made responsible for the three functions of teaching, research and extension education in agriculture and allied fields for the State of the Punjab.

B. ORGANIZATION AND ADMINISTRATION

To fulfill these three functions, the University has five Colleges and three directorates. The Colleges are Agriculture, Agricultural Engineering, Basic Sciences and Humanities, Home Science, and Veterinary Medicine, each headed by a dean. These five colleges are comprised of 31 departments with 970 staff members in position performing all functions.

The Universities' administrative organization consists of a Vice-Chancellor, Director of Post graduate instruction, Director of Research, Director of Extension Education, Deans of the Colleges, and Heads of the Departments. Staff positions are established for the registrar and controller. Other positions are Librarian, Director of Student Welfare, Chief Engineer and Senior Architect. The administrators for the University during 1973 are given in Table 9.

A unique feature of PAU in contrast to many other Indian agricultural universities is its decentralized administrative organization and procedures. Because of his other responsibilities at the State Capital, Chandigarh, situated some 60 miles from Ludhiana, the Vice-Chancellor spends only part-time on the University Campus. He has established a large number of permanent committees, comprised of selected administrators, each committee being chaired by a designated top-level administrator, and each having clearly assigned responsibilities for the most important, continuing university programs/functions. The Vice-Chancellor coordinates the work of these committees. The actions and recommendations of the committees are presented to the Vice-Chancellor for approval and related decisions. The Directors of Research and Extension Education and the Dean of Post Graduate Studies, along with the Deans of the colleges and the Chief Engineer, play major roles in the functioning of these committees.

There are at least two principal advantages of this administrative pattern. First, by distributing his work load and divesting himself of daily details, the Vice-Chancellor reserves badly needed time to consider the most important issues pertaining to the welfare and future of the Institution. Second, a number of highly capable administrators are provided an opportunity to share in

reviewing the status and needs of the various segments and programs of the University and in making recommendations for their improvement. Also over time, younger administrators gain experience as they become involved in the work of the committees. As the result of this decentralized approach, the University has developed both quantity and quality of administrative talent, thus providing assurance that the University would continue to move forward even during times of administrative shifts.

Table 9
Officers/Faculty of the Punjab Agricultural University
During 1973

Chancellor:	Dr. D. C. Pavate, Governor, State of Punjab
Vice-Chancellor:	Dr. M. S. Randhawa, D.Sc. FNI, ICS ((Retd.))
Director of Extension Education:	Dr. A. S. Dhillon
Director of Research:	Dr. Sukhdev Singh, replaced by Dr. N. S. Randhawa
Dean, Post Graduate Studies:	Dr. K. Kirpal Singh
Joint Director of Research:	Dr. J. C. Bakshi
Joint Director of Information and Communication:	Dr. Mulwant Singh Virk
Registrar	Mr. H. S. Aujla
Comptroller	Mr. H. R. Bali
Chief Engineer cum Estate Officer:	Mr. B. S. Grewal
Librarian:	Mr. T. P. Saxena
Senior Architect:	Mr. H. S. Chopra
Director Students Welfare:	Mr. Prithipal Singh

College of Agriculture

Dr. A. S. Atwal, replaced by Dr. Sukhdev Singh	Dean	
Dr. K. S. Gill	Professor & Head	Plant Breeding
Dr. K. S. Nandpuri	" "	Horticulture
Dr. N. S. Randhawa, replaced by Dr. G. S. Sekhon	" "	Soils
Dr. O. S. Bindra	" "	Zoology Entomology
Dr. G. S. Gill	" "	Agronomy
Dr. Dalbir Singh	" "	Animal Science
Dr. J. S. Chohan	" "	Botany & Plant Pathology
Dr. Raghbir Singh	" "	Extension Education
Dr. G. S. Bains	" "	Food Science & Technology

College of Basic Sciences and Humanities

Dr. A. S. Kahlon	Dean		
Dr. I. S. Bhatia	Professor and Head	Chemistry Biochemistry	
Dr. S. S. John	" "	Economics & Sociology	
Dr. K. S. Gill	" "	Genetics	
Dr. D. Raghavarao	" "	Mathematics & Statistics	
Dr. Mohan	" "	Languages	
Dr. D. S. Chahal	" "	Microbiology	
Dr. M. C. Kapur	" "	Business Management	

College of Agricultural Engineering

Dr. C. M. Jacob, replaced by			
Dr. B. S. Pathak	Dean		
Dr. B. S. Pathak	Professor and Head	Agricultural Engineering	
Dr. S. K. Vyas	" "	Civil Engineering	
Dr. K. D. Mannan	" "	Mechanical Engineering	
Dr. M. S. Sikri	" "	Electrical Engineering	

College of Home Science

Dean S. Dantiyagi, Replaced by			
Dr. Satinder Bajaj	Dean		
Dr. K. K. Sharma	Professor and Head	Nutrition	
Dr. J. K. Dhesi	" "	Home Management	

College of Veterinary Medicine

Dr. Ajit Singh	Dean		
Dr. B. S. Paul	Professor and Head	Vet. Pharmacology	
Dr. S. S. Dhillon	" "	Medicine and Clinics	
		Vet. Bacteriology and	
		Parasitology	

The continued success of this administrative scheme is dependent upon the ability of the Vice-Chancellor to maintain constant vigilance of the internal working of the University, to be aware of stresses and strains at all levels, and to maintain an open channel of communication with the faculty members and their respective units.

C. INTEGRATION OF TEACHING/RESEARCH/EXTENSION

Under the present organization, the College Deans are responsible for the teaching of their respective units and have no assigned supervisory authority over research and extension education. However, the Deans are members of committees which review and approve the research and extension education programs which involve their respective colleges and faculty. Opinions vary within the University as to the degree of effectiveness with which these committees function. The weight given to the deans' judgements in the deliberations appears to vary with the personalities involved.

The Department Heads are responsible to the Director of Research for research, to the Director of Extension Education for extension activities, and to the College Dean for the degree instructional programs.

At an earlier date, the University considered the desirability of adopting the organization recommendations made by a Joint Study Team (T. S. Sutton from OSU, W. N. Thompson from the University of Illinois, and O. P. Gautam and J. S. Patel of the Indian Council of Agricultural Research) and published in a book "An Assessment of Progress, Punjab Agricultural University", March 31, 1970. These were (a) the establishment of the post of Director of Resident Instruction to coordinate the teaching program of the institution, and (b) that the College Dean be responsible for integration of the functions of teaching, research, and extension education within his/her College. This possible reorganization and reassignment of integration responsibilities is still being discussed within the University. However, the impression gained is that either (a) the implications of these recommendations are not clear, and/or (b) many administrators prefer to retain the present system.

Integration of teaching, research, and extension education is being achieved effectively within the University, although the level of achievement varies between departments. In large measure, the department heads are mature and capable administrators, who have pride in their responsibility to integrate these three functions. Staff members are required to perform services in at least two of the functions; a requirement which is generally adhered to and which makes possible efficient use of the available talent.

The integration of programs in the University is intimately related to inter-disciplinary practices involving inter-department and inter-college programs in teaching and research. The College of Basic Sciences/Humanities is functioning well as a service arm of the other colleges and, in addition, is turning attention to programs related specifically to its fields of specialities. Within other colleges/departments, there are a number of programs in progress which could be strengthened by greater use of inter-disciplinary approaches.

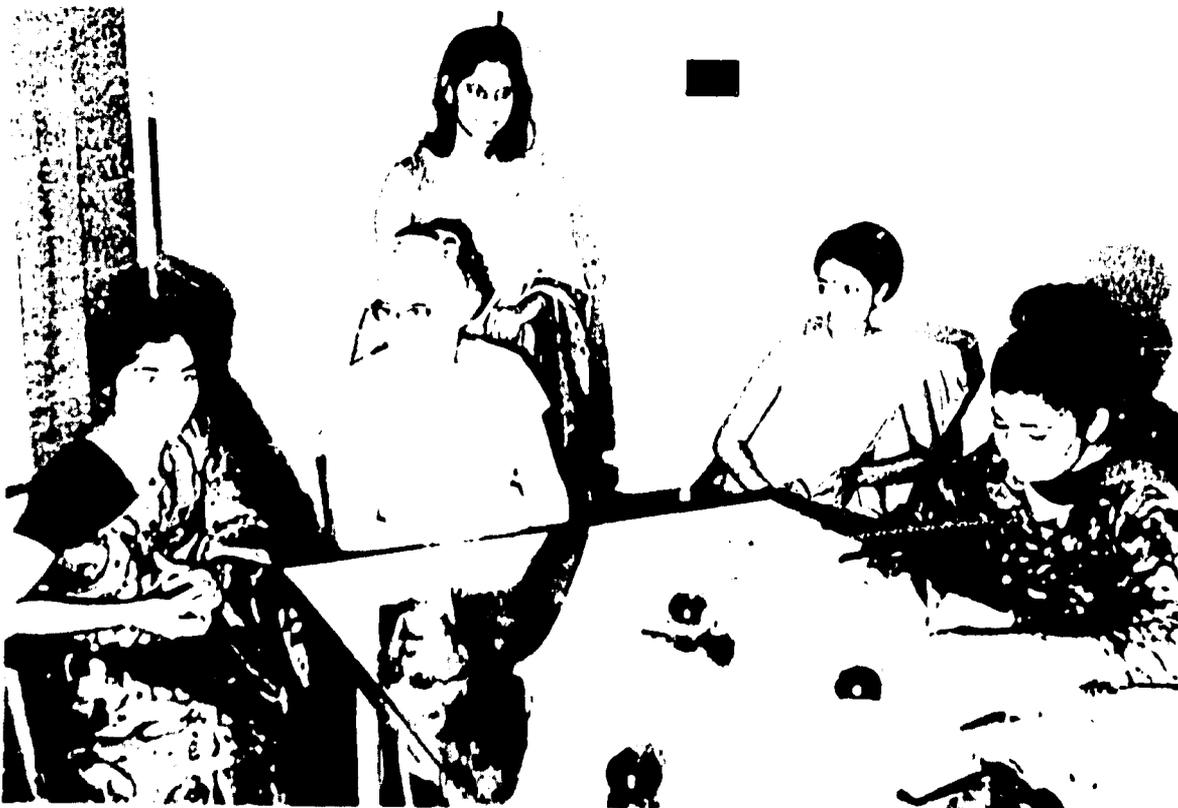
D. THE PHYSICAL PLANT

Throughout its lifetime the Punjab Agricultural University has been blessed with substantial financial support, able leadership, and a relatively sound campus development plan by which it has continuously improved its physical facilities.

The new headquarters for the College of Basic Sciences and Humanities was completed in 1972; the Central Library Building was also completed; additional



First Home Science Class at PAU, 1967.



PAU Home Science Faculty with OSU Professor Maria Friesen, (center)

lodging facilities were made available recently for faculty/employees and more are planned, and the comprehensive Veterinary Science Complex is about completed.

Within the last few years, construction was completed on the Student Home, Teacher's Hostel for unmarried female teachers, Lecture Theater, Animal Sheds, and additional tubewells. Improved facilities were also in process for animal science and horticulture. About 140 residential houses have been completed and made available.

The Food Science and Technology Buildings for horticultural and dairy products were completed just recently.

The Library, constructed at a cost of over 40 lakhs of rupees (one lakh = Rs. 100,000) can accommodate 250,000 books, has reading room space for 760 persons, and includes 50 cubicles for individual study. The Library is equipped with a complete reprographic unit including microfilm and other duplicating facilities.

A Museum for Social History of the Punjab has been constructed on the campus. A replica house was built for this Museum donated by private organizations. The Museum portrays agriculture and life in the Punjab during the eighteenth and nineteenth centuries.

The PAU campus buildings and grounds are impressive. As a whole, the buildings are well-designed, properly spaced, yet located so that the students have limited distance between the major centers of learning. The grounds are effectively landscaped and special flower gardens are being developed. Additionally, a sense of good housekeeping prevails throughout the University; the buildings are well-maintained and the buildings and grounds are neat and attractive.

As it looks to the future, the University could well afford to re-examine its Campus Development Plan and make such modifications and additions as may be dictated by the anticipated requirements for the next five years. As a prerequisite to this, the University needs to give attention to further development of long range academic plans from which the future construction needs may be projected.

E. FINANCIAL RESOURCES

Throughout its history, the Punjab Agricultural University has received strong financial support from the public sector, with the State Government the principal contributor. The sources and amounts of grants received by the University during the 1967-1972 period are presented in Table 10.

The State Government portion, the major share, of the grants was 70.3% in 1971-72 with the Indian Council of Agricultural Research (I.C.A.R.) also being a substantial contributor. Grants were also received from P.L. 480 funds, Ford Foundation, University Grants Commission, and other Central Government Agencies. During the five-year period, the total grant support fluctuated from nearly Rs. 315 lakhs (4.15 million dollars) to Rs. 408 Lakhs (5.37 million dollars) with the variation reflecting the extent of State support.

Table 10. Total Grants Received by the University from Various Schemes for the Period 1967-1972.

Rupees in Lakhs*					
	<u>1967-68</u>	<u>1968-69</u>	<u>1969-70</u>	<u>1970-71</u>	<u>1971-72</u>
1. State Government	289.73	231.23	329.19	204.73	265.27
2. Indian Council of Agricultural Research	59.83	77.82	68.15	108.67	86.00
3. P. L. 480	5.52	4.40	4.21	1.58	2.45
4. Ford Foundation	0.13	0.08	2.21	2.69	1.15
5. Universities Grants Commission	--	---	0.15	0.01	--
6. Government of India	6.42	1.51	4.61	1.96	5.14
Total	<u>361.63</u>	<u>315.04</u>	<u>408.52</u>	<u>319.64</u>	<u>360.01</u>

*7.6 rupees equals one dollar. 1 lakh is 100,000 rupees.

The expenditures of the University for the different program functions and supportive categories for 1969-70 and 1970-71 is shown in Table 11:

Table 11. Expenditures at PAU for Program Functions and Supportive Categories in 1969-70, 1970-71.

<u>Function and Categories</u>	<u>1969-70</u>	<u>1970-71</u>
	Lakhs*	Lakhs*
Research	158.38	99.40
Teaching	112.44	112.13
Extension	35.74	29.78
<u>Supportive Categories</u>		
Administration	55.72	32.71
Building	45.15	31.62
Maintenance	5.57	6.00
Total	<u>413.00</u>	<u>311.34</u>

 * 1 Lakh = 100,000 rupees 7.6 rupees = \$1.00

The cause(s) for the decrease in support in 1970-71 can not be accurately ascertained. It is possible, however, that the bifurcation of PAU to produce the Haryana Agricultural University, which occurred in February, 1970, may have been a factor.

These figures reveal the relatively large amount of funds for teaching and research in comparison to those for extension education. It is likely, however, that the budget for the first two program functions subsidize extension activities by providing salaries for teachers/research workers who give part-time to extension programs.

The foregoing information supports the conclusion that PAU is being provided adequate support to maintain its present standing and to engage in at least modest but continuing improvement and expansion programs. If an academic plan of the institution for the future is fully developed it will then be possible to identify more precisely the high priority financial needs of the institution as it moves into the future.

F. TEACHING

The number of students at Punjab Agricultural University has increased nearly every year since the University was founded in 1962. The number enrolled for 7 years from 1965-66 to 1971-72 is indicated by colleges in Table 12 and the number admitted and graduated in each area is presented in Table 13.

The College of Agriculture and the College of Basic Sciences and Humanities started from the beginning. Enrollment in agriculture since 1965 has been increasing only slightly and seems to be stabilizing at about 1300. There has been some restrictions in enrollment in the country.

Table 12. Punjab Agricultural University Enrollment
(Fall Trimester 1965-66 - 1971-72)

	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72 Estimate
<u>COLLEGE OF AGRICULTURE:</u>							
Undergraduate	821	944	879	904	970	1002	1010
Post-Graduate	263	277	349	290	155	241	318
Total	1084	1221	1228	1194	1125	1243	1328

<u>COLLEGE OF BASIC SCIENCES & HUMANITIES:</u>							
Undergraduate	--	--	--	--	--	50	50
Post-Graduate	71	150	142	119	279	173	216
Total	71	150	142	119	279	223	266

<u>COLLEGE OF AGRICULTURAL ENGINEERING:</u>							
Undergraduate	115	221	231	267	241	200	157
Post-Graduate	-	-	-	-	12	12	24
Total	115	221	231	267	253	212	181

<u>COLLEGE OF HOME SCIENCE:</u>							
Undergraduate	-	25	54	83	131	189	227
Post-Graduate	-	-	-	-	-	18	36
Total	-	25	54	83	131	207	263

<u>COLLEGE OF VETERINARY MEDICINE:</u>							
Undergraduate	-	-	-	-	-	125	123
Post-Graduate	-	-	-	-	-	24	36
Total	-	-	-	-	-	149	159

<u>GRAND TOTALS:</u>							
Undergraduate	936	1190	1164	1254	1342	1566	1567
Post-Graduate	334	427	491	409	446	468	612
Total	1270	1617	1655	1663	1788	2034	2179

The College of Basic Sciences and Humanities has been the important service college to other colleges with about 40 percent of its courses provided to students in other colleges. It has only a few undergraduate students, but a substantial number of postgraduate students which have been increasing slowly.

