PORTUGAL TRIP REPORT

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I left Ames, Iowa on June 12 at 8:00 a.m. and caught a flight at Des Moines, Iowa 9:45 a.m. With an intermediate stop in Chicago, I arrived at Kennedy airport at 4:15 p.m. After transfer to TAP airline, I left New York at 7:30 and arrived June 13 in Lisbon. I was met at the plane by Dr. Antonio A. C. Pinheiro who gave me instructions from John Sanders and helped orient me to the program of the next three days. I accumulated all reports possible from Purdue University, Stanford University, the University of Arizona, the World Bank, the Procalfer program and the Ministry of Agriculture and Fisheries.

On June 14, accompanied by Dr. Sanders and Dr. Pinheiro, I had briefing sessions with Dr. Glenn Purnell and his staff on the Procalfer program and related economic problems of Portugese agriculture. Ready, Sanders and Pinheiro discussed the problems and programs further and I had a short visit with Marshall Martin of Purdue University.

On June 15, we met with the agricultural economists of the Gulbenkian Institute, again discussing the agricultural economic problems of Portugal and research of the institute which related especially to the Alentejo Region. In the afternoon, we met with Charles Buchanan and other AID personnel to review the general nature of programs and outlook.

On June 16, accompanied by John Sanders and Antonio Pinheiro and other staff members from the University of Evora, I gave a seminar at Estacao Agronomica National for scientists from this institute, the Gulbenkian Institute and other research institutes and organizations of Lisbon. Part of the day was devoted to obtaining a solution to a linear programming

problem of the Gulbenkian computer. We drove to Evora in the late afternoon and my wife and I checked in at John Sanders house until we could decide on a hotel.

June 17 was spent reviewing programs and facilities of the University of Evora, and meeting with the staffs from the department of economics and the department of management. I met with Eng. Manuel Rente and his division chiefs in the regional Ministry of Agriculture, Commerce and Fisheries, I presented an informal seminar on interrelationships among agricultural research, extension, agricultural market conditions and availability of resources and technology. I also had a meeting with Dr. Carlos Portas, head of the agronomy department and director of the agricultural experiment station of the University of Evora at Mitra in which we discussed his concepts of research projects and programs. I also met with the University Rector, Ario Lobo Azevada who I had met five years earlier when I was studying the problems of the "agricultural occupation" in the Alenejo and bordering regions. University enrollment had increased by a large amount from 1977 when the university had just been initiated. We also discussed university research and educational possibilities and flexibilities. Finally, I had a lengthy discussion with Dr. I. Abba Sharr, chief technical adviser for the Food and Agricultural Organization of the United Nations (FAO) in their Evora office. He and his staff work on the Alentejo Soil Conservation and Drainage Project. However, analysis of this project had brought him to see that more than a drainage problem is involved. He considers the solutions to fall in the realm of cropping systems and related livestock systems and management alternatives -- with eventual solution through farm management analysis. He would be

willing to try to catalyze some funds towards the agricultural economists of the University of Evora for conforming research analysis.

On June 18, with Antonio and Ermelinda Pinheiro, I spent the full day at INIA by Elvas, the regional agricultural research institute. I talked with all of the major scientists and technicians in forages, cereals, sun flowers and other commodities. I also reviewed all programs and facilities at the institute, inspected their field trials and reviewed their seed multiplication facilities.

On June 19, I spent the morning discussing the programs, classes and curricula of the department of economics and the department of management with Dr. Antonio Pinheiro. I spent the remainder of the day reading the materials I had accumulated since my arrival.

With John Sanders, Gabriela C. M. Silva Carvalho and Maria Helena, I spent the full day of June 21 on a field excursion in examining agriculture enroute to Beja and visiting university farms in that area. We spent a considerable amount of time at the farm Herdode da Almocreva reviewing accounting systems and records under construction and possible.

John Sanders and I visited farms of the Eugenio de Almeida Foundation in the morning, and examined concepts of farm organization and size, as well as data availability. Dr. Antonio Pinheiro and I discussed the department of economics and the department of management, both of which he serves as head, on a course-by-course and staff-member-by-staff member. We also discussed his own work load as head of two departments, a member of university committees, the director (almost major professor) of a staff of young people who, along with Antonio, teach the courses of the departments. We also discussed the

agricultural economics research orientation and teaching which he and John Sanders are developing in the departments. The two departments have heavy teaching responsibilities, one serving as a general economics department and one serving somewhat as a business administration department. However, courses in farm accounting, farm management, programming, general agricultural economics and policy are included in both departments. Since the University of Evora was organized only a half dozen years ago, it has grown rapidly in student numbers and accompanying problems of staffing, staff training, administrative procedures, committee assignments, financing, etc. It was initiated mainly as a teaching organization somewhat in the manner of independent "liberal arts colleges" in the United States. While a professor heads a department, the teaching staff, especially in the economics and management departments, is made up mainly of young persons. The department of economics includes nine full-time teachers and five part-time persons. The management department includes eight full time teachers and six part-time persons. Some of the part time persons come out from Lisbon to teach. Numerous of the staff were recruited from high school teaching ranks or parallel soon-after-graduation positions. Only one or two have had formal graduate training. The young staff so recruited, however, seems bright and ambitious. They carry heavy loads in simultaneously studying on their own some advanced economics and management materials, teaching undergraduate courses, giving examinations and correcting examinations. To an important extent, the department head must guide their reading in the manner of a major professor guiding a group of graduate students. (They are simply learning some advanced economics, even some economics, and quantitative methods for teaching and

knowledge purposes and are not pursuing a degree per se.) The administrative and decision procedures of the university are rather complex. Hence, the teaching responsibilities of the two departments, the in-house training program underway and a heavy and complex administrative load, Dr. Pinheiro is kept extremely busy and it is difficult to develop an agricultural economics research program as he and John Sanders are attempting.

However, they have aroused an exciting amount of interest of several of the young staff in research (in a university whose current thrust is mainly teaching and little scientific or research work) and in agricultural economics research in particular. They also have excited a number of these young staff members in learning about the economic problems of agriculture, in getting an on-the-grounds acquaintance with agriculture and in learning the quantitative methods for real-world tackling of these problems. They have accomplished an exciting beginning task in a setting where it would not normally be expected and where many professionals would become discouraged even in trying to do so. (I am certain that Antonio Pinheiro and John Sanders do have some discouraging moments.) However, they have given an agricultural economics research program a beginning which has direction and momentum. The personnel with whom they work are not assistant or associate professors who have finished a long M.Sc. and Ph.D. training program. Instead, they are mainly persons who have finished their first university degree (typically in a field other than economics), have a full-time assignment in teaching and must learn the major principles and quantitative techniques on a learn-as-you-go basis. Obviously, for a major agricultural economics program to be developed at the University of Evora and in the Alentejo region, more trained resources with

time specifically budgeted for research will be required. Also, support staff (programmers, clerical workers) and modern equipment (ranging from small computers to main frame computers) will be necessary. While they are hired to teach, nearly all of the full-time professional personnel in the department of economics and the department of management are doing some research. The research concentrates on agricultural economic problems. The staffs are paid for teaching and not for research. The courses in the economics department include: two courses in the principles of economics, two courses in micro economics, two courses in macro economics, public finance, operations research, public policy, regional economics, econometrics, agricultural economics, two courses in public economics, history of economic thought, project evaluation, foreign relations, international economics and industrial economics. The courses taught in the management department include: accounting, financial management, cost accounting, general management, personnel administration, marketing, auditing, law, farm accounting, financial mathematics, capitalization, management and production and two courses in farm planning (which also include some linear programming analysis). Graduates in the economics and management departments must compete with older established universities and more mature faculties in Lisbon and Coimbra for placing graduating students. As well as developing their own graduates, the departments of economics and management also service other departments in general courses.

The University of Evora does have a small agricultural faculty at Mitra, several miles distant from the city of Evora. This Faculty of Agronomy includes several of the fields typically studied in U.S. and European agricultural colleges -- including some aspects of horticulture, field crops, agricultural engineering, soil drainage, viniculture and animal science

(including forage production, rotations and grazing rates). Students travel back and forth from Evora University and Mitra by bus. Each field of study is headed by a professor who is aided by assistants who teach undergraduate courses and help with or conduct research. (The rector of the university, aided by an assistant, conducts some research on crop rotations.) More time and equipment for research is available in the Agronomy Faculty at Mitra, although resources for these purposes are still meager compared to a major agricultural faculty in Europe or North America. However, the Agronomy faculty has made a beginning in research and it has established some precedents. In terms of the regional problems of the Alentejo and the major comparative advantage of the region in the nation's economy, the Agronomy Faculty needs very great extension and expansion, especially in research activities, trained personnel and some equipment. It has a relatively good library for undergraduate majors but these facilities needed extension for an enlarged research program. There are numerous gaps in fields of agricultural research and many more people with graduate degrees are needed for a major agricultural research emphasis. The library at Mitra is lacking in agricultural economics literature and the library in Evora at the university is only meagerly supplied with agricultural economics literature. Several courses typically taught in agricultural facilities (e.g., soil fertility, soil classification, certain plant fields, etc.) are taught instead in the general departments (physics, chemistry, geology, etc.) at Evora.

The program in agricultural research at Mitra provides an initial base and some direction for an expanded research program. It thus includes the

opportunity and need for addition of an agricultural economic research and specialization component -- a point to which I will return later. Under the Purdue-AID program, a number of personnel at both Mitra and in the agricultural economics department have been able to make study tours abroad. These tours have been very helpful and inspirational to the persons who have participated.

On June 23 and 24, I met individually with the staff members from the department of economics and the department of management, headed by Dr. Antonio Pinheiro. My conversations with them covered their training, previous experience, work assignments, personal and professional goals, general activities and related items. I found them enthused by the department leadership given them but rather concerned about their future degree requirements. Portugal has passed legislation requiring that university teachers acquire M.Sc. and Ph.D. degrees by stated intervals in the future. Hence, staff members are concerned about grants and scholarships to go to other countries for degrees, the complexities of working on a degree in Lisbon while continuing to teach at the University of Evora, the problems of handling their families (especially female staff members) while they are absent at graduate schools, the fields of specialization, etc. They generally were an inspired and interesting group of young people. I was somewhat amazed that a group with such a highly concentrated professional interest could be recruited from various fields and transformed into young inspired persons. I helped advise them on future specializations, schools and research work. For those giving papers at the upcoming two-day seminar organized by Antonio Pinheiro and John Sanders, I tried to help them in ways

possible and encourage them in their presentations. I learned about the subject matter in the courses taught by each individual, including those of the economics and the management departments. Several of the courses were in agricultural economics and quantitative methods -- as well as micro and macro theory and the general courses of economics and operations research, business management, accounting and other general courses of a management department, course list no.

Antonio Pinheiro has done an excellent recruiting job of young people with a budget and personnel restraint which limits him mainly to B.Sc. (equivalent) teachers with he being the only advanced degree. He has been extremely successful in inspiring them. He and John Sanders are to be complimented in the extent that they have interested these "general economists" in agricultural economic problems of the region, the extent that they have been able to get staff members acquainted with the "real world" of agriculture, the engagement of them in anticipation in research in agricultural economics and the forward look and potentials they have outlined for agricultural economics courses and research for the Alentejo region.