The College of Engineering started about 1964 and reached a peak in numbers of students about 1968-69. In the last few years the number of new admissions of engineering students in India has been restricted. A postgraduate program was started in 1969.

The College of Home Science was started in 1966 and has had a steady increase each year. Postgraduate students were admitted first in 1970. There have been no restrictions on admission in Home Science.

The College of Veterinary Medicine was started in 1970 after the bifurcation of Punjab and Haryana and some of the faculty and students moved from the College of Veterinary Science at Hissar to Ludhiana. It was very short of facilities until the present completion of the new Veterinary College buildings. It is expected to have some increase in enrollment in the next few years.

About 28% of the total enrollment at PAU in 1971-72 was post-graduate students. This percentage has been nearly 30% about every year.

Only a few students have specialized in Animal Science in the College of Agriculture. Generally in India, Animal Science as a program separate from Veterinary Science has not been accepted. With greater interest now in livestock programs in India, the situation may change to permit Animal Science to be developed in its own right as an identified profession.

Admission of students to the University is restricted as to numbers of students. They are selected on the basis of examinations. In 1971-72 there were 2,421 admission applications and 740 were admitted. About 50 to 60 of the total student body are foreign students nearly all from other Asian countries.

Table 13. Students Admitted and Graduated in Punjab Agricultural University - 1971-72.

	<u>Admitted</u>	<u>Graduated</u>
<u>UNDERGRADUATE</u>		
Agriculture	257	227
Agricultural Engineering	56	102
Home Science	71	28
Veterinary Science	39	38
Honors Program	49	0
Total Undergraduates	<u>472</u>	<u>395</u>
<u>POST-GRADUATE</u>		
M. S.	211	120
Ph.D.	57	15
Total Post-Graduate	<u>268</u>	<u>135</u>
<u>TOTAL ALL STUDENTS</u>	740	530

Curricula/Course Improvements

The responsiveness of the University to the needs of the student, state, and India is reflected in the new curricula and course programs which have been initiated within the past few years. The improved and new programs include the following.

The University established the Department of Business Management, in the College of Basic Sciences/Humanities, to make available instruction in the principles and application of management methods and techniques. This will provide the students with a background for subsequent employment in agribusiness and related fields. The Master of Business Administration (Agriculture) program was started in 1972.

A Master of Science Degree program in Agricultural Education was initiated in the College of Agriculture to provide qualified teachers for agricultural schools administered by the Education Department of the State.

In view of the pressing need for greater efficiency in the use of water resources, the College of Agricultural Engineering is now offering Ph.D. programs in Soil and Water Management.

There is an increasing opportunity for graduates well trained in landscape architecture. Consequently, landscaping and floriculture have been introduced as major fields of specialization for the Master of Science Degree.

An Honors Program was started in 1971 with 49 enrolled the first year. This overlaps particularly in the College of Basic Sciences/Humanities and the College of Agriculture. It includes students in such subjects as

Botany, Zoology, Chemistry, Biochemistry and Statistics.

Teaching Improvement

The Punjab Agricultural University is striving constantly to improve its teaching and its teachers. The University's goal appears to be to make fully operative and effective the teaching concepts adopted from the Land-Grant Universities in the United States - which include (a) total faculty responsibility for instruction and evaluation, and (b) use of internal examinations. In large measure, this goal is being achieved. However, it has been reported that an appreciable number of the instructors (probably as many as 30 percent) continue to use dictation as the form of teaching, thus continuing with the traditional rote system of learning. If such reports are valid, then this offers a fertile field for improvement to which the University will want to give attention.

In an effort to improve both teaching and teachers, the University was engaged in two in-depth teaching seminars; one held June 23-26, 1971, and the second December 28-29, 1971. In the latter program, sponsored jointly by the Indian Council of Agricultural Research and USAID, considerable attention was given to the employment needs and requirements of graduates and how the curricula, teaching and evaluation should be geared to prepare the students for expanding career opportunities.

G. RESEARCH

In the previous section on University Finances, reference is made to the substantial portion of the budget which is allocated for research. In fact, about 40 per cent of the annual budget is spent on applied and fundamental research in agriculture and allied sciences.

At the time of its inception, the University was granted 1200 acres of land essentially adjacent to the Ludhiana campus. This provided the University with the land needed to embark upon a well rounded research program and, also, to obtain supplemental income from the crops produced. The University has expanded its research and development program and now has five regional and five sub-stations which make possible research designed to suit the needs and conditions of every segment of the State. In addition, the University has a seed-production farm of 385 acres at Naraingarh and about two years ago it received from the State Government another farm (the Ropar Farm), totalling 1000 acres, for research and seed production.

The research program of PAU over the years has been highly productive. The program is noteworthy because it has been problem oriented and highly relevant to the existing and projected needs of Punjab's agriculture. The University has been blessed with a significant number of highly competent, progressive-minded research leaders and scientists who possess the capability of planning and executing timely research projects and bringing them to the application stage. Among the effective research and development programs are

those in plant breeding, weed control, plant protection, and agricultural engineering. The following examples will serve to illustrate some of the more recent research/development achievements:

1. The development of a new 2-gene, rust tolerant dwarf variety wheat (WB-357) with high yield potential and good chapatti making qualities. Released to farmers during 1972.
2. The development of a short duration rice variety (PIR-579) which ripens in 125 days, has a yield potential of 7 tons/hectare and good grain and cooking quality.
3. The development and release of an early maturing, high yielding variety of maize (Bhodipur white) and another variety (Rotton) having high lysine content.
4. The development and release of a new American cotton variety (J-205) having a 19 per cent higher yield than the standard variety and superior lint quality. Field tests completed and release was recommended in 1971.
5. The development and release of a new variety of ground nut (E-148) having good adaptability and high yield potential under water stress and high fertility.
6. The finding that soil application of Gamma BHC increased sugarcane production by about 44 per cent.
7. The release of three important varieties of tomatoes, the Bonneville variety of peas, and the Shipper variety of watermelon.
8. The use of polythene bags for forcing of vegetables and advancing the date of their planting.
9. Control of flag smut of wheat by treating the seed with selected fungicides, permitting an increase in net income to the extent of Rs. 500/hectare.
10. Control of certain obnoxious weeds in wheat, accomplished by the use of carefully selected herbicides.
11. Development of a new strain of meat-type chicken with performance equivalent to commercial broilers in the United States.
12. The development of successful proto-types of front-mounted, tractor-operated reaper and digger for wheat and potato, respectively. This equipment is now being manufactured commercially.
13. Promoted the use of bullock-drawn disc harrow to replace the country plow, based on findings that this disc harrow reduced seedbed preparation time by 40-50 per cent.

Although the above examples provide evidence that the research program at PAU is contributing substantially to agricultural production, there are some important areas in the University which have not been provided adequately trained manpower and/or facilities to conduct much-needed research. This

points up the necessity for the University to continue to develop and review its academic plan at an early date so that proper attention may be given to these handicapped units. Furthermore, the matter of duplication of research in some areas justified consideration, particularly as it involves plant breeding, agronomy, soils and agricultural engineering. Interdisciplinary approaches could lead to the elimination of duplication, and more efficient use of personnel, laboratory space, land, and financial resources.

In contemplating the future requirements for Indian agriculture, PAU will be seeking alternatives to its present concentrated interest in cereal grains. This may necessitate a planned shifting of resource utilization to livestock research/development, such as dairy, swine, sheep, and goats. Furthermore, a marked increase in problem-solving processing, marketing and distribution research is fully justified under the prevailing conditions where huge losses of crops occur due to inadequate preservation practices, storage and transportation facilities, and distribution systems.

H. EXTENSION EDUCATION

To a remarkable degree, the Punjab Agricultural University has played a significant role in the large and rapid agricultural development in the State and in making possible the present dominant position of the Punjab as a crop producing state. By means of a sound progressive, and integrated extension education program, the Extension Directorate has continuously bridged the gap between research findings and practical application through a variety of extension education activities. Research and development results obtained in plant breeding, agronomy practices, water/soil management, plant protection, animal production, and engineering have been disseminated promptly to the cultivators. The success of the extension education endeavors is evidenced by the receptiveness of the cultivators to new ideas and by the extent and rapidity with which they adapt the proposals for change.

A strong feature of the extension program in the Punjab is the collaboration between the University and the State Government. By understanding how the State Government handles the functions of supply or services for the rural population, the University concerns itself essentially with training and education. The University maintains a close liaison with the State Departments of Agriculture and Animal Husbandry. Two Agricultural Officers Workshops are held each year to finalize a package of practices for the Kharif (wet season) and the Rabi (dry season) crops. The participants are officers of the State Department of Agriculture and University extension leaders and scientists. At these meetings, research findings are considered, mutually agreeable recommendations are determined, and these are published by the University in both English and Punjabi. By this approach, all extension workers in the State are disseminating the same information.

The integration of teaching, research and extension education at the Department level of the University adds great strength to the extension education program. In large measure, the Department Heads are extension oriented and accept the philosophy that research at PAU is of value only when the findings are put into practice by the cultivators. A strong, viable extension education

program is clearly visible in the departments where the Department Head is personally dedicated to the extension concept.

The Extension Directorate programs include the following: (a) Farmers Fairs (Melas) (b) Training courses for the farmers, and (c) Farm and Advisory Service.

The Farmers Fairs, (Melas) held on the Campus in March and September, are attended by thousands of farmers and their families. Demonstrations are arranged on improved crop production practices, new seed varieties, farm equipment, and in many other areas. The current publications on the package of practices is distributed, and question and answer sessions are held.

Approximately 120 training courses are held annually, with duration from one to twelve weeks. The courses cover a wide variety of subjects and are designed for the young and the old; for farmers, farm women, agri-business and government employees, and school teachers. In collaboration with the State Department of Agriculture and Development, farmers training programs are arranged at the block and village levels throughout the State.

To accommodate those who attend training programs at the campus, the University has constructed the Kairon Kisan Ghar Building, costing 15 lakhs of rupees, or \$225,000, which provides lodging/meals and meeting room facilities for 180 residents.

The Farm Advisory Service of the Extension Directorate of PAU resembles, in large measure, the Cooperative Extension Service system used by the Land Grant Universities in the United States. The principal function of the Service is to disseminate the latest information in all subject matter areas of interest to the rural population of the State and to assist the farmers in adopting recommended practices. This is accomplished by a core of Campus-based subject matter specialists and others stationed in local regions who fan out to the districts to provide on-the-spot advice/guidance to farmers and district-based specialists. Close cooperation with the State Government Departments is an essential element. Specialists are provided in agronomy, soils, farm management, extension education, horticulture, plant protection, farm machinery, and other areas.

The Farm Advisory Service also organizes a number of Demonstration Centers in each district for demonstrating the package of improved practices for cultivation of the different crops.

The excellent Communication Center of the University is a vital component of Extension Education. The printing and reproduction facilities and the related programs make possible rapid publication of timely leaflets, booklets, and technical briefs. These are used effectively by the Extension staff.

Very little off-campus extension programs exist in Home Science and Veterinary Medicine. However, the College of Home Science offers, annually, a variety of on-campus short-term information and training courses for village girls and women. Augmentation of the Home Science programs to include a formal section of extension education is worthy of the University's attention.

Because of changing agricultural conditions, the University will be justified in considering a more balanced extension program to include greater



USAID Administrator, John A. Hannah (center) visiting PAU, 1968.



U.S. Secretary of Agriculture, Orville L. Freeman, (r) visiting PAU in 1964.



Ohio U.S. Senator William B. Saxbe (center) visiting PAU, 1971. OSU Chief of Party Ira A. Gould (r).

emphasis on (a) livestock (especially dairy cattle management, milk production, and disease control), (b) marketing and distribution of farm produce, and (c) organized youth training activities.

As previously noted in this report, the University should continue to develop and review long-range academic plans. Such plans for Extension Education should be an integral part of the University's projections. Such plans should provide the Extension Directorate with sound guidelines for making adjustments essential for its future success.

I. SPECIAL ACTIVITIES-INDICATING DEVELOPMENT

The Punjab Agricultural University is gaining a reputation for its leadership in India and Asia in agricultural development. This is apparent by the number of all-Indian conferences and special seminars which it hosts and conducts each year. Its administrators and faculty have taken leadership in developing associations and special seminars. They have helped promote the Association of Agricultural Universities in India by hosting and strong participation in its conferences. In 1971-72 about 15 special seminars, workshops, institutes or symposiums were held on the campus at PAU on such subjects as Tropical Dairying, Dryland Farming, Oilseeds, Human Nutrition, Farm Machinery, Soil Fertility, and Teaching Methods. OSU faculty helped with many of these activities and often were key participants in them.

An increasing number of the administrators and faculty of PAU are receiving honors and special recognition for the outstanding work they have done, particularly in research. Many of the Indians who were responsible mostly for the outstanding achievements in research listed previously have been honored for their achievements. A number of the top administrators including the Vice-Chancellor has received many outstanding honors.

Another important activity which the PAU initiated a few years ago is the conferring of Honorary Degrees on outstanding Scientists and Leaders both from India and foreign countries. As an example, such honors have been bestowed on Dr. Norman E. Borlaug and Dr. Robert F. Chandler from the U. S. for International Cereal research leadership, and on Dr. Frank W. Parker and Dr. Ralph W. Cummings from the U. S. for outstanding consulting and assistance given to Indian Agricultural University Development. These activities bring recognition in turn to the Punjab Agricultural University and are stimulants to its own faculty and student development.

All of these activities are indications of a dynamic and progressive University.



l. to r. Vice Chancellor M. S. Randhawa, PAU; Pres. Novice G. Fawcett, OSU; Assistant Dean, Mervin G. Smith, OSU, 1969, at OSU.



PAU Executive Visitors at OSU with
M. G. Smith and C. A. Lamb of OSU
1969



Administrative Visit to OSU of
K. Kirpal Singh, PAU Graduate Dean,
1968

V. THE HARYANA AGRICULTURAL UNIVERSITY IN 1973

A. GENERAL BACKGROUND AND FUNCTIONS

The Haryana Agricultural University at Hissar was officially formed in February, 1970. From 1962 to 1970 this campus had been a part of the Punjab Agricultural University. It was started with the establishment of the College of Veterinary Science and Animal Husbandry in 1948.

In 1962 a College of Agriculture was started at the Hissar Campus. Then in 1966 a separate College of Animal Science was formed and Animal Husbandry was separated from Veterinary Science, which was renamed the College of Veterinary Science. Considerable land had been acquired with the campus from the large Government Livestock Farm at Hissar. The Ohio State University worked with the Colleges on this campus from the beginning of its program in 1955 in northwestern India.

In 1970 when the Haryana Agricultural University was formed it had about 2245 acres of land of which about 2100 acres were used for agricultural research and demonstrations and the remainder for the campus buildings. There were already four colleges: Agriculture, Veterinary Medicine, Animal Science and Basic Sciences and Humanities. The latter became a separate College upon bifurcation from PAU which had just one College of Basic Sciences and Humanities serving all three campuses of Ludhiana, Hissar and Palampur. Besides academic and farm buildings on the campus there were 5 hostels or dormitories for men students, a teachers' Home (or dormitory) and 358 houses for different categories of employees.

Fortunately when bifurcation took place, the Administrators and Faculty had previously experienced the development of an Agricultural University. Much of the background and philosophy of a land-grant type of institution had been developed. It was easy to continue the development of the Hissar campus into an Agricultural University.

There were serious physical and academic problems confronting the new university. Some of the existing departments suffered from shortages of quality and quantity of staff and from inadequate facilities; vitally needed colleges and departments were essentially non-existent. Important programs of research and extension were either greatly limited or missing entirely. Thus, the University was confronted with critical problems of personnel, space, equipment and programs.

The Haryana Agricultural University was established by a 1970 ordinance of the State of Haryana. The objectives in this ordinance were almost exactly the same as those stated in the Punjab Agricultural University Act in 1961 and the recommendations that had been made for all agricultural Universities in India. These objectives included (a) to provide graduate and post-graduate instruction in agriculture, veterinary science, animal science, home science and other allied sciences, and in such other branches

of learning as the University deem fit (b) to conduct research related to these same fields and (c) to disseminate research and technical information through a program of extension education.

B. ORGANIZATION AND ADMINISTRATION

To fulfill the three functions of teaching, research and extension education the University now has five colleges and three directorates. The Colleges are Agriculture, Veterinary Science, Animal Science, Home Science, and Basic Sciences and Humanities. These 5 Colleges have about 30 departments.

The University's administrative organization consists of the Vice-Chancellor, Directors of Resident Instruction, Research and Extension Education, Deans of the Colleges and Heads of the Departments. Staff positions are established for the Registrar and Comptroller. The administrators and staff who are serving HAU in 1973 are given in Table 14.