On June 25, I gave a seminar to the Agronomy Faculty at Mitra and carried forward discussions with them on the general topic "Suggestions for Agro-Economic Research and Extension in the Alentejo." I also visited with various members of the faculty about their teaching and research. In the afternoon, I spent some more time with staff members of the economics and management departments on their papers for the upcoming two-day seminar. I also began reading more of the materials I had accumulated.

On June 25, I met with two staff members on their research problems and spent the remainder of the day reading economic and agricultural reports on Portugal and the Alentejo.

(Over the period June 27-July 4, I took leave from the project and journeyed to Vienna, Austria where I served as U.S. team leader in developing a model of sustainable agricultural production for the International Institute of Applied Systems Analysis).

On Monday July 5, John Sanders, Victor Dordio and I left at 8:30 a.m. and returned at 7:30 p.m. for visits to a cooperative winery, grape fields and university farms near Beja. We also viewed and discussed some of the complex soil and climatic variations of the Alentejo region, farming systems used (including seemingly inefficient fallows for pasture), the bio-physical and economic research problems posed and related problems.

I met with the faculty of the Agronomy Department at Mitra on July 6 discussing their teaching and research programs. The department is made up of a professor and several assistants who do mainly teaching but also do some research. The assistants are in various stages of completing master's degrees and one is ready to go to the U.S. to work on a Ph.D. degree. We reviewed and inspected the research underway -- including grazing experiments and work on grapes. The remainder of July 6 and 7 was spent preparing for the two-day seminar Dr. Antonio Pinheiro and Dr. John Sanders had organized at Mitra on the agricultural and economic research problems for the development of the Alentejo region.

July 8 and 9 was spent at the excellent two-day seminar organized at the University of Evora and held at Mitra where it would be handy for the

faculty of Agronomy to attend. In my opinion, the seminar was highly successful. It examined research needs in the Alentejo for development and effectively introduced to the agriculture and associated world a "budding" agricultural economics research program. The young staff members in the economics department and management departments which John Sanders and Antonio Pinheiro had encouraged to initiate research projects reported their results to the seminar participants. This indeed was an innovation at a university which does not have an agricultural economics department, has only young staff members assigned mainly to full-time teaching of general economics and management courses and does not have any resources set aside specifically for research in agricultural economics. The seminar gave the young staff an opportunity to gain experience and attain confidence in their abilities at quantitative analysis for the Alentejo reason. It was also a "first" in bringing economists and physicists and biological sciences together so that they could judge analyze and better understand the interaction of their ongoing and needed work in the Alentejo. It brought a better understanding of the role and potential of agricultural economists in research and problem solving activities. With a number of the university administration attending, it also implied to them the need for a vigorous agricultural economics research program to tackle economic problems forthright and to interface economics research with that physical and biological sciences in agriculture. The interdisciplinary discussions began to suggest priorities in the research needs of the Alentejo. These discussions should be carried further. A number of persons from Lisbon, representing national research institutes and other organizations (including

Glenn Purnell of AID), were present. The discussions indicated that the Lisbon research institutes are not conducting sufficient economic and related research on the agriculture of the Alentejo. This void needs to be filled. Further, agricultural research is generally insufficient on the complex problems of the region relating to problem soils, weather variability, production variability and uncertainty, historical and potential crop systems, adapted varieties, farm organization and systems, interplanting, farm size, existing economics of institutional complexities, farm credit and capital, improved livestock, animal nutrition and grazing systems, soil drainage, comparative advantage in entering the EC, labor underemployment, confused farm structures and others. The attendance at the seminar of some local leaders (university rector and vice rector, director of an agricultural foundation, director of the Ministry of Agricultural, Commerce and Fisheries services in the region, etc.) also helped to bring focus on regional problems and educational and research needs. It was useful to have these persons appear on the program, Antonio Pinheiro and John Sanders gave a paper on research priorities in the region and I gave a paper on "Land Tenure, Incentives, Institutional Change and Agricultural Growth -- Income Objectives in the Alentejo." (I had previously made an analysis in the region for the Ministry of Agriculture and Fisheries relating to economic strategies relative to the collective farms, cooperative farms, family farm reserves, small farms, etc. upon the occupation of farms by workers in 1977.)

On July 10, I wrote up my notes to date, visited with some young staff members of the economics department on their research problems and began writing a report on my assignment.

On July 12, John Sanders, Victor Dordio, Maria Helena and I toured other university farms and agriculture of the Alentejo. We found an excellent set of records which gives a long time series of technical coefficients by farm and enterprise. These farms and others owned by the University of Evora provide numerous opportunities in research, education and income not now being exploited. Perhaps laws and institutions will have to be changed to allow utilizing these opportunities. I comment on both the possibilities and the changes need to realize them at a later place in this report. The gift of these farms to the University by a present University of Evora professor was fortunate, both in carefully and scientifically kept records he had executed in setting standards of management record keeping, data set establishment and other aspects of agriculture. We also inventoried and evaluated many economic and technical problems of agriculture on this field trip.

On July 13, I gave a four-hour seminar for the Agricultural Extension administrators and specialists of the Alentejo region. It was an excellent exchange in which we both gained. I emphasized the total framework in which extension must function interdependently to best foster technological change, improved agricultural production and development, i.e., the interrelationships among research to generate information, extension education to communicate it, a favorable price and market environment and policy to economically facilitate it, the physical availability and timliness of work and services and institutional framework to provide innovative incentives -- along with any necessary exogenous policies on stability, etc. In the late afternoon, I again visited with staff members of the

economics department and the management department on their programs and possibilities. I began further conversations with university administrators on these and related dimensions of university programs.

July 14 and 15, I visited cooperative, collective and related farms in the Alentejo region with John Sanders, Antonio Pinheiro and Ministry personnel. With mammoth structural and institutional changes over the last several years (including worker occupation of farms, creation of cooperative farms and units of collective production -- UCP's -- the use of large farms to increase size of small farms, the recreation of modest-sized private farms from the "reserves" withdrawn for owners from the cooperative and collective farms created as a public sector component, and with further transitions and uncertainties in structure posed for the next decade), the problem complex is urgent for the Alentejo Region. It promises to retard the growth and productivity of agriculture. It stands to keep incomes lower than otherwise possible. It provides a farm structure foreign to current analyses of EC entry. It provides a setting in which extension education becomes semi-political and difficult and it even has important impacts on agricultural research needs of the region. The problem cannot be "blinked away." It exists as a major problem of economic, sociological and administration research. We covered a wide range of conditions and uncovered many sources of record and data useful for detailed micro and macro economic analysis of the region. These are major research and knowledge problems of the decade ahead. Much of importance in Portugal depends on this analysis.

In the afternoon of July 15, I seminared with the four-person section of extension education which is administratively linked with the sociological department but is largely an independent activity and interacts closely with personnel of the economics department and the Faculty of Agronomy. One person has recently spent a study tour in the U.S., one is about ready to go for four months and one is setting out to work on a M.S. in the U.S. This group is concerned primarily with the educational philosophy, the appropriate educational methods and communication means for information dissemination over many subject matter fields. Extension is a difficult activity in Portugal because of (a) lack of historic precedence, (b) limited research information, (c) historically a highly government and centralized activity from Lisbon, (d) an intermixture of extension and governmental socio-economic politics, and (e) other complicating conditions. With the paucity of attempts elsewhere in Portugal, it is fortunate that this somewhat "lone" extension education and methodology group exists at the University of Evora. They are doing, in addition to their other heavy duties, useful activities in researching and posing inquiries of the "whys and wherefors" of agricultural extension in Portugal. I explained several of the significant changes and directions taking place in U.S. agricultural extension education. The group had gained greatly by a two-man workshop in extension which Purdue University had arranged for them and from a German workshop on extension held at Hohenheim, Germany. This educational and analysis unit can become extremely important in the development of extension and the advancement of agriculture in the Alentejo as members of the group return with more education and experience.

In addition to discussions with several young staff members on their research problems and methodology, I had final discussions with Rector Professor Ario Lobo Azevedo and Vice Rectors Professor Cruz de Calvalho and Professor Santos Junior. We discussed philosophy of education, science and research for the University of Evora in the future, research problems and needs in the Alentejo region, problems of research financing, data needs for modeling and analysis of agricultural, land use, drainage, ecological and farm and regional problems of the Alentejo. A general sentiment of goals prevails for developing the University of Evora into a "full university" which would incorporate a research component to support the teaching component and provide leadership in solving regional problems. While financing must be obtained, there may be several sources including university farms (under certain institutional changes).

On July 16, I discussed problems and methods of developing an agricultural economics department at the University of Evora with Antonio Pinheiro. We also discussed a potential research program in agricultural economics in terms of problem urgency and payoffs to the Alentejo region and Portugal. We also met with Don Paarlberg, John Sanders and some private farmers.

On July 17 and 18, I worked on research priorities and wrote on my project report. On July 19, I met with Professor Mariano Feio on farm records and accounts. I spent the remainder of the work day counseling with members of the economics department and management department on their research methods, courses and potential graduate work. In general, this is an enthusiastic group which has now gotten interested in research. Except for one, all staff members in the economics department and the management

department must complete M.S. and Ph.D. (or their equivalent) degrees to remain as university teachers in the future.

On July 19 evening, I went to Lisbon with John Sanders and spent the next three days there in programs arranged with the Ministry of Agriculture, U.S.-A.I.D. and the U.S. agricultural attache's office. During July 20-22, I had planning sessions or seminars at the invitation of Dr. Carlos Fontes (Director General of Livestock in the Ministry of Agriculture, Commerce and Fisheries), Eng. Jose Varela (Director of the Planning Cabinet and Accession to the EEC of MACP), Dr. Carvalho Cordoso (Secretary of State, MACP) and U.S. A.I.D. and Embassy Personnel. I also spent a considerable amount of time in discussion with the PROCALFER Transportation Team and the EEC Accession Team who are engaged in economic research on these two areas. I left Portugal at 3:30 p.m. on July 22 and continued to work on my trip report enroute home. I returned home at 1:00 a.m. on July 23.

Recommendations

My recommendations deal mainly with agricultural economics research in particular with some mention of the teaching necessary to attain the relevant goals. However, goals in agricultural economics research and training cannot be attained apart from the goals and research programs for agriculture generally at the University of Evora. Further, the goals for agricultural economics research, and agricultural research in total at Evora, cannot be attained apart from the general research, educational and directional goals and basic philosophy for the whole of the University of Evora. It is highly unlikely that an outstanding program in agricultural economics research and

training would emerge at Evora in the absence of a major research and scientific program for the university as a whole. A high standing general research program for agriculture in the Alentejo is unlikely unless the University of Evora also promotes and attains a systematic and high level of scientific research generally. However, the development of research and graduate programs in agricultural economics and in agriculture generally (beyond the relatively small scale the latter has attained at the present) can serve as a leader for the rest of the university. This sequence is somewhat natural since the main resources of the Alentejo are those of agriculture and rural people. There is high need for research on specific resources, specific commodities, farm organization and resource allocation, regional resource use and allocation, rural community development and regional resource use and allocation generally. A wide range of economic problems relates to land utilization in the region, the profitability of fertilizer response, credit and capital investment under the tenure and agroclimatic conditions of the Alentejo, farm and enterprise and scale economies as they relate to farming and resource returns to medium sized farms, small farms and cooperatives, management abilities, underemployment and the skewed age distribution of the agricultural work force, irrigation potentials, lags in technological advance, subsidy and price policy effects, grazing strategies and other. Some research areas will be complicated by national policies and eventual entry of Portugal into the EC.