The Directors and Deans are placed at the same level of responsibility, although their functions differ. The Directors are the University-wide coordinators and/or administrators of teaching, research and extension education, respectively; the Deans are responsible only for the instructional programs in their colleges. The Act/Statutes prescribe that the Department Head is responsible to the Director of Research for research; to the Director of Extension Education for extension activities, and to the College Dean for the teaching programs.

The administrative organization has not been adjusted to conform with the recommendations made by a Joint Study Team (T. S. Sutton from OSU, W. N. Thompson from the University of Illinois, and O. P. Gautam and J. B. Patel of the Indian Council of Agricultural Research) and published in a book "An Assessment of Progress, Punjab Agricultural University" March 3, 1970.

The chief difference between what the University has adopted and what the recommendation calls for pertains to relative responsibilities of the Deans and Directors and their respective relationships with the Department Heads. The recommendation assigns to the College Dean full responsibility for the functions of teaching, research, and extension education in his College, with the Department Head then being only directly responsible to the Dean for his total program. Under this system, the principal upward channel of communication of the Department Head is with the College Dean, and that of the Dean with the respective Directors for programs in teaching, research, and extension education. With this arrangement, the three directors are truly university-wide coordinators/administrators, and the Deans have their rightful role as principal administrators of their Colleges.

The tremendous strides made by HAU during its short life is testimony to the dynamic leadership provided by the Vice-Chancellor. Undoubtedly, he has devised the plans, defined the purpose, set the course of direction, provided the example, and given the inspiration for the development of the institution to this point. His plans for the future of the institution are such as to stretch the imagination of any person who has witnessed the

development of educational institutions. Although the Vice-Chancellor has given first priority to the building of the physical plant, he has been sensitive to and aware of the fact that a strong institution must depend more on people than on buildings. For this reason, he has encouraged high standards of performance for all those associated with the University.

The Vice-Chancellor has recognized the urgent need to develop greater strength and depth of top-level administration of the University so that in his absence and upon his retirement the continuing management of the institution will be in capable hands.

All administrators are appointed for a three year term. Under this arrangement, an administrator may return to the post of Professor in the Department of his specialty at the end of his three year term or at any time he relinquishes his administrative position. This system is believed to insure future vitality in the administration of the University. It is unique among Indian institutions where the permanency of administrative appointments often lead to stagnation.

The three year old Haryana Agricultural University is at a very critical stage at which utmost care is needed in selecting administrators at all levels since they, in large measure, will determine the destiny of the institution. The University now has many capable administrators at the College and Department levels, yet there are obvious weaknesses in certain areas. Hopefully, the University will not ignore the potential of some of the younger faculty members as it searches for more administrative vigor.

The University has reached out and obtained the services of both mature and young talented scientists to fill important posts in the teaching, research, and extension programs. With proper encouragement and support, these newcomers can contribute significantly to the development of their respective spheres within the University structure.

Since the University is only three years old, it is undergoing the normal growing pains in respect to development of a full corps of qualified staff in all of the major areas. When the University began its programs, there was urgent need to obtain a sufficient number of staff members to handle the obligated responsibilities. Under such a situation, it is obvious that all of the staff obtained would not be as highly qualified as would be possible under more normal conditions. Therefore, there are areas of the University where the development of a stronger staff is essential. The Vice-Chancellor has clearly stated his desire to obtain the best qualified staff available for the principal positions, and there is evidence that this objective is being realized.

Under the USAID/OSU Contract Program, a number of faculty members have obtained training in the United States. This is particularly true of the faculty in the College of Veterinary Medicine and in other units of the University which were relatively strong before bifurcation occurred.

There is need now to intensify so that some of the weaker areas may be strengthened at the earliest possible moment. Obviously, any foreign



OSU John W. Hibbs (center) Animal Scientist, HAW, 1969-1971.



OSU Donald C. Herr, Agronomist at HAU, 1969-1970

training programs of the future should be related specifically to the Academic Development Plan of the University which defines the needs. This Plan was developed in 1972.

C. INTEGRATION OF TEACHING/RESEARCH/EXTENSION

This young University has embarked vigorously to achieve fully the integration of teaching/research/extension. At the present time, the integration is functioning in accordance with the State Act/Statutes in which the Department Head is responsible to the Dean of the College for instruction, to the Director of Research for research and to the Director of Extension Education for extension programs.

A review of the operations of several departments indicates that departments vary significantly in respect to the full implementation of integration as they involve research and extension. Joint meetings between the departments and the respective directorates could be used effectively in some cases to create fuller understanding and make possible the development of programs more closely knit to the departments' objectives.

Of great concern should be the tendency to initiate research and extension programs in which the faculty members involved are not firmly attached to the Department of their specialty and made directly responsible to their Department Head. Furthermore, it is highly desirable that the responsibilities of the College Deans be all inclusive, i.e. include the administration of the three functions of teaching, research and extension within their respective Colleges, as recommended by the Joint Study Team in 1970.

There is another concern to which the University may wish to give attention. Plans are to construct a facility for extension and continuing education programs. If this facility is to house all of the subject matter specialists in extension, a system will need to be established to insure a close cooperation between the extension director and the respective departments so that the extension subject matter personnel are held principally responsible to the department head for their specialized duties. The same principle applies to those specialists assigned to the District Advisory and Service Centers.

The University policy is for each faculty member to be engaged in at least two functions, i.e. teaching and research, teaching and extension, or research and extension. If this policy is followed, it should bring close integration of the functions.

Overall, conclusions may be drawn that achievement of integration of this University is progressing well. If the present plans of the University are carried forward and proper consideration given to the potential weaknesses complete integration will be achieved.

D. PHYSICAL PLANT

The University embarked upon a gigantic campus development program immediately after it was created. This construction program is continuing and is all inclusive in satisfying the requirements for administration, teaching at both undergraduate and post-graduate levels, library, research laboratories and related facilities, extension education and training, residential quarters for administrators, faculty, and non-professional employees, hostels for students and off-campus groups, and extensive recreation facilities for students, faculty, and non-professional employees. Some have said that the development of the physical plant of this University surpasses anything they have ever seen.

The physical facilities for the Colleges of Animal Science and Veterinary Medicine are generally excellent for the work being done. Major improvement in the poultry facilities has occurred. Space and related facilities are limited for meat/milk processing but there has been little justification for accommodating an expansion in this section until the Food Science and Technology building was completed.

Some areas are badly cramped for space, particularly for certain departments in agriculture, basic sciences, and for the extension directorate. New buildings are being completed for Basic Sciences/Humanities and for extension/continuing education, and this will alleviate some of these critical problems. The efficiency and morale of the administrators/staff in some of the distressed areas would be improved if more satisfactory temporary allocations for space could be made.

The engineering workshops were completed in 1972 and provide an essential need for Agricultural Engineering. The Home Science complex, which is nearing completion, will be perhaps the best physical accommodations in the world for home science programs.

In large measure, the planned target dates for construction are being met. The Chief Engineer, working directly with the Vice-Chancellor has provided the impetus and supervision by which the construction has proceeded at an extremely rapid rate. At times during the last three years as many as 40 buildings were under construction and approximately 6000 workers were being employed on the construction program.

The campus will have features unique for India if not for all of Asia. When the University was created in 1970, the Vice-Chancellor decided that the first objective in developing the institution was to provide recreation and housing accommodations unsurpassed in India; facilities that would be of such quality as to attract top-flight students and staff and make possible an environment suitable for pleasant living, maximum productivity, and high morale. This goal is essentially achieved. The comprehensive student welfare activities complex, the new Faculty Club, and ample recreation grounds for students and the families of professional and non-professional employees are now in full use.

For housing administrators and faculty members and their families, the University has departed from the traditional row-house concept which exists



Indian Parliament visitors to OSU in 1970. l. to r. HAU Vice-Chancellor Fletcher, Dr. G. S. Dhillon, Speaker of the Lower House of Parliament, India, Pres. Novice G. Fawcett and others from Indian Parliament & OSU.



l. to r. OSU Faculty Advisor Ed. Bohl, HAU Vice-Chancellor A. L. Fletcher, and R. K. Paul Gupta, HAU Faculty student at OSU.

on other Indian Campuses to construct individual houses scattered about in a colony arrangement. Some of these are already occupied. The intermingling of administrators and faculty in this colony is aimed at producing a more harmonious community of administrators, educators and scientists.

The University has also constructed and staffed the Campus school, an unusual facility for providing education for the children of the University employees and for a selected number of off-campus children.

Another feature of the campus is a modern rather complete shopping center, which provides for the day-to-day needs of the University employees.

The University now has some three thousand (3,000) acres of land for teaching and research purposes. Much of this is contiguous to the campus proper. This land provides a sound base for well-rounded teaching and research programs.

The Vice-Chancellor with his engineering staff have also undertaken to develop the Kaul College in the district of Karnal, about 80 miles from Hissar in the eastern part of the state, into a regional campus of the University. The headquarters for the Regional Rice Research Center will also be located at Kaul. Agriculture is being taught at Kaul College at lower levels and then students will be transferred to Hissar at higher levels. Elsewhere in the State, the University has assumed responsibility for construction of Farmers' Advisory Service Centers at Rohtak, Ambala, Karnal and Narnaul, and the Dry-farming Research Center at Bawal. A Sugar-cane Research Center near Yamuna Nagar is being planned.

Under the guidance of the Vice-Chancellor, the University architects have planned the District Administrative Centers and judicial complexes at Hissar and Gurgaon, the Government College and Hostels and the Borstal Institute at Hissar. The University has been entrusted with the construction of all of these buildings with the exception of the complex at Gurgaon.

The conclusion is that the physical plant of the Haryana Agricultural University will most likely be superior to that of any other similar institution in southeast Asia and will be a model for others to follow. The physical facilities will be such as to make possible outstanding service-oriented programs in all facets of administration, teaching, research, and extension education.

For full information about what the University has done and what it plans to do in the way of its development, the reader is referred to the following publications, many of which are of outstanding quality:

1. The Haryana Agricultural University - Its Past, Present and Future. A. L. Fletcher, Vice-Chancellor, September, 1970.
2. First Convocation Report. A. L. Fletcher, Vice-Chancellor, April, 1972.
3. Report of the Vice-Chancellor, Annual Convocation, April, 1972.
4. Development Plan Report Number 1, Haryana Agricultural University, 1972.
5. Aims, Objectives & Plans, Haryana Agricultural University, Jan. 1972.



Cornerstone Laying at Home Science Building Ceremonies at HAU, 1971.
OSU Fanchon Warfield, Home Economist, (center)



Construction Work at HAU

6. Campus Core, Haryana Agricultural University, 1972.
7. College of Home Science for Women, Haryana Agricultural University, Foundation Ceremonies by Mr. Bansi Lal, Chief Minister, March, 1971.
8. Campus School, Haryana Agricultural University. Inaugurated by Mrs. Om Prabha Jain, Haryana Finance Minister, November, 1971.
9. Kaul Campus, Haryana Agricultural University. Foundation Ceremonies by Mr. Bansi Lal, Chief Minister, November, 1971.
10. District Administrative Center and Judicial Complex - Hissar. Foundation Ceremonies by Mr. Bansi Lal, Chief Minister, October, 1971.
11. District Administrative Center and Judicial Complex - Gurgaon. Foundation Ceremonies by Mr. B. N. Chakravarty, Governor of Haryana, November, 1971.

E. CAMPUS DEVELOPMENT AND ACADEMIC PLANS

At the time that the University was established, the Vice-Chancellor recognized that sound capital improvement and academic plans were essential if the institution was to develop in an orderly way into an outstanding agricultural university. First priority was given to a plan for development of physical facilities.

At the outset, the long-range objectives of the University were identified. An initial Campus Development Plan was prepared for beginning the construction program. Subsequently, this original plan has been re-evaluated and revised and presently calls for the Campus to be completely developed in a five-phased program. The first two important phases were targeted to be completed within two years.

In the previous list of University publications, Publications numbered 4, 5, and 6 present fully the aims and purposes of the University and document the stepwise construction of the physical plant.

The publication "Development Plan Number 1" is an effectively illustrated, comprehensive and factual presentation of the Campus Development Plan of the University. The quality and completeness of this publication is such as to be a credit to the most prestigious University in the United States.

Although this document emphasizes the Campus development aspect, it contains portions having specific relevance to academic planning. The University administration then turned its attention to the development of an academic plan which hopefully will be comparable in purpose and scope to its plan for development of the physical plant. A sound long-range academic plan has been identified by the Vice-Chancellor as the project of highest priority.

Specific action was taken to prepare this long-range academic plan. A Master Committee was created and information material on academic plan development was prepared, distributed, and discussed with top administrators and department heads. Target dates were established for step-wise development of the final document. It was somewhat delayed by illness and change of administrators and faculty, but it is expected to be completed soon.

The attitude and interest of the faculty and departments in respect to academic plan development has been excellent. All units of the University appeared to be actively engaged in developing their respective plans. The Vice-Chancellor's goal is to have a plan which will serve as example for other similar institutions.

F. FINANCIAL RESOURCES AND SUPPORT

From the time of its inception, the University has been given generous support by the State Government. The requests by the Vice-Chancellor have met with unusual response and, in many instances, the State provided funds in excess of those requested by the University. The generous support has been responsible for the dynamic building program which has been continuing since the University was created.

By the middle of 1972, an expenditure of Rs. 455.17 lakhs (6 million dollars) had been approved for buildings and development by the State Government of Haryana. It was expected that this would increase to about 1100 lakhs or \$14.5 million by 1974 or 1975.

In addition to this support from the State Government, the sum of Rs. 165.91 lakhs was expected from the Government of India through the Indian Council of Agricultural Research. The University is obtaining maximum construction per rupee spent by employing its own engineers/architects and by direct hire of all laborers.

Not only has the State contributed fully to the building program, but it has provided substantial support for teaching, research, and extension. The total research program of some departments is being financed by State funds. In other cases, the State funds are being supplemented by funds for enlarging the staff in existing units and in providing highly-qualified administrators and faculty for the new units which are anticipated. Funds appear to have been ample to have attracted outstanding subject matter faculty from other institutions and to appoint top high-level administrators at above-normal salary levels. In general, conclusions may be drawn that the administrators and faculty members at the institution are generally well satisfied with the financial arrangements under which they serve.

The Academic Plan of the University should bring sharply into focus some important areas of the University which are still handicapped for lack of adequate financial support. Agricultural economics is one of such areas and there are likely others. Furthermore, the Academic Plan is expected to lead to recommendations and actions for consolidating some departments in order to increase efficiency, eliminate duplication of programs and

reduce operational costs. The identification of priorities by the University also permits it to maximize the utilization of the allocated funds for teaching, research, and extension in future years.

G. TEACHING

The objective of the University is to make certain that the entire teaching program is highly relevant to the needs of the student, the graduate and to the State and region. The Vice-Chancellor has made this point very clear to all of those engaged in the instructional program. As a whole, it appears that the colleges and the departments recognize the necessity of relating their teaching activities to needs and, in most cases, an earnest effort is being made to achieve this relationship.

The University desires to ensure that every student gets an adequate amount of practical training in his field of specialization. In the crop area, students are assigned plots of land and are given responsibility for managing and operating these plots through all phases of crop production. Reports indicate this aspect is going well. A similar plan exists for providing practical training for students in the livestock area, but this has not been vigorously implemented.

The satisfactory implementation of the plans for practical training of students rests with the Department Heads and the teaching faculty. Those responsible must be willing and able to translate theory into practice and, themselves, to demonstrate and perform the tasks assigned to the students. This link must be strengthened if the students are to profit materially from the University's practical training programs.

Another problem with which the University administration should grapple is that of course proliferation and subject matter duplication. Consolidation of some departments, more clearly defined areas of teaching responsibilities, and fuller use of inter-disciplinary approaches merit consideration. This is an area of concern to which the Director of Resident Instruction can direct attention.

Teaching Improvement

To determine precisely the effectiveness of teaching throughout the University will require an in-depth, department-by-department analysis. Unquestionably, teachers and departments vary in this respect.

The University held its portion of the All-India Teaching Seminar Program, February 16-19, 1972. The seminar dealt with three subjects: (a) teaching methods, (b) curricula building, and (c) student evaluation. A sub-committee, constituted for each of the three subjects, developed the necessary programs. All faculty members participated as delegates and post-graduate and under-graduate students attended as observers. Approximately 265 delegates participated. Although initially planned for three days, the high interest and vigorous discussions necessitated an additional day. Unquestionably, the seminar was an outstanding success. A contributing factor was the full support given to the program by the Vice-Chancellor.

The seminar recommendations express the desire of the administrators/faculty for additional teaching improvement seminars on a regular basis.

Student Enrollment and Welfare

The Student enrollment pattern for the University from 1965 to 1971 is revealed by the detailed information in Table 15. Since 1970-71, the Colleges of Home Science and Basic Sciences and Humanities have been added and so the enrollment is higher presently.

These figures indicate that the enrollment has increased since courses were first offered in 1965-66, but the level the last four or five years is mostly between 1000 and 1200. This is in accordance with the Vice-Chancellor's plan to maintain a relatively low enrollment until the physical facilities are completely ample to satisfy the teaching and student welfare needs. The Vice-Chancellor now projects a substantial and steady increase in students, reaching a level of about 5000 within about 5 years. Within 10 years or perhaps less, he anticipates a student population of 20,000-25,000.

About one-third of the enrollment has been post-graduate students in the last few years. If there is an increased enrollment as expected above, the undergraduate students are expected to increase much faster and thus the post-graduate students will decline percentage-wise.

The keen interest of the Vice-Chancellor in students welfare, the excellent student recreation and meeting facilities, and the strict code of student performance enunciated by the Vice-Chancellor create an excellent environment. The Vice-Chancellor is vigorously attempting to break down the normal barriers between students and faculty and bring about closer personal relationships.

Student Employment/Land Utilization

The employment of University graduates has been a vexing problem throughout India. This is a problem which confronts HAU. Also, with the land ceiling policy of the Central Government, there arises the question on the efficient use of the surplus land. Both of these problems were merged in an innovative proposal by Vice-Chancellor Fletcher, published in early 1972 as a pamphlet entitled "A Scheme for the Proper Utilization of Surplus Land with the Help of Agricultural Universities and their Graduates and Short-Term Technology Students".

The scheme calls for the consignment of a substantial section of land which would be sub-divided into relatively small plots of various sizes. These plots would be assigned to University degree-holding and short-term technical graduates from agriculture as well as to a limited number of ambitious farmers. These groups would comprise a colony - with each individual being responsible for his share of the land. Common purchasing of the necessary inputs and common use of modern farm machinery would permit economy of operation. As indicated above, this is proposed as a means of

Table 14. Officers and Administrators of the University
During 1973

University Administration

Chancellor/Governor	Mr. B. N. Chakravorty
Vice-Chancellor	Mr. A. L. Fletcher
Director of Research	Vacant
Director of Resident Instruction	Dr. R. M. Sharma
Director of Extension, Education	Dr. J. C. Sharma
Assistant Director of Research	Dr. Kanwar Singh
Comptroller	Mr. Y. P. Dhir
Registrar	Mr. L. Ramachandran
Chief Engineer	Mr. I. D. Mirchandani

College Administration (Deans)

Agriculture	Dr. M. K. Moolani
Animal Science	Dr. S. S. Prabhu
Basic Sciences/Humanities	Dr. S. N. Kakkar
Veterinary Science	Dr. R. P. S. Tyagi
Home Science	Dr. Susheela Dantiyagi

Department Administration (Department Heads)

Agriculture

Agr'l. Engineering	Prof. & Head	Dr. O. P. Gulati
Agronomy	Prof. & Head	Vacant
Entomology	Prof. & Head	Dr. D. S. Gupta
Extension Education	Prof. & Head	Dr. Y. P. Singh
Horticulture	Prof. & Head	Dr. J. P. Singh
Plant Breeding	Prof. & Head	Dr. N. D. Arora
Plant Pathology	Prof. & Head	Dr. O. P. Garg
Soils	Assoc. Head	Dr. V. C. Shikla
Vegetable Crops	Prof. & Head	Dr. Kirti Singh

Animal Science

Animal Breeding	Dean cum Head	Dr. S. S. Prabhu
Animal Nutrition	Prof. & Head	Dr. K. Pradhan
Animal Production	Prof. & Head	Dr. M. N. Razdan
Livestock Production and Management	Prof. & Head	Dr. R. N. Pal

Basic Sciences and Humanities

Botany	Assoc. Head	Dr. R. K. Grover
Chemistry & Biochemistry	Prof. & Head	Dr. B. M. Lall
Economics & Sociology	Prof. & Head	Dr. M. V. George
Genetics	Dean Cum Prof. and Head	Dr. S. N. Kakkar
Languages	Asst. Prof. and Head	Mr. T. C. Anand
Microbiology	Prof. & Head	Dr. S. R. Vyas

Veterinary Science

Anatomy & Histology	Prof. & Head	Dr. L. D. Dhingra
Pharmacology	Prof. & Head	Dr. Allaudin Ahmed
Vet'y. Bact. & Hygiene	Prof. & Head	Dr. I. P. Singh
Vet'y. Medicine	Prof. & Head	Dr. O. P. Gautam
Vet'y. Parasitology	Prof. & Head	Dr. Karam Chand Malik
Vet'y. Pathology	Prof. & Head	Dr. D. S. Kalra
Vet'y. Surgery and Radio- logy, Gynaecology and Obstetrics	Dean Cum & Head	Dr. R. P. S. Tyagi

utilizing efficiently the available surplus land and, simultaneously, finding worthwhile employment for qualified graduates from the University. In addition, by having a mix of University graduates and small farmers, the latter will be able to benefit from the latest knowledge and the former from the practical know-how of the non-educated farmers. The Vice-Chancellor projects an annual net income per person of not less than Rs. 500.

Table 15. Fall Trimester Enrollment in the University for the Period 1965 - 1971

	<u>1965-66</u>	<u>1966-67</u>	<u>1967-68</u>	<u>1968-69</u>	<u>1969-70</u>	<u>1970-71</u>
<u>COLLEGE OF AGRICULTURE:</u>						
Undergraduate	273	484	321	530	535	492
Post-graduate (Inc. Basic Sci.)	27	71	114	210	122	240
Total	<u>300</u>	<u>555</u>	<u>445</u>	<u>740</u>	<u>657</u>	<u>732</u>
<hr/>						
<u>COLLEGE OF ANIMAL SCIENCE:</u>						
Undergraduate	---	16	34	56	75	62
Post-graduate	---	--	23	24	35	31
Total	---	<u>16</u>	<u>57</u>	<u>80</u>	<u>110</u>	<u>93</u>
<hr/>						
<u>COLLEGE OF VETERINARY MEDICINE:</u>						
Undergraduate	281	295	291	291	264	140
Post-graduate	54	83	74	77	70	55
Total	<u>335</u>	<u>378</u>	<u>365</u>	<u>368</u>	<u>334</u>	<u>195</u>
<hr/>						
<u>GRAND TOTALS:</u>						
Undergraduate	554	795	646	877	1074	694
Post-graduate	81	154	211	311	227	326
Total	<u>635</u>	<u>949</u>	<u>857</u>	<u>1188</u>	<u>1301</u>	<u>1020</u>
<hr/>						

The Haryana Agricultural University allocated the total of 500 acres for the initiation of this project. The Vice-Chancellor proposed a similar scheme for the State Government in which the small farmers would be in the majority.

H. RESEARCH

A review of the reports of the Research Directorate of the University reveals that the University is carrying forward a vigorous research and development program. The intensity and diversity of research varies between departments, most likely related to age of the department, staff size, and budget.

Because of the youth of the University and the unavailability of a fully-titled Director of Research until recently, the total research program appears to be somewhat fragmented and not to possess, in all cases, a sound foundation with relevance to crucial needs. Therefore, one senses that the Departmental research in many areas has not yet reached a maturity where it has the base, structure and the direction to make major contributions towards solving the most vexing agricultural problems of the State and region. The University now faces the challenge of conducting an in-depth analysis of the research activities of every department with the view of identifying the highest priority problems in each area to which the research workers should give concentrated attention.

As is true for many Indian Agricultural Universities, there is a tendency to proliferate and diversify research projects - with the view that the number of projects of a research worker is a measure of his research productivity. Limiting projects to one or two highly relevant studies in some departments would permit the marshalling of research resources by which much more significant progress may be made.

New physical facilities recently made available for research/development are, in general, excellent. The new engineering workshop, the improvements made in livestock and poultry facilities, the new structure for Basic Sciences/Humanities, the availability of a separate instrumental cell, and the large central library will provide an outstanding physical plant for research. These new structures permit the allocation of more space to certain agricultural departments which have been handicapped.

Ample land, contiguous to the campus proper, is available, plus a number of regional research centers distributed advantageously throughout the State. The campus research farm appears to be well-managed, the research plots are laid out so that each research need is or can be satisfied. An OSU faculty member helped lay out this research farm.

Research is being conducted on almost all major food grain crops; in addition, active research projects exist for sugarcane and cotton. Heavy emphasis is being given to plant breeding, cropping patterns and water and plant nutritional requirements. Horticultural research on vegetables and fruits is receiving major attention. One area of the campus farm is devoted to dry land research. Because the State of Haryana is close to

Delhi, the easy accessibility to a thriving market, intensification of University research on cash crops would appear to be warranted.

Forage research is also considered to be a highly important segment of the University's research program. The University has a long-established background in forage research and production and a nucleus of highly capable, experienced research leaders/workers in this field. The Vice-Chancellor created an inter-disciplinary committee, under the Assistant Director of Research, to provide a strong thrust to forage research.

Livestock research at HAU has not achieved the desired level either in quantity or quality. Much may be expected in this field, in view of the fact that the University has a separate College of Animal Science with outstanding facilities. The establishment of a Poultry Department within this College, the expansion and improvement in physical facilities for poultry, and the strengthening of the poultry staff should permit this new department to carry forward a strong research program in chickens, ducks, and turkeys. An OSU Professor helped develop this area in 1971-72.

The department of Animal Nutrition in the College of Animal Science has a well-equipped livestock nutrition evaluation laboratory, able leadership, and, for a new department, a relatively strong research program. An OSU professor helped develop this area from 1969-1971.

The University has an excellent opportunity to become an outstanding center for livestock research and development, particularly in dairying. Located close to the University are large government livestock farms or organizations, which give attention to both dairy cattle breeding and forage production. The University has a mature, well-equipped and well-staffed College of Veterinary Medicine. The Central Government's National Dairy Research Institute is at Karnal, in the same state, about three hours driving time away. With the facilities, staff, and programs already available at HAU, coupled with a sound cooperative relationships with the nearby farms, organizations and institutions, the University has the foundation and environment for a full-scaled attack on the problems of livestock feeding, breeding, disease control and marketing.

Another research area in which the University aspires to be outstanding is in Soils/Water research, particularly in dealing with salinity problems. It is now actively engaged in a collaborative project with the Regional Soil Salinity research Institute at Karnal, under a United Nations Development Project.

The University is giving considerable attention to the utilization of grapes for wine and raisins and significant progress has been made in respect to the former. An expansion in the program of agricultural products conservation and utilization is anticipated when the Food Science/Technology building is completed and this Department established as a full-fledged entity.

One area of research which justifies greatly increased attention is Agricultural Economics. The Department of Agricultural Economics is under

able administration, but is limited in staff, budget and in research programs. Haryana has enormous need for analysis and economic research on agricultural production efficiency, alternative farming opportunities, cost-return relationships, and marketing, transportation, and distribution methods.

As the University examines objectively its research programs and charts the course for its future research, it will want to give careful attention to (a) the consolidation of some departments, (b) elimination of duplication, repetition, and the overlapping of research which now exists, and (c) greater use of inter-disciplinary research projects. The long-range plans for the University programs will undoubtedly deal with these needs.

I. EXTENSION EDUCATION

The University's organization and policies are geared to make possible an effective state-wide extension education program. Extension Advisory and Service Centers are or will be established in each of the 15 districts of the state, each staffed with eight extension specialists of the University. Many of the faculty members on the Hissar campus are expected to give either full-time or part-time to extension activities. Integration of extension with teaching/research is expected to be practiced at the department level.

Within the State, the University is assigned the teaching and training functions for extension, the appropriate State departments are responsible for farm service and supplies and for much of the village-level and farm-level extension activities. A close relationship between the University Extension Directorate and the State Government is essential for a successful total extension program. The extent with which this cooperation is being achieved on a continuous and season-to-season basis is unclear.

The Director of Extension Education has prepared a preliminary long-range plan which presents quite effectively, the present and anticipated programs for State-wide extension activities. This plan reveals that the Extension Education Directorate is to be sensitive and responsive to the needs of the agricultural segment of Haryana and is conducting its programs with the service objective in mind.

The University has or is constructing facilities on the campus and in the districts for providing guidance, training, and/or housing for farm men and women. The University plans to give great emphasis to continuing education and non-degree programs.

Some of the recent developments and/or activities related to Extension Education at HAU follow:

1. Two Agricultural Officers' Workshops for finalizing the package of practices for Kharif (wet season) and the Rabi (dry season) crops are held each year. This includes about fifty officers from the State Department of Agriculture; about 125 specialists/faculty members of HAU, and a few people from other organizations

who review research and develop recommendations for state-wide use. The recommendations are later published and distributed.

2. The annual Kisan Mela (Farmers' Fair), in 1972, was attended by 4065 registered farm men and women. A feature was a parade, exhibit, and demonstration of improved farm implements and equipment.
3. The Faculty-cum-Farmers complex was constructed on the University campus, and is being used for farmers' short courses.
4. Substantial progress has been made in building Farmers' Advisory Service Centers in each district and providing a staff of eight specialists in each.
5. District-level Farmers' Training Camps are organized in all districts with the Department of Agriculture collaborating.
6. Training programs for farm women are held on cooking, nutrition, and home management.
7. Training programs in tractor operation and maintenance are held and the trainees later qualify for the tractor driving license.
8. Some thirty-five officers and experts participated in a Clinical Conference on Animal Health and Production Problems, with the State Department of Animal Husbandry collaborating in 1972.
9. The Directorate prepared and distributed (a) a bulletin on "Job Descriptions and Responsibilities for District-Level, Subject-Matter Extension Specialists" and (b) A "Daily Diary for District Level Extension Specialists".
10. Training courses are provided for farm women dealing with fruit and vegetable preservation.
11. Upon invitation from the Extension Directorate, farmers attend the annual convocation of the University.
12. The First All-India Seminar on Blook Protozoan Diseases was held in collaboration with the Indian Council of Agricultural Research in 1972.
13. Construction of the Gandhi Bhawan and the Indira Gandhi Auditorium on the Hissar Campus is being completed, buildings designed to house extension education and to provide for a full range of continuing education programs.

VI. HIMACHAL PRADESH UNIVERSITY IN 1973

Higher Education in Agriculture in Himachal Pradesh is a part of the University of Himachal Pradesh. The so-called Agricultural Complex has two campuses, one at Palampur and the other at Solon. This was all organized into the University in 1970. An agricultural school was in existence near Simla before 1955, but it was not offering a degree course. It is now on a campus at Solon near Simla and it offers a B. S. degree course in Agriculture.

The College of Agriculture at Palampur was started in 1966 as a part of the Punjab Agricultural University. It began operating in temporary rented quarters in Palampur. It is now on a campus about one mile out of Palampur consisting of about 50 acres, with academic building, dormitories, and faculty houses. Even though it was only a College of Agriculture, the faculty included those who taught basic sciences and humanities as well as agricultural subjects.

The present Agricultural Complex of the Himachal Pradesh University is administered by a Dean and Director, Dr. H. R. Kalia. He was the founding Dean of the College at Palampur, and is a Ph.D. graduate in Horticulture at The Ohio State University. He was also a short term administrative trainee on the contract program at The Ohio State University in 1971.

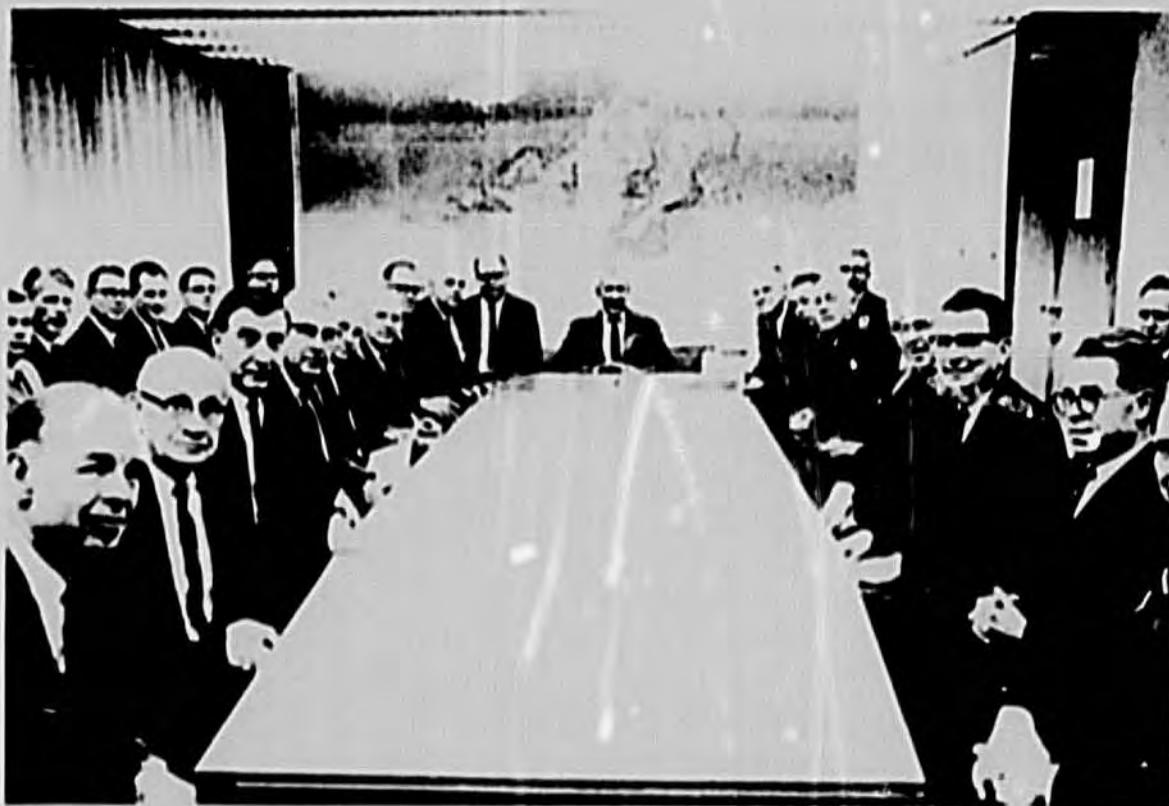
The present enrollment at Palampur is about 200 students per year. The faculty members combine research and extension education with their teaching activities.