Development of agricultural economics

Because of the somewhat regional orientation of the University of Evora, important early dimensions that the university should add are

(a) research and major teaching in agricultural economics, and (b) a greatly extended agricultural research program, with resources focused especially on the high priority problems of the Alentejo region. The fact that the university does not now have these programs is not a criticism. The university is only a half dozen years old. It had the immediate charge of developing an undergraduate teaching program with extremely limited resources and meagerly trained personnel for the bulk of its teaching staff. It has had extremely rapid growth in the undergraduate and teaching programs. In cases of many departments, such as the department of economics and the department of management, it has been necessary to recruit high school teachers or those of parallel educational levels to carry the main teaching load. As stated before, these persons are not paid to do research, they are busy learning the subject matter they are to teach and in giving and correcting examinations. There is no formally or informally recognized agricultural economics department as in the conventional U.S. land grant university and one would be amiss in criticizing this new university for this status. The economics department is of the general type ordinarily located in the college of sciences in a U.S. university. The department of management is more akin to a department in the college of business administration in a U.S. university.

The head of these two departments, Dr. Antonio A. C. Pinheiro, is one of only three persons in Portugal trained to the Ph.D. level in agricultural economics. He is an extremely able agricultural economist, general economist and quantitative analyst. He has done an excellent job in teaching and directing the economics department and the management depart-

ment under the conditions of staff training, curricula and general occupational goals and opportunities of the University of Evora graduates. He carries a heavy teaching and administrative load in guiding the young teaching staff in these two departments. He also carries a heavy extracurricular load of administrative tasks. Beyond these duties, any research "squeezed in" must be an extracurricular, after-hours activity.

As mentioned previously, Antonio Pinheiro and John Sanders have accomplished an exceptional task in taking some young persons from the department of economics and department of management -- entirely outside the Faculty of Agronomy (i.e., the college of agriculture in a U.S. land grant university) and (a) exciting an interest in agricultural economics problems by a young staff not trained in this field (and often not even in economics), (b) getting them to study and apply the quantitative methodologies appropriate for the problems, (c) carrying their interest to a level where they were able to conduct field work in obtaining necessary coefficients and data, (d) in presenting their findings in communication to others, and (e) developing a continued interest in agricultural economics research and applying to U.S., Portugal and other graduate schools to work on graduate degrees in agricultural economics. Hence, an initial momentum has been attained. This momentum could erode or disappear upon the departure of John Sanders and Antonio Pinheiro. Of course, the challenge to the University of Evora and Portugal is to prevent any waning of interest and dilution of personnel so that the program now in a small beginning can progress positively. John Sanders will eventually depart for Purdue University to develop his program there. It would be a set-back in the potentials of an agricultural economics program if Antonio Pinheiro were to migrate to positions where he

has greater opportunities in research and agricultural economics.

Portugal and the University of Evora, could best use his talents in developing a vigorous agricultural economics programs. This is an important need of the region. Other agricultural economists and scientists would support this direction and some indication of start-up funds prevails. Such a specialization would complement the development of other strong research programs in agricultural sciences at the University of Evora.

The department of economics and the department of management do not have comparative advantage at the University of Evora (although this is not the reason why they should not be pursued in a new university such as that at Evora). The comparative advantage of departments of general economics and business administration (i.e., management) will continue to reside at the University of Lisbon and the University of Coimbra, unless the University of Evora has a vast infusion of senior staff members and can build up the following that the former universities have attained over a long period of time in larger urban and industrial centers. The comparative advantage in economics at Evora can likely be developed to the highest level in agriculture where it resides in the major agricultural region of the nation.

An agricultural economics specialization and department might be developed in several configurations. One would be a purely teaching function in the Faculty of Agronomy. But there would be no advantage to this because it would result only in undergraduate courses without a research component. This function (undergraduate teaching of agricultural economics) is already attained to an important degree in the departments of economics and management and it would relinquish the young teachers who

might become interested in agricultural economics research. A second and greatly better alternative would be to establish a teaching and research component of agricultural economics under (in attachment with) the Faculty of Agronomy so that it can better interact with related disciplines such as animal science and agronomy and retain its general university function in teaching general economics and management. There are two subalternatives under this second major alternative: (a) In the first, agricultural economics teaching and research would continue in conjunction with the teaching of upper level economic theory (micro economics and macro economics) and quantitative methods (econometrics, operations, research, etc.) in the same department. This could help assure that the level of teaching in economic theory and quantitative methods would be at a level which would assure high training and research ability of undergraduate and graduate students in agricultural economics (and economics and management if graduate training were ever initiated in this area). Under this subalternative, the lower level and other undergraduate courses in the economics and management departments could be separated into two separate entities, each with an administrative head, as they are generally found in colleges of sciences and business administration respectively (or they could be combined into a single department in this context). This "higher level department" of agricultural economics (including upper level theory and quantitative methods) would need addition of appropriate assistants for undergraduate teaching and addition of other persons with graduate degrees who could teach graduate level courses, guide graduate students, conduct significant agricultural economics research and become known scientists. (b) The second subalter-

native, less preferred than the first, would leave the newly developed, expanded and upgraded agricultural economics component in full association with the economics and management departments as it now is -- all as one administrative unit. This would require assistants in the Faculty of Agronomy components for teaching and research. It would require graduate degree professors in the agricultural economics component to conduct research in this discipline. It would allow the young assistants in economics and management to do research as graduate work in agricultural economics. It would require more persons with graduate degrees in economics and management -- to alleviate the present situation of bright but relatively untrained (i.e., without formal graduate work) persons learning as they teach. It would require large adjustments in the administrative load of the head professor so that he would have time for research, writing and keeping abreast of his discipline.

Alternative 2a, supplemented with the appropriate assistants to teach and research, additional graduate degree personnel for research and teaching and maintenance of some high level micro, macro theory and quantitative courses seems preferable for developing a strong agricultural economics program at the University of Evora. If it is to be developed, steps in this direction should be taken immediately. Otherwise, the small but important beginning now in place will erode away. Under the current structure of solely undergraduate programs and the main fields of education at the University of Evora, the institution cannot long hold well-trained, capable young professors who have the talent and ability to do quality research and advanced science, with a lifetime ahead of them to do it.

Another element of university training and graduate education must be mentioned as it is likely to impact on the University of Evora. The nation now has laws requiring that university teachers now acquire the equivalent of M.Sc. and Ph.D. degrees by specified future times. Under these mandates, bright B.Sc., Eng. degrees to teach undergraduate courses are less likely to be available to the University of Evora if it does not have a graduate program. Instead they will go to Lisbon or abroad where they can attain teaching or research assistantships while they pursue advanced degrees. Few persons will be able to successfully teach undergraduate courses full time in Evora, do part-time graduate work in Lisbon and either persist or complete their degrees in legally specified times. This condition could give rise to a set of transient undergraduate teachers at institutions such as the University of Evora; they may attract high school teachers or newly-attained first-degree students who stay the legal limit without advanced degrees, then move on to other occupational activities. This is a serious problem which will face universities and technical schools such as Evora. Further, the new technical schools or training institutes will further compete for this personnel (and even students) from the University of Evora and similar institutions.

In the initial establishment of an advanced agricultural program at the University of Evora, use could be made on a part-time basis of advanced degree personnel from Lisbon institutions. An example would be those from the Gulbenkian Institute, the Estacao Agronomica National and others. Some of these institutions have already expressed a desire to cooperate or participate with the University of Evora if it initiates a high level quantitative program in agricultural economics. Of course, continued

presence of trained foreign participants would be extremely beneficial for some time in the future.

Financing agricultural economics research

An agriculture economics research program will need financial resources, as will other fields of research at the University of Evora. The Eugenio de Almeida Foundation could be one source for farm management research. The three university-owned farms can serve as another source. As soon as the legal complexities of resource and asset ownership on these farms can be resolved part of the earnings of these farms can be used for farm economics research. (Effort should be devoted towards a quick revolvement, otherwise they will remain in a state of frustrated operation without contribution to any major goals.) These farms provide an opportunity for three important missions for the university: (a) demonstration of scientific farming and advanced farm management systems, (b) on-farm research on soil, crops, grazing, forages, livestock and related problems, and (c) a source of funds for other research. For the latter purposes, they need to be maintained in an advanced stage of farm management so that the commercial activities of the farms will generate as much profit as possible (in consistency with resource preservation and long-run sustainability of agricultural production). These goals can be attained only when ownership and legal complexities of the farms are completely settled and the university entities maintain an orderly, scientific and complete set of records subject to conventional accountancy procedures and economic analysis. Even self-protection of university administrators calls for these records.

Eng. Augusto Jose de Oliveira of the INIA Estacao Agronomica Nacional has expressed an interest in doing research and training graduate students with Dr. Antonio Pinheiro where quantitative abilities would be strong. I. Abbar Sharr of the Evora FAO office has also suggested some possible funding to determine the economics of farming and cropping systems which relate ultimately to soil drainage and erosion. Other possibilities of this nature may exist.

Other private sources of research funds for agricultural economics can be sought. However, an important part of additional research resource in agricultural economics research will have to come from a greatly expanded research program for agriculture generally. Portugal agriculture has suffered from an underinvestment in research as compared to other European, North American and even some less developed countries. While it has had far too few funds invested in agricultural research (and agricultural extension education) in the past, its relative investment in agricultural economic research has been even more and too meager. Portugal agriculture is characterized by vast social and economic problems in every region. However, this is especially true of agriculture and rural communities in the Alentejo which is a major resource and agricultural region of the nation. All relevant agricultural research resources must be increased, but research in agricultural economics and related problems especially need greatly enlarged funding. The economic problems of the Alentejo range widely from cropping systems and organization of individual farms, economic strategies of meeting the risks associated with highly variable climatic conditions, the economics of enterprise and farm size and the resolution of tenure and

structure problems, the complexities (legal, climatic and market uncertainties) which restrain capital investment and improved productivity of agriculture, the potential cost/benefit payoffs of different land-water management schemes, interrelated farm and rural community development in the region, rural employment and human capital, aggregate regional agricultural development possibilities, the impact of national (subsidies, price policy) and international (cessation of food aid, entrance into the common market, etc.) and a vast range of others. Most of these problems are urgent and suggest a quick and orderly organization of a well-focused agricultural economics research program.