The Agricultural Complex of Himachal Pradesh University in reality has just begun. There is great need for the development of higher education, research and extension education in this state.

The OSU/AID contract program provided only a small amount of assistance for Himachal Pradesh. A few items of library materials and equipment were provided at Palampur and earlier at the State Department of Agriculture at Simla. Besides the Dean and Director, only two members of the faculty from Palampur were provided advanced training at OSU in the United States. Early in the program two from the State Department of Agriculture were provided training. A number of The Ohio State University faculty located at Ludhiana provided some technical assistance to the College at Palampur. Also, some of the OSU faculty gave a small amount of assistance to the state in research and extension education. Without doubt, the OSU Program helped lay a sound basis for the development of Agricultural academic instruction, research and extension education in Himachal Pradesh.



Administration Building, College of Agriculture,
Palampur Campus, Himachal Pradesh University.



Executive Visitors and Chiefs of Party from the U. S. Universities and U. S. Ambassador Chester Bowles and AID Personnel
in Delhi, 1968

VII. ACCOMPLISHMENTS, EVALUATION, AND SUMMARY

Some specific accomplishments will be stated briefly for the area, and each Agricultural University or State in the area. Then an evaluation of the project will be made of the two main agricultural universities, PAU and HAU, as to how well they meet the criteria designated for developing universities in India which were the main objectives of the project. Finally, a summary will be made of the project and its overall contributions.

A. PROGRAM ACCOMPLISHMENTS - 1964-73.

Many specific accomplishments of the OSU/AID program from 1964 to 1973 in the Punjab, Haryana and Himachal Pradesh states of India have been described in the annual reports and the individual OSU faculty reports. As we attempt to summarize the entire program, it becomes apparent that indeed there were many fine contributions made to the development of the Universities and the agriculture in these states.

Some of the accomplishments on the University contract from 1964-73 were a continuation and an expansion of those achievements during the preliminary regional contract program from 1955 to 1964. The benefits of the program will be summarized first for the combined area, and then by individual states.

Total Area

1. The leadership in the three states and universities as well as many faculty members through the OSU/AID program have become well acquainted with the essential principles and objectives of a service-oriented agricultural university with the integrated three functions of resident instruction, research and extension education. This may be very important in the development of the University in the future.

2. In cooperation with the administrators of the Universities, the States, and the Government of India, plans were developed for the organization and administration of Agriculture and Home Science teaching, extension education, and research in the States of Punjab and Haryana.

3. On the job training for faculty was provided and teaching and research were improved at all three Universities at Ludhiana, Hissar and Palampur, as 33 OSU faculty members worked with the University faculties from 1964 to 1973. (A total of 48 OSU professors since 1955).

4. OSU faculty demonstrated and helped develop new courses, new teaching methods, new equipment, 4-H club-type youth programs and new research and extension programs at the Universities and in the three states.

5. The OSU/AID program provided special advanced training in the U. S. from 1964 to 1973 for 75 Indian faculty members from the three Universities. These added to those trained from 1955-64 make a total of 106 individuals from Punjab, Haryana and Himachal Pradesh trained since 1955.

6. Research plans were developed for the Punjab Agricultural University and the Haryana Agricultural University including the organization and administration. Research was initiated and improved in a number of subject matter areas oriented to solving the farm villagers' problems.

7. Library holdings were expanded and improved on the three University campuses. About 900 books were sent by OSU from 1964 to 1973, and this added to those sent to these institutions on the regional contract made a total of about 3800 books since 1955.

8. Laboratory equipment was increased and improved and supplies were provided on all three campuses. About 500 major items of equipment were purchased in the U. S. by OSU and shipped to this area of India since 1964. This made a total of about 3295 major items purchased and shipped from 1955 to 1973, besides thousands of small items and repair parts.

9. OSU Faculty authored 40 or more Technical and Professional Publications on Indian Agriculture and related topics, from 1955 to 1973, mostly published in India. (Appendix table 8).

Punjab Agricultural University

1. Provided guidance and consultation in the establishment of the organization and academic structure of the University.

2. Provided training for faculty of PAU in teaching and research as 24 OSU faculty members worked with them at PAU for various lengths of terms from 1964 to 1973. (A total of 36 OSU professors since 1955).

3. OSU programmed, managed and financed with AID support special advanced training in the U. S. from 1964 to 1973 for 42 PAU faculty members. These added to those trained from 1955 to 1964 on the regional contract made a total of 54 trained since 1955.

4. Library holdings were increased at PAU by a total of about 2500 books purchased and shipped by Ohio State University from 1955 to 1973.

5. About 1750 major items and many more small items of equipment were purchased and shipped by The Ohio State University to PAU from 1955 to 1973.

6. Assisted with the selection of locations and the beginning development of regional research centers in the Punjab.

7. Helped develop a strong poultry program - academics, research, extension education (Academic to Masters program) which has been most influential in the development of a highly successful poultry enterprise throughout the Punjab.

8. Assisted in development of a farm management training and research program through to the level of Master of Science.

9. Helped initiate a computerized data processing program.
10. Instrumental in developing a one-year training course in research methodology.
11. Helped introduce, plan, and develop a communication and information program and center at PAU which has become highly effective for the Punjab and the University.
12. Helped initiate, plan and develop the College of Home Science, B.S. and Masters curricula, specific courses, some research, buildings and laboratory equipment.
13. Took considerable responsibility for planning, equipping and development of a functioning toxicology laboratory in the Department of Entomology.
14. Provided guidance and equipment for the development of a laboratory on cereal processing technology - the basis for an academic and research program in this field.
15. Provided assistance in initiating and sponsoring a number of specialized conferences, workshops, and seminars relating to teaching, research and extension education.
16. Assisted in the planning of the College of Agricultural Engineering.
17. Provided consultation on the development of horticulture programs of teaching, research and extension education.
18. Initiated and helped develop a program of plant tissue analysis to determine fertilizer needs for agronomic and horticultural crops.
19. Provided consultation for development of the program in agronomy and soils.
20. Helped develop the soil surveys and classification programs for the University in the Punjab.
21. Initiated and helped develop a program in food technology.
22. Provided leadership in analyzing the citrus decline problem in the state and initiated research in citrus virology.
23. Provided guidance and consultation in improving the program of new seed multiplication and distribution.
24. Provided consultation on engineering aspects of soil and water management.
25. Helped initiate program in dietetics of the College of Home Science.
26. Helped plan and develop a program of farm credit instruction at the Master of Science level.

27. Provided consultation on development of the area of Veterinary Mycology.

28. Established a close relationship between PAU and OSU - student exchange program continuing.

Haryana Agricultural University

1. Provided consultation and guidance in the establishment of organization and academic structure of the University.

2. Provided training for faculty from HAU in teaching and research as 14 OSU faculty members worked with them at HAU for various lengths of terms from 1964 to 1973.

3. OSU programmed, managed and financed with USAID support, special advanced training in the U. S. for 32 HAU faculty members from 1964 to 1973. These added to those trained on the regional contract from 1955 to 1964 made a total of 43 trained from 1955 to 1973.

4. Library holdings were increased at HAU by a total of about 800 books purchased and shipped by The Ohio State University from 1955 to 1973.

5. About 900 major items and many small items of equipment were purchased and shipped by The Ohio State University to Hissar or HAU from 1955 to 1973.

6. Helped plan and guide the development of over 2000 acres of research lands at the Hissar campus, including the organization and administration of the research program.

7. Provide guidance and consultation for the development of the extension educational program.

8. Initiated valuable research on weed control and developed a program for the University in this area.

9. Helped develop plans for program and buildings for the College of Home Science.

10. Initiated and helped equip and develop a complete animal nutrition laboratory to serve as an analytical center for a large inter-disciplinary program in livestock development.

11. Provided plans, guidance, and material assistance for the development of a strong program in poultry science.

12. Helped develop plans for the development of agricultural engineering, particularly farm machinery - resident instruction, research and extension.

13. Provided assistance in a number of specialized conferences, workshops, and seminars relating to teaching, research and extension education.

14. Provided some consultation in planning the further development of the College of Veterinary Science.
15. Provided consultation on development of programs in agronomy and soils.
16. Initiated soil classification and soil survey programs.
17. Initiated research in animal physiology.
18. Helped survey the problems of soil salinity and recommended research programs in this area.
19. Helped initiate an artificial insemination program for dairy cattle with imported semen from the U. S. (Ohio).
20. Provided leadership in analyzing the citrus decline problem in the state and initiating research in citrus virology.
21. Provided consultation in engineering aspects of soil and water management.
22. Provided consultation on development of veterinary mycology.

Himachal Pradesh University

1. Provided basic consultation and advice on organization and administration of agricultural education, research and extension education.
2. Provided consultation and administrative training to Dean of the College of Agriculture at Palampur and more recently the Dean and Director of the Agricultural Complex of the Himachal Pradesh University.
3. OSU programmed, managed and financed with USAID support special advanced training in the U. S. for 2 faculty members from 1964 to 1973. These added to those trained on the regional contract from Himachal Pradesh from 1955 to 1964 made a total of 5 trained since 1955.
4. About 150 books were added to the Library of the College of Agriculture at Palampur - purchased and shipped by OSU from 1966 to 1973. Also 228 books were provided the Himachal Pradesh Government at Simla from 1955-1964.
5. Some 50 items of laboratory equipment and some small items were purchased and shipped by The Ohio State University to the College of Agriculture at Palampur from 1966 to 1973. Also 28 items were provided the Himachal Pradesh Government at Simla from 1955 to 1964.

B. EVALUATION OF PAU AND HAU, BASED ON CRITERIA FOR UNIVERSITY DEVELOPMENT

As pointed out in the section on "Objectives", nine conditions or criteria were identified for assessing Indian University Development, and these conditions/criteria were adopted as the objectives for The Ohio State University Program. Therefore, they are used as the basis for analyzing and evaluating the project as related to the Punjab and Haryana Agricultural Universities.

A review of the 1971-72 Semi-Annual and Annual Reports of the OSU for Punjab and Haryana Agricultural Universities brings into focus the fact that these two institutions are superior when judged in terms of several of the major accepted conditions/criteria for University Development. Both universities (a) have excellent physical plants, (b) have received fully adequate financial support from the respective State Governments, and (c) have been blessed with extra-ordinarily capable and respected Vice-Chancellors who have provided the purpose, direction, and the needed inspiration and stimulus for the development of the institutions.

1. Financial Support from the Public Sector

At the time of their beginning, the Universities were given full support by the State Governments. The States provided ample land for both campuses and for related farm programs in teaching, research, and crop production, and assigned to the Universities the responsibilities for agricultural teaching, research and extension education. The State Act/Statutes made possible the operation of the Universities in accordance with the concepts of the Land Grant Institutions of the United States. Generous financial support has been provided throughout the history of the two institutions. The State support has made possible the establishment of regional research centers and district-level advisory and extension centers under the administration of the Universities.

2. Physical Plant

The campuses and physical plants of both Universities compare favorably with those in developed nations. The physical plants of the Universities have and are being developed in accordance with carefully prepared long-range plans. To a large extent, the Punjab campus is complete, and the construction underway will satisfy the University's major requirements. Further development of PAU's physical plant will necessitate a review and possibly a modification or enlargement of the original plan.

The Haryana Agricultural University's ambitious multi-phased plan for physical plant development was published in early 1972, although the initial phases of this plan were followed immediately after the University was established in 1970. The magnitude of development set forth in this plan and the rapidity with which the plan has been and is being implemented is almost beyond comprehension, even of persons well acquainted with campus development. Within two years, many of the essential buildings were completed and in use. At the end of the project period, the physical plant was largely adequate for the existing programs. When the planned campus development is completed, HAU will undoubtedly have the most outstanding physical plant in the East.

3. Administration

As earlier indicated, both the Punjab and the Haryana Agricultural Universities have been provided excellent top-level administration by the Vice-Chancellors, the dominant factor responsible for the recognized attainment of these institutions by the end of the project period. The Punjab Institution also has mature, experienced, and capable administrators in the majority of administrative positions and a decentralized administrative system which utilizes these talents to the maximum. Even in the absence of the Vice Chancellor, PAU operates efficiently and with a purpose.

Because of its youth, the Haryana Agricultural University has somewhat limited administrative capacity and there is a serious stoppage of activity in the absence of the Vice-Chancellor. In addition to the Vice-Chancellor, there are other capable administrators in the University, although recognized weaknesses in some areas. The University is attempting to strengthen its administration at all levels and has filled the positions of Director of Resident Instruction and Director of Research during 1971-72. Once capable administrators are in place, the adoption of a system of decentralized responsibility will provide a sound foundation for the University's future.

4. Long Range Planning

The recognized weakness of the Punjab Agricultural University in recent years has been the unavailability of a sound, long-range academic (program) plan, by which more precise judgments could be reached in respect to contributions by external agencies/institutions. Efforts made by The Ohio State University to generate such a plan have been generally unsuccessful, although the seeds have been planted and some response from the PAU's administration was observed near the end of the project period.

In 1971-72, Haryana Agricultural University decided that the development of an academic plan, equal in quality to its excellent campus development plan, was a matter of high priority. Subsequently much progress has been made to prepare this plan. The majority of the colleges/departments have proposed at least tentative plans for development. One may predict that HAU will complete and publish a sound, comprehensive academic plan.

5. Integrations of Functions - Teaching, Research, Extension Education

The State Act/Statutes for both the Punjab and Haryana make clear the intention for the two agricultural universities to integrate teaching, research and extension education in accordance with the Land Grant College pattern. The State Acts/Statutes have specified that the Department Head will assume major responsibilities in the integration and that to the extent possible, each faculty member will engage in at least two of the three functions of teaching, research and extension education.

The Universities have given major attention to the subject of integration and, to an appreciable extent, success has been achieved. Because of its maturity, reflected in the larger number of strong experienced administrators at both the Deans/Directors and the Department level, the Punjab Agricultural University is currently better able to conduct fully-integrated programs than HAU. The system currently used by both Universities, discourages integration of teaching, research and extension at the College level since the College Dean is responsible only for the instructional program in his college. The system apparently is functioning effectively at PAU and is favored by the Department Heads over one in which the College Dean is responsible for the administration of the functions of teaching, research, and extension education within his College. The administrative organization at HAU in respect to integration is yet subject to change and the final form will likely be revealed when the University's academic plan is released.

Within the Universities, particularly at HAU, there are areas where the principles of integration are not being adequately applied. Some of the faculty members do not share in joint programs, and, in certain instances, faculty members of a given specialty are not directly responsible to the appropriate Department Head. Also, the extent with which some extension education personnel and activities are integrated at the Department level is a matter to which the University administration should give attention.

There is some tendency for a proliferation of departments and programs at both Universities, a situation which decreases efficiency, increases costs, and interferes with inter-disciplinary approaches to problems solving. A reversal of this trend would be beneficial. HAU was giving careful attention to this problem at the end of the project period.

6. Faculty - Numbers and Qualification.

To a major degree, the Universities have an adequate number of well-trained faculty and the curricula/course content, and research and extension programs are relevant to the needs of the student/State/Nation.

The U. S. training program for Indian faculty programmed by OSU and financed by AID was used effectively by the two Universities to strengthen their personnel. Areas of weaknesses still exist and these should be revealed in any academic plans developed by the institutions. The Haryana institution has a number of under-developed areas which are especially worthy of consideration for further assistance.

7. Academic Program and Orientation.

Both Universities are vitally concerned with the excellence and the relevance of the teaching program and both have programs for providing the students practical training concurrently with the class work. Recently, both universities have sponsored seminars for the faculty on teaching methods. Reportedly, the teaching performance of all faculty is not as good as desired, and there are some areas where the curricula could be improved through the elimination of duplication and utilization of sound inter-disciplinary procedures/practices. The Universities may be expected to continue to strive for further improvement in their instructional programs.

At their beginning, the Universities adopted fully the new concepts of education involving the term (semester) scheduling system and internal grading. There has been no indication of dissatisfaction with this departure from Indian tradition. Both Universities are dedicated to the service concept and have given special stress to programs and projects which relate to important agricultural needs. At the Punjab institution, significant research findings have found prompt application and acceptance in the areas of food grains, farm implements/equipment, sugarcane, rice, plant protection, and poultry production.

8. Research and Extension

The research program at PAU has expanded over the years and has been

highly productive. It is dynamic, problem oriented, and highly relevant to the present and projected needs of the state and the nation. There are still some important areas in the University where manpower, and facilities are not available for conducting much-needed research. Attention is needed to eliminate some duplication and make more efficient use of personnel and research facilities.

The development of the extension education program in PAU has been outstanding in all India and in Asia. It is bridging the gap between research findings and the cultivator. This is evidenced by the receptiveness of the cultivators and the outstanding improvements in agriculture in the state. The program needs more emphasis on livestock, marketing and distribution, and youth activities in the future.

The research program at HAU has been well developed in veterinary science, some phases of animal science, plant breeding, plant nutrition, and horticultural crops. Large experimental lands and livestock facilities are available and other facilities for research are being developed. Much more needs to be done in developing research faculty and programs for some crucial areas and in organizing for efficient use of personnel and facilities for research. Emphasis is now being given to important problems in soil/water, dryland farming, agricultural implements/equipment, sugar cane, cotton, poultry, forage, animal diseases and hygiene, and livestock (dairy) production.

The extension education program in Haryana was developed in the same manner as in the Punjab as a part of PAU, prior to 1970. It has moved ahead very well as a part of HAU since 1970, and indications are that HAU with its strong public service orientation will be taking leadership in the country in extension education in the State of Haryana.

The regional research centers in each State permit the conducting of studies having pertinence to the different sections of the States. The district advisory/extension/service centers make possible practical demonstrations and rapid dissemination of the latest research findings.

9. Functional Professional Linkages - Domestic and Foreign

The Punjab and the Haryana Agricultural Universities have strong linkages with the Ohio State University as the result of the long-existing OSU/USAID program. Both Universities have expressed a desire to continue some type of linkage, but except for student exchanges, little is being done. Some financial assistance is needed to maintain strong linkages. Because of its state of development and its responsiveness to assistance, HAU can benefit more than PAU by a continuation of this relationship, but both need to develop such linkages with foreign universities.

PAU and HAU are active members in the Association of Indian Agricultural Universities, and both Vice-Chancellors have served as the Association President, A. L. Fletcher from HAU and M. S. Randhawa from PAU. These institutions have limited functional linkages with the Punjab University at Chandigarh, and the National Dairy Research Institute at Karnal. HAU is

cooperating in a program with the Central Government's Regional Soil Salinity Research Center at Karnal. Neither PAU nor HAU have strong formal ties with other Indian Agricultural Universities, nor inter-institutional programs of cooperative research or faculty exchange. However, professional inter-institutional relationships exist between many departments and individual faculty members. Regional and All-India conferences and workshops permit rather frequent interchange of technical information in major agricultural fields.

C. SUMMARY

The Ohio State University provided substantial assistance for 18 years, 1955-1973, to the States of Punjab, Haryana and Himachal Pradesh in India for the development of Agricultural Universities and some related agencies under a program financed by US/AID. The benefits and accomplishments under this program are considered outstanding.

Under this program advice and counsel was given before the universities were formed in laying the foundation and basis for their development. Then, after the Universities were started, advice and counsel were given on policies, plans and programs for the Universities as well as on organization, administration, and operation.

More specific assistance to the Universities and other agencies was provided by OSU faculty in India in at least 36 different subject matter areas (27 at Punjab Agricultural University, Ludhiana, and 12 at Haryana Agricultural University, Hissar). Specific assistance varied in extent for each area, but it was for development of resident instruction, extension, and research as well as for improvement of faculty, facilities, equipment and library. An important phase of the OSU program was the provision of U. S. training for a total of 106 Indian faculty, and staff members, and 13 administrators from these three states from 1955 to 1973.

Within the eleven years of its existence, the Punjab Agricultural University has achieved such a level of maturity and attainment as to have brought it recognition as one of the strong agricultural universities in India if not in all of Asia. PAU has responded well to the stimulus provided by the OSU/USAID assistance program and stands out as an example as to what is possible under such a collaborative arrangement. At the end of the project, this University possesses the necessary foundation elements upon which it should continue to maintain if not improve its present acceptable standards of performance.

At the time it was separated from the Punjab Agricultural University in 1970, the Haryana Agricultural University inherited a basic academic framework for the Colleges of Agriculture and Veterinary Science, and the College of Animal Science had just been created. A modest physical plant for these colleges was also inherited. Around this nucleus and under the impetus of strong State support and visionary and dynamic administration, HAU has developed into one of the more discussed and admired agricultural universities in India within this short three-year span.

When it existed as the Hissar campus of the Punjab Agricultural University, HAU received contributions from the OSU/USAID program in the form of (a) a limited number of Advisors/Consultants, (b) U. S. training for an appreciable number of administrators/faculty members and (c) limited equipment supplies, books, etc. Thus, HAU inherited a history of relationship with the OSU/USAID program. As indicated in the "Background" section, this relationship, with its associated OSU/USAID contributions continued throughout the period of the project.

Although young and immature, the Haryana Agricultural University has already achieved a remarkable level of distinction. The University administration has welcomed and utilized effectively the contributions made by OSU/USAID under the project, and may be expected to respond promptly and fully to additional inputs. If it proceeds along its present course, HAU will soon become one of the truly outstanding agricultural universities in the East.

Both the Punjab and Haryana Agricultural Universities have provided a healthy environment for the work of the Advisors/Consultants; consequently, each specialist has been able to utilize his/her efforts and time most effectively. The Vice-Chancellors have welcomed and/or solicited counsel, ideas, plans and programs from the Advisors/Consultants and have responded appropriately to them. The administrators/faculty members have been cooperative with and receptive to the Advisors/Consultants, thus creating conditions favorable for maximum accomplishments. Evidence reveals that the Advisors/Consultants made noteworthy and lasting contributions to their areas of specialty.

Both universities have benefitted significantly from the U. S. training program for the Indian faculty. At the time of bifurcation, the fact that many of the faculty members had received training under the project made available a much needed core of professional personnel for the new Haryana Institution. The subsequent training of additional personnel to satisfy recognized needs in the qualifications of staff was an essential element in the further rapid development of HAU and provided the needed strength for those areas at PAU weakened by bifurcation.

To a significant degree, those filling the important administrative posts of the Directorates, College and Department levels at both universities have studied abroad; consequently, they have the background to provide the required leadership. However, because of its age, the Punjab Agricultural University has the larger number of more mature and proven administrators.

Both Universities have policies and practices which have permitted the effective absorption and utilization of the returned faculty from U. S. training. Because so many of HAU's programs are just in the beginning stages of development, the opportunities for advancement of the recently returned faculty may be expected to be excellent.

The Agricultural Complex of a third university, in the State of Himachal Pradesh was provided a small amount of assistance under the OSU/AID program. While the Agricultural Complex is just beginning to function, a sound basis and philosophy was provided this program for the development

of the Agricultural Complex including the integration of three functions of academic instruction, research and extension education. Gradually, this Agricultural Complex of the University of Himachal Pradesh will become a dynamic force serving the people of the State.

All three Universities can yet profit materially by a continuation of some type of foreign training or foreign exchange program for carefully selected administrators/faculty. However, this need is far greater for the growing Haryana Agricultural University than for the more mature Punjab Institution, and still greater for the Himachal Pradesh University.

The Trust Fund Rupee Projects, generated by the OSU advisors/consultants and their counterparts, yielded significant and permanent contributions to the development of PAU and HAU. These projects have resulted in the improvement of established programs, in the initiation and development of new programs, in the betterment of facilities and equipment for teaching, research, and extension education, and in the increased competence of the faculty members who shared in developing and supervising the projects and who participated in the project-supported conferences, workshops, and seminars.

The Punjab Agricultural University has had a profound influence on agricultural development in the State. The research and extension workers contributed significantly to the success of the green revolution in the Punjab. The University has made and is making noteworthy contributions in the development of new foodgrain varieties having greater disease and pest resistance and larger yields. Its plant protection programs have been highly beneficial. A number of new farm implements/equipment have been developed and introduced by the University engineers. The graduates of the University have attained positions of responsibility in State and Central Government agencies; thus the influence of the University is wide-spread.

The Haryana Agricultural University has also had an impact on the agricultural development in the State of Haryana; and will have a much greater effect when it becomes more mature. The high level of agricultural production and farm income in Haryana has a relationship to the contributions of the University.

This OSU/AID program has been highly successful as evidenced by the development of the Agricultural Universities in India and the likelihood of continued growth and development of these institutions. In turn, these institutions are having a profound affect on the living conditions of the people in India. The Ohio State University and the United States Government learned much from the experiences in this project which should be helpful in future collaboration with the less developed countries. The Ohio State University and its faculty and students are benefitting from the association with the project. It is hoped that The Ohio State University can continue its linkage with the respective Indian Universities with which it became so closely related.

APPENDIX Table I. The Ohio State University Faculty Assigned on (a) Regional Contract 1955-1964 stationed in the states of Punjab, Haryana and Himachel Pradesh, and on (b) University contract 1964-1973 stationed at the Punjab Agricultural University and Haryana Agricultural University.

<u>Name</u>	<u>Specialty</u>	<u>Location in India</u>	<u>Appointed</u>	<u>Terminated</u>
1a T. Scott Sutton	1st Education & Research Advisor & Group Leader	Ludhiana	10/1/55	9/30/57
	2nd Administration	Ludhiana	12/29/63	3/27/64
	3rd Administration	Ludhiana	9/30/64	3/17/65
2a J. P. Schmidt	Rural Sociology	Ludhiana	10/1/55	9/30/57
3a E. L. Dakan	Poultry	Ludhiana	10/1/55	6/5/57
4a Russell O. Olson	1st Agricultural Economics	Patiala	11/1/55	10/31/57
	2nd Group Leader	Chandigarh, Ludhiana	11/1/57	10/31/59
5a Guy Dowdy	Agricultural Extension	Ludhiana	3/1/56	3/25/58
6a Olin W. Mintzer	Highway Engineering	Chandigarh	8/1/56	9/4/58
7a Dale Sieberling	Dairy Engineering	Ludhiana, Udaipur	1/1/57	3/31/57
8a Raymond E. Cray	1st Poultry	Ludhiana	5/22/57	5/21/59
	2nd, 3rd Poultry and Group Leader	Chandigarh, Udaipur	6/21/59	7/31/63
9a Harold R. Capener	Rural Sociology & Acting Group Leader	Ludhiana	5/16/58	12/31/63
10a Walter L. Slatter	Dairy Technology	Karnal	4/15/58	4/14/62
11ab Neal Carpenter	Farm Management	Ludhiana	10/28/59	7/20/65
12a Alvin L. Moxon	Animal Nutrition	Ludhiana	9/16/60	3/14/61
13a Donald D. Steward	Agricultural Economics	Ludhiana	7/17/61	7/16/63
14a George R. Gist	Agronomy	Ludhiana	10/17/61	10/16/63
15a Carl W. Hall	Dairy Engineering	Karnal	7/1/61	9/3/61
16a Paul C. Clayton	1st Poultry	Ludhiana	7/1/61	12/31/63
b	2nd Poultry	Hissar	10/15/71	6/15/72
17ab Robert E. Yoder	Agricultural Research Admin.	Ludhiana	7/1/63	6/30/65
18a Ronald B. Thompson	Registration Administration	Ludhiana	10/1/63	3/31/64
19ab Wilbur B. Wood	Extension Education & Group Leader	Ludhiana, Hissar & Udaipur	10/1/63	12/31/67
20ab Samuel G. Huber	Agricultural Engineering	Ludhiana	9/16/64	3/15/65
21ab James P. Chapman	1st Publications and Information	Ludhiana	8/1/64	7/31/66
	2nd Audio-Visual Aids - Communication	Ludhiana	1/1/70	4/30/70
22b Alden R. Winter	Poultry	Ludhiana	7/1/65	7/31/67
23b Charles V. Moore	Agricultural Economics	Ludhiana	6/16/65	6/23/67

Table I, continued

<u>Name</u>	<u>Specialty</u>	<u>Location in India</u>	<u>Appointed</u>	<u>Terminated</u>	
24b	Edna R. Kaufman	Home Economics	Ludhiana	7/1/55	6/30/67
25b	Albert E. Darlow	Animal Science	Hissar	9/22/66	10/22/66
26b	Walter R. Krill	Veterinary Medicine	Hissar	2/15/67	3/31/67
27b	Freeman S. Howlett	Horticulture	Ludhiana	2/21/67	4/18/67
28b	Oliver J. Worthington	Food Technology	Ludhiana	6/14/67	7/18/68
29b	Maria S. Friesen	Home Science	Ludhiana	7/1/67	7/5/69
30b	Harvey R. Krueger	1st Entomology-Toxicology	Ludhiana	7/1/67	7/20/69
		2nd Entomology-Toxicology	Ludhiana	2/20/72	3/21/72
31b	Robert M. Porter	Animal Physiology & Acting Group Leader	Hissar	8/28/67	4/19/68
32b	Louis C. Knorr	Citrus Virology	Ludhiana	10/15/68	11/26/69
33b	Cecil A. Lamb	1st Seed Multiplication & Distribution & Chief of Party	Ludhiana	11/4/67	12/4/67
		2nd	Ludhiana, Hissar	4/16/68	9/30/71
34b	Nicholas Holowaychuk	Soils Physics	Hissar & Ludhiana	5/17/68	8/16/68
35b	George S. Taylor	1st Soils Physics	Ludhiana	10/8/68	12/15/68
		2nd Soils Physics	Hissar	1/13/70	3/31/70
36b	Garth A. Cahoon	Horticultural & Nutritional needs	Ludhiana	10/1/68	12/31/68
37b	Donald E. Herr	Agronomy, Weed Control	Hissar	7/21/69	8/15/70
38b	R. Bruce Curry	Agricultural Engineering, Soil & Water Management	Ludhiana, Hissar	9/23/69	11/12/69
39b	John W. Hibbs	Animal Nutrition	Hissar	11/7/69	11/30/71
40b	Joan E. Herr	Home Science - Dietetics	Ludhiana	1/15/70	5/31/70
41b	Raymond A. Bailey	Farm Credit	Ludhiana	11/16/70	6/15/71
42b	Fanchon Warfield	Home Science	Ludhiana	3/10/71	6/9/71
43b	Ira A. Gould	Chief of Party	Udaipur (Ludhiana, Hissar)	10/1/71	12/31/72
44b	Donald C. Abbott	Food Science & Technology	Ludhiana	7/2/71	7/1/72
45b	Robert F. Cross	Veterinary Science-Mycology	Ludhiana, Hissar	11/21/71	2/12/72
46b	Delbert M. Byg	Agricultural Engineering	Hissar	1/31/72	3/30/72
47b	Garth W. Volk	Agronomy - Soils	Ludhiana, Hissar	2/11/72	3/10/72
48b	George F. Hall	Soil Survey & Classification	Ludhiana	2/20/72	6/30/73

Note: a following the faculty member denotes assignment on the regional contract, Sept. 12, 1955 to Oct. 31, 1964
b following the faculty member denotes assignment on the Contract AID/147 Punjab and Haryana Agricultural Universities, Nov. 1, 1964 to June 30, 1973.