Agricultural research generally and decentralization

More regional research programs are needed. While the INIA research institute at Elvas is performing an important set of research and crop improvement activities, there also is a need for a well sustained agricultural research program at the University of Evora and a wider dispersion of research over the region on the special problems of the soils, climate, drainage, farming systems (including rotations, interrelated cropping and livestock systems, interplanting) and other outstanding problems. Research plots are needed at a number of locations of the region to meet the variations in agroclimatic conditions.

While the INIA and similar research stations do exist, not only is the total investment in agricultural research too small, it also is too centralized. With a concentration of agricultural research around Lisbon, too little is accomplished for the regions. With a greater investment in

research an opportunity will exist for a greater dispersion of it among problem areas of the country and regions. The University of Evora, as a public or government institution with the responsibility and need for developing a joint research-educational program, can be an important instrument in dispersing research on cropping systems, risk strategies, fallow and grazing strategies, adapted livestock systems, crop varieties and mixer, dryland and irrigation systems and other problems of agricultural production and resource uses.

Both an expanded agricultural research and agricultural economic research program is needed. There are many unresolved natural and economic problems in the region. The number of unresolved problems is astonishing -- given the many decades over which agricultural research has been conducted over the world. For example, in my several visits to the Alentejo region, I have not been able to find a specific answer to the role or extent of fallow in the crop rotation or cropping system. Some ~~each~~ have explained it as a function of the management of nitrogen, water, soil structure, etc., but without quantitative indications of the incremental gains in crop yields from fallow per se or various years of it in a crop rotation. The crop rotation and the number of years of fallow is, of course, highly related to the optimal livestock and grazing system -- as is the mix of plants grown on the fallow land. Currently, fallow land is dominantly used to produce a set of low yielding volunteer (self seeded) annual grasses and miscellaneous plants. I found no specific information on the potentials of other cropping systems including fertility management and drainage alternatives in comparison to the present fallow systems. I found

no specific information on alternative and higher yielding annual grasses, as compared to the self-seeded low yielding annuals (although progress is being made in experiments on annual clovers in relation to cropping and tillage systems, stocking rates and livestock production methods). However, much of the research adapted to other locations of southern Europe (where agricultural research investment also has been light) does not adapt readily to the site-specific and peculiar agro-climatic (including soil types, land configurations, ecological conditions, etc.) of the Alentejo. Research in both agriculture and agricultural economics is needed since the two are complementary in solving the problems of the region. Further, a high quality agricultural economics program is not likely to function well without a similarly competent general agricultural research program in all of the relevant disciplines. Some of the data needed for economic analysis of agriculture must come from the biophysical fields of agriculture. And it is important that these two areas of research be conducted in tandem. For example, economic use of much physical data depends on the forms of the latter. The form will depend on the experimental analysis and statistical estimation methods used. To insure these forms for application under alternative economic conditions, the economist and biophysical scientist need to work together from the outset of the research project and experiment. Further, the useful input of the economist with the biophysical scientist is often at the outset of the project, rather than just in interpreting the data. But aside from these specific needs, and while there are exceptions, an outstanding program in agricultural economic science is not likely to prevail except in the presence of an important agricultural science program in general.

Science and education at the University of Evora

Portugal needs an integrated educational and research program in its most important commercial agricultural region. The University of Evora presents this opportunity. However, it will be the overall ability and philosophy of research at the University of Evora which guarantees a successful research program in crop, animal, soil, horticultural, engineering, economic and other phases of agricultural research. A high level integrated research and education program could prevail in the Alentejo in the absence of a university highly dedicated to research, but it is highly unlikely that this could occur. Hence, the level of agricultural research, including agricultural economics, is likely to prevail in the future only if the University of Evora becomes a research-oriented as well as a teaching-oriented university.

The university has been highly successful in developing largely an undergraduate teaching institution, with some research facets, in a short period of time. In only slightly more than a half dozen years, it has increased its undergraduate enrollment at an extremely rapid rate. It has done so successfully under the restraints of funds, buildings and equipment facilities, a highly trained teaching staff and a tradition as a university. Its undergraduate enrollment will grow further in the future, under many of these same restraints, to perhaps five times the present enrollment!

But what Portugal and the University of Evora must decide is whether at the end of 20 years, the university will be a high level and integrated teaching and scientific institution, or whether it will develop mainly into

a "talking book" or undergraduate teaching institution. I use "talking book" to characterize those colleges or universities which do not generate new knowledge or research results but are staffed mainly by personnel who teach undergraduates from material which they learned in their own university studies or which they have read since. The staff of the "talking book" university often is not highly trained and must learn from books what it teaches students. There are many such institutions in the United States and elsewhere. I do not look upon the University of Evora as a "talking book" institution at the present time, but I just want to be sure that it does not become one in the long run.

To steer another course in the years ahead as it acquires more undergraduate students, the university will have to add more staff members trained to higher levels. It also will have to allocate a portion of research - able staff members to research activities if they are to be attracted to and held on the staff of the university. Investment in equipment to serve their research also is posed. Hence, if a full university in the sense of relevance in both student education and research is attained, funds and resources will need to be made available accordingly.

To an extent, the future may be self correcting. Current statutes require that college teachers acquire an M.Sc. degree by a specified time and a Ph.D. degree (or their equivalent). Hence, eventually universities such as Evora will become staffed by persons with higher degrees. Equipped with this knowledge, more of the staff thus will insist on research time. With the legislation for degrees now on the books, the Portugese and public must be prepared for this day, the greater knowledge which will be acquired

and the resources required to fund it. This knowledge and research is the great hope for a nation whose main resource is people, supplemented by a limited amount of favorable natural resources.