APPENDIX Table 2. The Ohio State University Faculty(a)1955-1964, on Regional Contract in the State of Rajasthan, (b) 1964-72 on the University of Udaipur Contract, AID-148

Name	Specialty	Location in India	Arrived in India	Departed India
1a T. Scott Sutton	Group Leader	Ludhiana	10/6/55	8/11/57
2a Charles L. Blackman	Dairy Production	Bikaner & Udaipur	10/6/55	7/28/57
3a J. D. Grossman	Veterinary Anatomy	Bikaner	7/56	5/11/58
4a Dale Seiberling	Dairy Engineering	Ludhiana & Udaipur	1/7/57	3/17/57
5a Russell O. Olson	Group Leader & Agr. Economics	Ludhiana	11/57	9/5/59
6a Delbert M. Byg	Agr. Engineering	Udaipur	5/6/58	6/30/64
7a Willard F. Guard	Veterinary Surgeon	Bikaner	8/28/58	4/10/60
8a Donald J. Hoff	Soils	Udaipur	7/1/59	5/63
9a Raymond E. Cray	Group Leader & Agr. Education	Chandigarh	8/19/59	7/10/63
10a Donald B. Robinson	Extension Education	Udaipur	7/12/62	5/15/64
b Donald B. Robinson	Extension Education	Udaipur	10/1/65	9/30/67
11a Robert M. Reeser	Farm Management	Udaipur	10/4/62	8/14/64
12ab Wilbur B. Wood	Group Leader	Ludhiana	10/3/63	5/30/65
13ab Paul C. Clayton	Poultry Science & Acting Group Leader	Udaipur	2/7/64	2/21/68
14a Ronald B. Thompson	Registrar, Administration	Udaipur	4/1/64	8/30/64
15ab Fanchon Warfield	Home Science	Udaipur	8/1/64	7/23/71
16b Ralph D. Barner	Vet. Science & Acting Group Leader	Bikaner	6/17/65	1/19/71
17b Robert E. Yoder	Agr. Research Admin.	Udaipur	8/1/65	6/30/67
18b Leonard D. Bayer	Chief of Party & Admin.	Udaipur	9/19/65	8/13/67
19b Lawrence A. Best	Extension Education	Udaipur	10/16/67	2/14/71
20b George R. Gist	Chief of Party & Admin.	Udaipur	10/29/67	1/31/70
21b Leland O. Drew	Agr. Engineering	Udaipur	2/1/68	6/23/71
22b William A. Wayt	Agr. Economics	Udaipur	1/3/69	3/21/69
23b George R. Johnson	Animal Science	Udaipur	1/12/69	2/23/69

<u>Name</u>	<u>Specialty</u>	<u>Location in India</u>	<u>Arrived in India</u>	<u>Departed India</u>
24b Francille Maloch Firebaugh	Home Management	Udaipur	1/15/70	3/24/70
25b William E. Krauss	Research Admin.	Udaipur	2/2/70	4/15/70
26b Garth A. Cahoon	Horticulture - Folier Analysis	Udaipur	2/2/70	4/23/70
27b Ira A. Gould	Chief of Party & Admin.	Udaipur	9/4/70	9/30/72*

- * Stayed in India to December 13, 1972 to help in closing of project during which time he was supported under another OSU Contract US/AID-147.

NOTE: Those faculty with (a) following the number were on the Regional Contract during the period September 12, 1955 to October 31, 1964. Those with (b) following the number were on the University of Udaipur Contract AID-148 during the period Nov. 1, 1964 to September 30, 1972.

APPENDIX Table 3. The Ohio State University
Administration of
International Agricultural Programs -- India

<u>A. SENIOR ADMINISTRATORS</u>	<u>DATES</u>	<u>TRIPS TO INDIA</u>
President Howard L. Bevis	1955-1956	--
President Novice G. Fawcett	1956-1972	1960
President Harold L. Enarson	1972-Present	--
Dean, College of Agriculture, Leo L. Rummell	1955-1960	1955, 1956
Dean, College of Agriculture & Home Economics, Roy M. Kottman	1960-Present	1962, 1968
<u>B. CAMPUS COORDINATORS</u>	<u>DATES</u>	<u>TRIPS TO INDIA</u>
Carl R. Reese, Coordinator	10/1/55-3/30/57	1956
Richard H. Bohning, Coordinator	10/1/57-6/30/64	1956, 1961, 1963
Raymond C. Cray, Coordinator	7/1/64-8/31/66	1965, 1966
Mervin G. Smith, Asst. Dean & Coordinator	9/1/66 - Present	1967, 1968, 1969, 1970, 1971, 1972
Harold D. Bauman, Asst. Coordinator	9/1/66-10/15/68	--
John L. Parsons, Asst. Coordinator	12/1/68 - Present	1971

APPENDIX Table 4. The Ohio State University
Executive Visitors to India
on US/TCA or US/AID Contract - 1955-1972

<u>DATES OF TRIP TO INDIA</u>	<u>NAME</u>	<u>TITLE</u>
A. PRE-CONTRACT, 1955		
1955	Leo L. Rummell	Dean, College of Agriculture & Home Economics & Director, Ohio Agriculture Experiment Station
1955	T. S. Sutton	Associate Dean, College of Agriculture & Home Economics
B. REGIONAL CONTRACT, 1955-1964		
1956	Leo L. Rummell	Dean, College of Agriculture & Home Economics & Director, Ohio Agriculture Experiment Station
1956	C. R. Reese	Campus Coordinator
1957-1958	Richard H. Bohning Carlton S. Dargusch	Campus Coordinator O. S. U. Trustee
1959	T. S. Sutton	Associate Dean, College of Agriculture & Home Economics
1960	Novice G. Fawcett	President, The Ohio State University
1961	Richard H. Bohning	Asst. Dean, College of Agriculture & Home Economics & Campus Coordinator
1961	Forest G. Ketner	O. S. U. Board of Trustees
1962	Roy M. Kottman	Dean, College of Agriculture & Home Economics, & Director, Ohio Agricultural Research & Development Center
1962	William E. Krauss	Associate Director, Ohio Agricultural Research & Development Center
1963	Richard H. Bohning	Assistant Dean & Campus Coordinator, College of Agriculture & Home Economics
1963	Wilbur B. Wood	Director, Ohio Cooperative Extension Service

Table 4, Continued

<u>DATES OF TRIP TO INDIA</u>	<u>NAME</u>	<u>TITLE</u>
C. UNIVERSITY OF UDAIPUR AND THE PUNJAB AGRICULTURAL UNIVERSITY CONTRACTS		
1964	T. S. Sutton	Associate Dean, College of Agriculture & Home Economics
1964	Ronald B. Thompson	Executive Dean & Registrar, OSU
1965	T. S. Sutton	Associate Dean, College of Agriculture & Home Economics
1966	Raymond E. Cray	Campus Coordinator
1967	Mervin G. Smith	Asst. Dean & Campus Coordinator, Int'l. Affairs, College of Agriculture and Home Economics
1967	Austin E. Ritchie	Assistant Dean, Academic Affairs, College of Agriculture & Home Economics
1968	Roy M. Kottman	Dean, College of Agriculture & Home Economics, Director, Ohio Agricultural Research & Development Center, and Director, Ohio Cooperative Extension Service.
1968	William E. Krauss	Associate Director, Ohio Agricultural Research & Development Center
1969	Mervin G. Smith	Asst. Dean & Campus Coordinator, Int'l. Affairs, College of Agric. & Home Econ.
1969	James M. Beattie	Associate Director, Ohio Agricultural Research and Development Center
1969	Lois A. Lund	Associate Dean, College of Agriculture and Director, School of Home Economics
1969	Lois Gilmore	Associate Director, School of Home Economics
1970	Mervin G. Smith	Asst. Dean & Campus Coordinator, Int'l. Affairs, College of Agric. & Home Econ.
1970	Ira A. Gould	Chairman, Dept. of Dairy Technology
1971	Mervin G. Smith	Asst. Dean & Campus Coordinator, Int'l. Affairs, College of Agric. & Home Econ.
1971	Robert W. Teater	Associate Dean, College of Agriculture and Home Economics
1972	Mervin G. Smith	Asst. Dean & Campus Coordinator, Int'l. Affairs, College of Agric. & Home Econ.
1972	Orlo L. Musgrave	Associate Director, Ohio Cooperative Extension Service.

APPENDIX Table 5. U. S. Training of Individuals from Punjab, Haryana and Himachal Pradesh Programmed, Managed and Supported by The Ohio State University on Regional Contract 1955-64 and University Contract 1964-73.

A. FROM GOVERNMENT AGRICULTURAL COLLEGE AND LUDHIANA CAMPUS OF PUNJAB AGRICULTURAL UNIVERSITY

Name	Field of Training	Period of Training No. Months	Date	Degree/ Program	Present Position
<u>On OSU Regional TCA Contract - 1955-64</u>				OSU or as indicated	
1. Jaswant S. Kanwar	Agronomy	12	1957-58	Special	Int'l. Institute, Hyderabad, India
2. Amar Singh Mann	Poultry Science	12	1957-58	Special	Business, New Delhi
3. R. N. Pal	Dairy Science	12	1958-59	M. S.	HAU
4. G. S. Bedi	Agr. Engineering	9	1958-59	Special	Himachal Pradesh, U. of Palampur
5. N. S. Dhesi	Agronomy	9	1958-59	Special	U.S.A.
6. Dalbir Singh	Poultry Science	12	1960-61	M. S.	PAU
7. K. S. Mann	Farm Management	13	1960-61	Ph.D.	FAO, Rome
8. Raghbir Singh	Farm Management	12	1960-61	M. S.	PAU
9. C. R. Sharma	Agronomy	15	9/60-12/61	M. S.	HAU
10. Jaswant S. Chohan	Plant Pathology	24	1961-63	Ph.D.	PAU
11. D. S. Dhaliwal*	Animal Breeding	18	1961-63	M. S.	PAU
12. Gurbakhsh S. Gill	Agronomy	24	1961-63	Ph.D.	PAU
<u>On Both Regional and University Contract</u>					
13. B. S. Balam	Soil Science	30	9/62-3/65	Ph.D.	FAO
14. D. S. Bains	Agronomy	24	1962-64	Ph.D.	PAU
15. J. C. Bakhshi	Horticulture	36	1963-66	Ph.D.	PAU
16. B. S. Ahluwalia	Dairy Science	24	9/63-65	Ph.D.	PAU
17. A. S. Atwal	Biochemistry	24	1963-66	Ph.D.	PAU
18. P. S. Bedi	Plant Pathology	30	9/63-3/66	Ph.D.	PAU
19. D. S. Chahal	Plant Pathology	30	9/63-3/66	Ph.D.	PAU
20. N. S. Arora	Forage Crop Production	27	9/64-3/67	Ph.D.	HAU
21. Hardial Singh Gill	Botany	42	9/64-2/68	Ph.D.	PAU
22. Nirmal Tej Singh	Soils	38	9/64-10/67	Ph.D.	PAU
				U. of Calif.	

Appendix Table 5, continued

Name	Field of Training	Period of Training		Degree/ Program	Present Position
		No. Months	Date		
<u>On University Contract</u>					
23. R. S. Vasudeva	Plant Genetics	25	8/65-9-67	M. S.	PAU
24. Sukhdev Singh Gill	Dairy Science	36	9/65-9/68	Ph.D.	PAU
25. Jagjit S. Jawanda	Horticulture	31	9/65-4/68	Ph.D.	PAU
26. D. S. Sidhu	Agr. Economics	12	9/66-9/67	Joint	PAU
27. R. S. Kanwar	Agronomy	12	9/66-9/67	Joint	PAU
28. Sayta Pal Kapoor	Citrus Virology	52	9/67-1/72	Ph.D.	PAU
29. Dilbagh S. Kooner	Dairy Science	24	9/67-9/69	U. of Calif. Ph.D.	U.S.A.
30. A. S. Sandhu	Extension Communications	12	9/67-9/68	Joint	PAU
31. Kirpal K. Singh	Agr. Extension	5	7/68-11/68	Post-Doc.	PAU
32. Sardara S. Johl	Agr. Economics	5	7/68-11/68	Post-Doc.	PAU
33. Jagjit K. Dhesi	Home Science	31	8/68-3/71	Ph.D.	PAU
34. Mehar Singh	Dairy Science	44	8/68-4/72	Ph.D.	PAU
35. Tara C. Jain	Library Science	3	9/68-12/68	Special	PAU
36. S. L. Chopra	Biochemistry-Pesticide Residue	4	9/69-1/70	Post-Doc.	PAU
37. A. S. Kahlon	Economic Development	4	11/69-2/70	Post-Doc.	PAU
38. G. S. Sekhon	Soils	4	1/70-5/70	Post-Doc.	PAU
39. I. S. Bhatia	Biochemistry	8	3/70-10/70	Post-Doc.	PAU
40. G. S. Dhillon	Agronomy	36	12/70-12/73	Ph.D.	PAU
41. Gurbachan Singh	Agr. Economics	43	12/70-6/74	Ph.D.	PAU
42. Sumita Roy	Home Science	29	12/70-4/73	Ph.D.	PAU
43. H. S. Mavi	Agronomy-Climatology	5	2/71-7/71	Post-Doc.	PAU
44. A. S. Rangri	Food Processing	5	2/71-6/71	Special	PAU
45. C. L. Arora	Agronomy	4	9/71-1/72	Post-Doc.	PAU
46. R. N. Kaul	Agr. Engineering	4	9/71-1/72	Post-Doc.	PAU
47. G. S. Khatra	Veterinary Anatomy	37	8/71-9/74	Ph.D.	PAU
48. G. S. Gill	Dairy Science	30	9/71-3/74	Col. State U. Ph.D.	PAU
49. V. K. Chaudhary	Food Technology	36	9/71-9/74	Ph.D.	PAU
50. J. S. Ghuman	Veterinary Medicine	33	9/71-6/74	Ph.D.	PAU
				U. of Calif.	

Appendix Table 5, continued

Name	Field of Training	Period of Training		Degree/ Program	Present Position
		No. Months	Date		
51. V. V. N. Murty	Agr. Engineering	36	9/71-9/74	Ph.D.	PAU
52. A. K. Srivastava	Agronomy-Seed Physiology	5	10/71-2/72	Post-Doc.	PAU
53. S. S. Malhotra	Home Science	36	12/71-12/74	Ph.D.	PAU
54. Manjeet Singh	Home Science	33	3/72-12/74	Ph.D.	PAU

* Was originally from The University of Udaipur

Table 5., continued

B. FROM HARYANA AGRICULTURAL UNIVERSITY AND PREVIOUS COLLEGES AT HISSAR

Name	Field of Training	Period of Training		Degree/ Program OSU or as indicated	Present Position
		No. Months	Date		
<u>On OSU Regional TCA Contract, 1955-64</u>					
1. Karem Chand	Veterinary Physiology	2	1957	Special	Unknown
2. Ajit Singh	Veterinary Physiology	12	1957-58	M. S.	PAU
3. Balbir Singh	Veterinary Pharmacology	33	1958-59	M. S.	PAU
4. O. P. Gautam	Veterinary Medicine	12	12/58-12/59	Ph.D.	HAU
5. Ajit Singh Mahajan	Veterinary Surgery	12	1958-59	Special	Punjab State Govt.
6. Harpal Singh Bal	Veterinary Anatomy	12	1958-59	Special	U.S.A.
7. Lachman S. Hundal	Animal Nutrition	12	1959-60	M. S.	PAU
	Animal Nutrition	34	9/66-7/69	Ph.D.	
8. S. S. Saini	Animal Nutrition	12	1959-60	Special	Haryana State Govt.
9. S. S. Sahota	Animal Nutrition	12	1960-61	M. S.	PAU
10. Lekh Raj Chawla	Dairy Technology	12	1961-62	Special	HAU
11. Radhey M. Acharya	Animal Breeding	15	1961-62	M. S.	Rajasthan
<u>On Both Regional and University Contract</u>					
12. D. P. Sharma	Production Physiology	18	9/63-3/65	M. S.	Unknown
13. D. S. Kalra	Food Hygiene	30	9/63-3/66	Ph.D.	HAU
14. Surjit S. Dhillon	Veterinary Microbiology	27	9/64-12/66	Ph.D.	PAU
15. Naunihal S. Ruprah	Parasitology	30	9/64-3/67	Ph.D.	HAU
16. Subhan C. Datt	Veterinary Surgery	18	9/64-3/66	M. S.	HAU
<u>On University Contract</u>					
16b. Subhan C. Datt	Veterinary Medicine	46	8/68-6/72	Ph.D.	HAU
17. F. C. Malhotra	Poultry Pathology	39	9/65-12/68	Ph.D.	HAU
				Purdue U.	
18. Prem Dutt Malik	Parasitology	39	9/65-12/68	Ph.D.	HAU
19. Lachman D. Dhingra	Veterinary Anatomy	40	9/65-1/69	Ph.D.	HAU
20. Jodh Singh Saini	Soil Science	12	9/66-9/67	Joint	Unknown

Table 5, continued

Name	Field of Training	Period of Training		Degree/ Program	Present Position
		No. Months	Date		
21. D. P. Sharda	Swine Production	51	1/67-4/71	Ph.D.	Unknown
22. Rameshwar D. Sharma	Sheep Production	15	9/67-12/68	M. S.	PAU
23. R. K. Paul Gupta	Veterinary Pathology	42	9/67-3/71	Ph.D.	HAU
24. Dara S. Bhatti	Nematology	33	8/68-5/71	Ph.D.	HAU
25. S. C. Chakravarti	Food Science	12	8/68-8/69	N. C. State U. Post-Doc.	HAU
26. Jai B. Chaudhury	Radiation Genetics	18	8/68-2/70	U. of Calif. Post-Doc.	HAU
27. Bhagwan D. Garg	Veterinary Pharmacology	46	8/68-6/72	Atomic Energy Commission Oak Ridge, Tenn.	HAU
28. Moti Lal Madan	Dairy Science	32	8/68-4/71	Ph.D.	HAU
29. Jai S. Sharma	Sheep Breeding	33	9/69-6/73	Ph.D.	HAU
30. Ramesh C. Gupta	Vet. Obstetrics & Gynecology	32	9/69-5/72	Ph.D.	HAU
31. O. P. Nangia	Veterinary Physiology	5	3/70-7/70	U. of Minn. Post-Doc.	HAU
32. I. P. Singh	Veterinary Bacteriology	5	3/70-7/70	Post-Doc.	HAU
33. Y. P. Singh	Extension Education	7	3/70-9/70	Post-Doc.	HAU
34. R. D. Parashar	Plant Pathology	12	1/71-1/72	Post-Doc.	HAU
35. Mahendra Singh	Agronomy	12	1/71-1/72	Post-Doc.	HAU
36. V. K. Agrawal	Agronomy	12	3/71-3/72	Post-Doc.	HAU
37. J. S. Balan	Entomology	36	3/71-3/74	U. of Calif. Ph.D.	HAU
38. Satish Chandra	Agronomy	6	8/71-2/72	Post-Doc.	HAU
39. S. P. Singal	Dairy Science	36	9/71-9/74	U. of Calif. Ph.D.	HAU
40. Umed Singh	Biostatistics	24	9/71-9/73	Ph.D.	HAU
41. S. K. Agarwal	Agronomy	12	9/71-9/72	(Not Completed) Joint	HAU
42. S. P. S. Karwasra	Agronomy	7	10/71-4/72	Post-Doc.	HAU
43. I. S. Singh	Vitaculture	24	12/71-12/73	Ph.D.	HAU
				U. of Calif.	

Table 5, Continued

C. FROM NATIONAL DAIRY RESEARCH INSTITUTE, KARNAL

Name	Field of Training	Period of Training		Degree/ Program OSU	Present Position
		No. Months	Date		
<u>On OSU Regional TCA Contract, 1955-64</u>					
1. K. C. Mayer	Dairy Technology	12	1958-59	Special	NDRI
2. R. V. Rao	Dairy Chemistry	12	1959-60	Special	NDRI
3. A. P. Sharma	Dairy Production	12	1959-60	Special	NDRI
4. A. K. Banerjee	Dairy Technology	18	1960-62	M. S.	NDRI
5. I. N. Manchanda	Dairy Production	18	1961-63	M. S.	NDRI
6. B. K. Chakraborty	Dairy Technology	21	1961-63	M. S.	NDRI

D. FROM DEPARTMENT OF AGRICULTURE OF HIMACHAL PRADESH AND AGRICULTURAL COMPLEX
OF HIMACHAL PRADESH UNIVERSITY

Name	Field of Training	Period of Training		Degree/ Program, OSU	Present Position
		No. Months	Date		
<u>On OSU Regional TCA Contract, 1955-64</u>					
1. Atma Ram Chauhan	Horticulture	12	1957-58	Special	Unknown
2. B. H. Patel	Agronomy	12	1958-59	Special	Unknown
<u>On University Contract</u>					
3. N. C. Mahajan	Food Technology	6	3/71-9/71	Post-Doc.	H. P. University Palampur

APPENDIX Table 6. U. S. Training of Individuals from Rajasthan on Regional Contract
October, 1955 to October 31, 1964
Programmed, Managed and Supported by OSU

Name	Field of Training	Period of Training		Degree/ Program	Present Position
		No. Months	Date		
1. K. N. Nag	Agr'l. Engineering	12	1957-58	M. S.	Dean, CTAE, Udaipur
		24	1966-67	Ph.D.	
2. J.H. Solanki	Embroyology & Anatomy	12	1957-58	M. S.	Expired
3. K. Rathore	Extension	6	1958	Special	Reader, RCA, Udaipur
4. P. D. Mathur	Veterinary Medicine	12	1958-59	M. S.	Lecturer, Bikaner
5. M. K. Doshi	Preventive Medicine	12	1958-59	M. S.	Rajasthan State Govt.
6. C. P. Trivedi	Agronomy	12	1958-59	M. S.	Assoc. Reader, RCA, Udaipur
7. P. B. Lal	Soils	12	1958-59	M. S.	Assoc. Reader, RCA, Udaipur
8. A. P. Asopa	Animal Physiology	12	1958-59	M. S.	Lecturer, Bikaner
9. M. L. Chaudhary	Farm Organization	4	1958	Special	Rajasthan State Govt.
10. M. L. Singhvi	Library Science	12	1959-60	M. S.	Expired
11. P. N. Mehrotra	Bacteriology & Pathology	12	1959-60	M. S.	Professor, Bikaner
12. R. S. Chaudhary	Farm Organization	4	1959	Special	Rajasthan State Govt.
13. D. P. Gupta	Poultry Development	6	1959	Special	Rajasthan State Govt.
14. B. S. Rathore	Agricultural Economics	12	1959-60	M. S.	Reader, RCA, Udaipur
15. K. R. Lodha	Parasitology	12	1959-60	M. S.	Reader, Bikaner
16. Balbir Singh	Poultry	12	1959-60	M. S.	Reader, Bikaner
17. P. M. Chatur	Farm Organization	4	1960	Special	Rajasthan State Govt.
18. P. D. Bhargava	Breeding & Production of Hybrid Maize	12	1960	M. S.	Rajasthan State Govt.
19. Devendra Sharma	Agr'l. Information	4	1960	Special	Rajasthan State Govt.
20. S. S. Verma	Food Production & Preservation	12	1960-61	M. S.	Lecturer, RCA, Udaipur
21. J. F. Correia	Irrigation	12	1960-61	M. S.	Reader, CTAE, Udaipur
22. C. S. Mathur	Animal Nutrition	12	1960-61	M. S.	Reader, Bikaner
23. R. K. Muralia	Agr'l. Engineering	24	1960-62	Ph.D.	Reader, Jobner
24. J. S. Dhaliwal	Animal Breeding	18	1961-63	M. S.	Unknown
25. B. S. Jerry	Dairy Manufacturing	24	1961-63	M. S.	Lecturer, RCA, Udaipur
26. S. P. Ohri	Dairy Manufacturing	21	1961-63	M. S.	Reader, Bikaner
27. K. C. Pundrik	Vegetable Production	18	1962-64	M. S.	Lecturer, RCA, Udaipur
28. R. K. Patel	Farm Management	25	1962-64	Ph.D.	Ext. Officer, IARI, Delhi

Table 6, continued

Name	Field of Training	Period of Training		Degree/ Program	Present Position
		No. Months	Date		
29. P.B. Khatri	Dairy Technology	10	1962-63	Special	Lecturer, RCA, Udaipur
30. R.N. Muralia	Weed Control	18	1962-64	M. S.	Lecturer, RCA, Udaipur
31. K.K.S. Chauhan	Agr'l. Marketing	22	1962-64	Ph.D.	Institute of Mgmt. Ahmedabad
32. H.S. Jhala	Crop Production	4	1962	Special	Rajasthan State Govt.
33. S.V. Jain	Survey & Reclamation	6	1963	Special	Rajasthan State Govt.
	Saline & Alkaline Soils				
34. B.B. Roy	Soil Survey & Land Use	4	1963	Special	Rajasthan State Govt.
35. K.L. Rao	Vet. Public Health	18	1963-65	M. S.	Lecturer, Bikaner
36. P.R. Jatkar	Microbiology	21	1963-65	M. S.	Lecturer, Bikaner
37. F.C. Thapan	Dairy Husbandry	30	1963-66	Ph.D.	Reader, Jobner
38. B.K. Kaul	Plant Genetics	30	1963-66	Ph.D.	Reader, RCA, Udaipur
39. D.K. Garg	Agronomy	27	1963-65	Ph.D.	Unknown
40. N.C. Bhurat	Extension Education	9	1964	Special	Rajasthan State Govt.
41. K.L. Sharda	Agricultural Extension	4	1964	Special	Rajasthan State Govt.
42. R.S. Vijay	Agricultural Extension	6	1964	Special	Rajasthan State Govt.
43. Mikat Behari	Irrigation & Drainage	6	1964	Special	Rajasthan State Govt.
44. O.P. Mathur	Forestry	6	1964	Special	Rajasthan State Govt.
45. S.P. Seth	Soil Survey & Land Use	6	1964	Special	Rajasthan State Govt.
46. B.M. Trivedi	Watershed Management	6	1964	Special	Rajasthan State Govt.
47. J.C. Sharma	Entomology	15	1964-65	Special	Reader, RCA, Udaipur
48. S.N. Saxena	Bio-Chemistry	13	1964-65	Special	Professor, RCA, Udaipur
49. K.S. Singh	Agricultural Chemistry	12	1964-65	Special	Reader, Jobner
50. S.L. Mathur	Extension Education	24	1964-66	Ph.D.	Lecturer, RCA, Udaipur
51. H.C. Sharma	Horticulture	30	1964-67	Ph.D.	Reader, Jobner
52. B.S. Sirdhana	Plant Pathology	30	1964-67	Ph.D.	Reader, RCA, Udaipur
53. M.L. Jain	Agr'l. Engineering	18	1964-66	M. S.	Reader, Jobner
54. C.B. Vyas	Preventive Medicine	18	1964-66	M. S.	Lecturer, Bikaner
55. Amrit Lal	Sheep Husbandry	36	1964-68	M. S.	Reader, Bikaner
56. Anand Prakash	Animal Breeding	18	1964-66	Ph.D.	Reader, RCA, Udaipur

APPENDIX Table 7. Indian University Administrative Visitors to The Ohio State University

A. REGIONAL CONTRACT, 1955-64

<u>Name</u>	<u>Title</u>	<u>Dates of Trip to OSU</u>
1. N. P. Thaper	Vice-Chancellor, Punjab Agricultural University	March-May, 1963
2. Gursham Singh	Dean, College of Agriculture Punjab Agricultural University Ludhiana	March-May, 1963
3. R. N. Mohan	Dean, College of Veterinary Science, Punjab Agricultural University, Hissar	March-May, 1963
4. J. S. Kanwar	Director of Research Punjab Agricultural University Ludhiana	March-May, 1963
5. A. Rathore	Dean, Rajasthan College of Agriculture, Udaipur	March-May, 1963
6. N. Prasad	Dean, S.K.N. College of Agriculture, Jobner	March-May, 1963
7. Mohan Singh	Dean, College of Veterinary and Animal Science, Bikaner	March-May, 1963

B. UNIVERSITY CONTRACT - PUNJAB, HARYANA AND HIMACHAL PRADESH - 1964-73

1. M. S. Randhawa	Vice-Chancellor, PAU	November 19-25, 1968 August 8-9, 1969
2. Suhkdev Singh	Director of Research, PAU	July, 1969
3. A. S. Atwal	Dean, College of Agriculture, PAU	July, 1969
4. C. M. Jacob	Dean, College of Agricultural Engineering, PAU	July, 1969
5. O. S. Bindra	Professor or Head, Department of Entomology, PAU	April, 1970
6. K. Pradhau	Professor, Animal Nutrition HAU	May, 1970
7. A. L. Fletcher	Vice-Chancellor, HAU	Oct.-Nov., 1970
8. H. R. Kalia	Dean, Agriculture, Himachal Pradesh	April - June, 1971
9. P. S. Gill	Agricultural Engineering, PAU	April, 1972

APPENDIX Table 8. Technical and Professional Publications by OSU Faculty Members Who Worked in India on Northwest Regional Contract and University Contracts (OSU/AID Nesa 147 and 148) from 1955 to 1973.

Title	Date	Publisher	Authors (OSU underlined)	No. Pages
1. Anatomy of a Camel	1958	Book Manuscript	<u>J. D. Grossman</u>	400 est.
2. Laboratory Manual, B. Sc., Part II, Agricultural Chemistry	1961	Mimeographed, Univ. of Udaipur	<u>D. J. Hoff</u>	75 est.
3. Extension Farm Planners' Reference Manual	1962	Mimeographed, Punjab Agric. Univ.	<u>Neal R. Carpenter</u>	40 est.
4. Simple Bullock-Drawn Implements for Efficient Irrigation	1964	College of Agr., Jobner Univ. of Udaipur	<u>A. M. Michael</u> <u>G. C. Knierim</u> <u>R. M. Reeser</u>	16
5. How to Improve Irrigation Farming in India	1965	College of Agr., Jobner Univ. of Udaipur	<u>A. M. Michael</u> <u>R. M. Reeser</u> <u>G. C. Knierim</u>	60
6. The Development of Agricultural Engineering in India	1965	American Society of Agric. Engineers	<u>D. B. Byg</u>	5 est.
7. Passing the Word (Writing for Publication)	1965	OSU/USAID/PAU Printed by Mascha'l Printing Press, Kharar	<u>James P. Chapman</u>	24
8. Proceedings of the Second Workshop on Agricultural Universities of India	1965	USAID/OSU Contract Team Printed by Kapoor Art Press, New Delhi	<u>James P. Chapman</u> , Edited	330
9. The Second Year, PAU, A Resource Book for the Indian Agricultural University Workshop	1965	PAU/OSU/USAID	<u>James P. Chapman</u>	28
10. The Agricultural University and Communication in a Developing Society	1966	Punjab Agric. Univ. Press	<u>James P. Chapman</u>	128
11-20 Northern India Poultry Production - 10 publications on following subjects:	1966-68	Punjab Agric. Univ.	<u>A. R. Winter</u> & others	
1. Poultry Industry				100 est.
2. Housing				
3. Feeding				

Appendix Table 8, continued

Title	Date	Publisher	Authors (<u>OSU underlined</u>)	No. Pages
11-20 4. Breeding 5. Incubation 6. Egg Marketing 7. Marketing 8. Disease 9. Business Management 10. Miscellaneous Poultry				
21. Directory of the Larger Poultry Farms in Haryana State & Delhi District	1967	Punjab Agric. Univ.	<u>A.R. Winter</u> <u>Updesh Singh</u>	6 est.
22. Your Career in Agriculture & Related Areas	1967	Gutenberg Printing Works, New Delhi	<u>Wilbur B. Wood</u> & others	6 est.
23. The Implementation of Agricultural Engineering Extension in India	1968	American Society of Agr'l. Engineers	<u>D. B. Byg</u>	7 est.
24. Foliar Analysis for Horticultural Fruit Crops	1968	The Punjab Horticultural Journal	<u>G. A. Cahoon</u>	7
25. Prospects and Possibilities of Pesticide Fertilizer Mixtures in Agriculture	1969	Indian Chemical Manufacturer, Vol. 7, No. 6	<u>H. R. Krueger</u> <u>R. P. Chaula</u>	3
26. Soil Treatment with Insecticides - Some Useful Consideration	1959	Farm Journal, Vol. 10	<u>H. R. Krueger</u> <u>R. P. Chaula</u>	3
27. Persistence of Formothion and Phorate on Brassica Plants	1969	Journal of Economic Entomology 64	<u>N. Chaud</u> <u>M. L. Saini</u> <u>H. R. Krueger</u>	4
28. Excellent Feed for Buffaloes and Cows - High Quality Lucerne	1970	Progressive Farming, India	<u>J. W. Hibbs</u> <u>S. S. Gill</u>	5 est.
29. Feed Value of Forage Determined by Maturity at Harvest	1970	Progressive Farming, India	<u>J. W. Hibbs</u> <u>S. S. Gill</u>	5 est.
30. Selection of Insecticides for Insect Control	1970	Farmer and Parliament Magazine	<u>R. P. Chaula</u> <u>H. R. Krueger</u>	5

Appendix Table 8, continued

Title	Date	Publisher	Authors (OSU underlined)	No. Pages
31. Estimation of Endrin Residues in/on Bhindi Fruits by Gas Chromatography	1970	Indian Journal of Entomology	<u>J.S.Bhalla</u> <u>H.R.Krueger</u> <u>O.S.Bindra</u> <u>S.N.Deshmukh</u>	5 est.
32. Citrus Decline in India, Causes and Control	1970	Punjab Agricultural Univ. Ohio State University USAID	<u>L.C.Knorr</u> & others	94
33. Push-Type Power Sprayer	1970	Indian Farming, ICAR, New Delhi	<u>Donald E. Herr</u> <u>A.P.Sharma</u>	1 1/2
34. Experimental Plot Sprayer Developed at Hissar	1970	Punjab Agri. Univ. News	<u>Donald E. Herr</u>	4 est.
35. Agricultural Engineering Education in India - Its Problem and Challenges	1970	Indian Society of Agr. Eng.	<u>Leland O. Drew</u>	6 est.
36. Estimating the Monetary Value of Forages	1971	ICAR	<u>J.W.Hibbs</u>	5 est.
37. A Method of Making Berseem Hay Without Loss of Leaves - for the Village Farmer	1971	Indian Farming ICAR, New Delhi	<u>J.W.Hibbs</u> & others	5 est.
38. Studies on Pica in Camels - Some Aspects of Etiology, Haematology, Biochemistry & Therapeutics	1971	HAU Jour. of Res. <u>14:82</u>	<u>J.W.Hibbs</u> & others	7 est.
39. Dissipation of Parathion Residues from Cabbage (Brassica oleracea L. var. capitata L.)	1971	Indian Jour. of Agric. Science	<u>H.R.Krueger</u>	6
40. The Effects of Land Holdings Size on Agricultural Mechanization in India	1972	Paper at American Society of Agricultural Engineers	<u>Leland O. Drew</u> <u>Byron Bondurant</u>	8 est.