An invigorated agricultural economics research and agricultural research program generally can begin immediately and need not await this longer-run development of a broad scientific research program at the University of Evora. However, the former two areas of research, geared especially to the resources and conditions of the Alentejo, will flourish best under this long-run development of the University of Evora.

As the university grows in these dimensions, and even now perhaps, it will need to modify its administrative structure to lift some of the administrative load from its most highly trained professors and scientists who have the ability and inclination to do research. Otherwise the university cannot hold this personnel. An overall administrative structure needs to be created wherein administrative decisions can be made and implemented in a ready manner to rapidly expedite programs while professors are freed for scientific activity. These procedures will require a somewhat larger administrative overhead and a realistic degree of autonomy in the hands of administrators selected or elected to guide programs. Some more administrative aid undoubtedly will be needed even at the level of departments so that professors will have a clear understanding of their professional priorities and more time freed for research.

Major regional problems

The University of Evora can serve importantly as a major regional university for Portugese economic development. Of course, it already is a national university in the distribution of students, but the unique contributions apart from Lisbon-based institutions is its potential in solving the economic growth problem of the major region in which it resides. Agriculture is the major economic sector of the region while land and human resources provide the major economic base. Aside from its teaching functions, the University of Evora can make its unique contribution to the Portugese society by promoting the development and improved use of these natural and human resources. The Alentejo is the major agricultural region of Portugal, a nation that increasingly must import the food which it consumes. It is my belief, and that of other persons, that the Lisbon-based institutions (aside from the excellent crop research station at Elvas) are not doing sufficient or significant research on the agricultural, natural resource and human resource problems of the Alentejo, the major farming region of the nation. If the University of Evora is to have a unique regional contribution, then it will best emphasize agricultural development and the solution of land and human resource problems in the Alentejo. There are many problems in the development of the region, including both general rural community development and improved farming. The university would need to greatly upgrade its programs in agriculture to make a significant contribution to the technical, economic and social problems of the Alentejo.

Some problems of the region are particularly outstanding and will need to be solved in the next 10 years if Portugal's development is to take place at rates possible and it is to make a successful entry into the EC. One particularly important problem set is that of the structure and tenure of farms and the great uncertainty for the future created by them. This uncertainty both restrains the capital available to farms and the willingness of farmers to invest in technical improvements. The rate of development of agriculture in the Alentejo will remain muted as long as these structure-tenure, capital restraints and uncertainties remain. A second urgent set of problems is that of the structure of Portugese agricultural policies and the distortions and disincentives which they generate. A third major and related set is that of EC accession. While the latter two problem sets are being analyzed at the national level, their impacts specifically on the Alentejo is needed. The farm programming models being developed can be used partly for this purpose -- perhaps later followed by a regional model relating to potential supply response and resource use. An important problem set with which the University of Evora should concern itself is rural area (or rural community) economic development. Further mechanization of agriculture will reduce further the farm work force. Alternative employment opportunities are needed both for this reason and to provide increased job opportunities in the region.

A very important set of problems still to be resolved is that of cropping (rotation) systems and the meshing of livestock systems (i.e., the optimum farming systems for the various agroclimatic areas of the region). The fallow with low yielding annual grasses and weeds used

for pasture and incorporated into rotations, although a long-standing farming practice in the region, appears to be an unproductive and perhaps unprofitable use of land. Various reasons are given by different persons for use of the practice: (a) to improve soil drainage, (b) to help conserve the soil, (c) to improve soil structure, and (d) to increase soil fertility. However, data generally are lacking on the incremental or marginal yield gains (throughout the rotation or for a particular crop year) to be realized for any one or all of these potential sources of soil improvement and yield gains. A large amount of interdisciplinary research is needed to predict or establish any yield gains, from fallow, to determine the possibilities of substituting other technologies for fallow, to finally determine the optimal crop rotations, conforming livestock systems and practices (in other words, the best farm organization including the optimum mix and techniques of interplanted forage crops). Economists should be involved at the outset of this research and later can devise partial budgeting and mathematical programming models to establish optimum farm organizations. Crop and livestock response functions (production functions) also are needed to determine fertilizer and water response and to best determine optimum feed mixes from the collection of grains, forages and crop residues produced in the region. Again, interdisciplinary research is posed.

The nature and variability of climate give rise to problems of decisions under risk and uncertainty which are rather serious. Farmers need to be helped in devising decision strategies to meet these risks.

The mix of farm and enterprise size gives rise to questions of scale or cost economies. With sufficient agricultural economic research resources,

it would be well to measure the range of sizes over which there are significant cost or scale economies. This information is needed for a improved farmer decisions and a more logical approach to farm structure and agrarian reform.

If the University of Evora is to become important in guiding the development of agriculture in the Alentejo, its staff needs to become better acquainted with the agriculture around it. This knowledge should include not only the extent and reasons for the technologies used on farms but also records or accounts (ranging from enterprise records to complete farm accounts) for a sufficient sample of farms. The current efforts in the department of economics to teach farm accounting and establish a functional set of farm records is a positive step in this direction that should be highly supported by the university administration.

Other micro and macro problems and approaches for the region could be mentioned. However, John Sanders and Antonio Pinheiro are generally aware of these and we discussed them frequently. Again, they are to be complimented for starting a group of young persons assigned to full-time teaching of positions in a general economics department and generate their interest in field work on and project implementation in agricultural economics research.

The University of Evora is not likely, however, to have a sizeable research program in agricultural economics until it has more persons with advanced graduate training and positions which allocate some of staff members time to research. Unless the university provides some research opportunities in agricultural economics, it is not likely to be able to keep capable people for any great length of time. Also, it then will be

unable to fulfill its possibilities in economic development of the Alentejo region.

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