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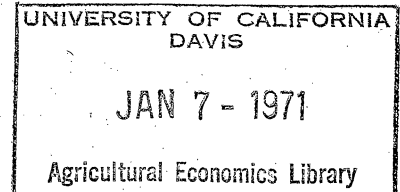
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1970

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AGRICULTURAL DEVELOPMENT EFFORT ASSESSMENT:  
THE COLOMBIAN CASE

By

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After almost two decades of intensive university involvement in foreign economic development efforts, assessments are certainly in order. Hopefully, such assessments can lead to enlightened university policies with respect to future involvement in such activities. Yet international technical assistance must be looked on as a long-term social investment, the benefits of which would be expected to emerge over future decades or centuries. Thus it is clear that in many cases assessments made at this time cannot adequately measure developmental progress attributable to assistance programs. Rather, current evaluations must be in terms of the expected contribution or progress to be realized at some time in the future.

Colombia, South America is one of the select countries around the world which has been singled out for intensive developmental inputs on the part of public agencies and institutions, private enterprise and the Foundations. Among the external agencies currently involved in the Colombian development effort are FAO, the Mid-American State University Association (MASUA) administered by Nebraska, an International Tropical Research Institute, the Harvard Development Advisory Service, numerous North American Universities working

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Prepared for the Southern Agricultural Economic Association Meetings, Memphis, February 2-4, 1970. Leonard Miller, Dean Schreiner and Dan Badger made useful comments on a first draft.

with the comprehensive high school plan, the Population Council, the Ford, Kellogg and Rockefeller Foundations, and various national development organizations including those of Sweden and France. Obviously, an assessment of these diverse efforts within the context of the present paper is not possible. Thus, consideration will be limited to agriculture, with emphasis on the current Nebraska-MASUA consortium program.

Given numerous alternative organization patterns, I have elected to structure this paper along rather conventional lines. First, a minimal description of the Colombian scene, including a brief description of the country's agricultural institutions, is provided. Next, the general Nebraska-MASUA program is outlined and institution building is examined with particular reference to the MASUA-Nebraska project. In the final section, inferences of what we seem to have learned for future programs is outlined. While the scope of this paper is narrow in the sense of relating only to one effort in agricultural development, it is broad in the sense that Colombia is a rather typical South American country in terms of many important social-economic attributes.

#### Country Setting

Colombia, one of the larger countries in South America, has coastline on both the Atlantic and Pacific oceans. It is crossed by the equator and the topography is dominated by three major mountain ranges running more or less North to South. Altitude at different points in the country vary from sea level to almost 20,000 feet. Rainfall in different areas of the country range from less than 5 to more than 400 inches per year. Temperature in the country is largely determined by altitude. Due to the great diversity of climatic characteristics of the country, most of the agricultural crops of the world can be produced in Colombia.

The population of Colombia is approximately 20 million, with about one-half of the population being rural and approximately one-half of the labor force being employed in agriculture. Atypical of South America, there are three major cities in the country. The capital city, Bogota, has a population of 2 million, and Medellin and Cali each have a population of approximately one million. The population of the country is growing approximately 3.5 percent per year, but the three major cities are growing at rates ranging from approximately 8 to 10 percent per year as a consequence of high birth rates and rapid rural to urban migration. It is generally conceded that the population of the cities is growing much faster than employment opportunities (8). Hence, this development has been characterized as urbanization without industrialization.

In 1967, per capita income in the country was approximately \$250 with urban residents receiving approximately \$350 compared to approximately \$170 for rural residents. Although per capita income has apparently increased very little (approximately 10 percent) during the decade of the 1960's, rural incomes per capita have increased by approximately the same absolute magnitude as have urban incomes. Hence, the rate of income increase of rural residents has been greater.

Data with respect to income distribution patterns in Colombia are a bit obscure, but it is clear that incomes are distributed in a very skewed manner and it appears that skewedness is increasing over time and that rural incomes are skewed more than urban incomes. This is particularly true in the upper income levels (9). Thus, personal incomes in Colombia are probably diverging while the country average is, to say the least, not gaining relative to developed countries.

The several sets of agricultural statistics for Colombia are not entirely consistent. However, despite widespread violence in the 1950's which seriously disrupted agricultural production patterns, agricultural prices at the farm level have been stable for approximately the past decade (3). This would of course suggest equal rates of shift in supply and demand schedules for the various commodities, particularly for those where the export market is of minor importance. Thus, it would appear that the recent performance of the agricultural sector has been adequate, although not spectacular. As a consequence, agriculture has not been a negative factor in the country's growth nor has it provided a really dynamic stimula to the nation's economic development.

Although agriculture has grown less rapidly than GDP, it remains the dominant industry in the Colombian economy and still accounts for approximately 75 percent of foreign exchange. However, on a per-worker basis, agricultural labor is generally considered to be less productive than that in industry. With respect to farm sizes, Colombia is a classic case of the dual economy. Farms with less than five hectares account for 63 percent of farm numbers but only 4.5 percent of total land area in farms. On the other hand, farms of 100 hectares or more account for 3.6 percent of farm numbers but utilize 66 percent of the total farm area (10).

All indications suggest that the number of farmers and the number of people engaged in agricultural production will increase in Colombia for the foreseeable future (8). At the same time, the number of opportunities in commercial agriculture are likely to decline. This paradox is of course occasioned by the fact that there is no indication that non-farm employment opportunities will be created at a rate fast enough to absorb projected new entrants into the labor force. Hence a large number of people will be forced to retreat to or remain in the subsistence or poverty sectors of agriculture.

### The Colombian Agricultural Establishment

As a consequence of strong continuing support of the Colombian government, as well as Foundation and other external agency support, Colombia possesses a competence in scientific agriculture, particularly in the plant sciences, which is probably not equaled in South America. Rockefeller Foundation scientists were invited to Colombia in the early 1950's. At that time both agricultural research and extension were administered with the Ministry of Agriculture (probably typical of Latin America today). The competence of personnel within the agency, particularly those in research, was greatly strengthened during the past two decades by Colombian support as well as Foundation and other support for graduate education, primarily in the USA.

In the mid-1960's, after extensive and intensive studies of alternatives on the part of Colombian leadership assisted by USA consultants, the Colombian Agricultural Institute (ICA) was created as an autonomous public agency to conduct agricultural research and to coordinate agricultural education in the country (18). In 1967, national extension responsibility was also assigned to ICA. In 1968, ICA assumed responsibility for quality control of agricultural inputs, regional development, and numerous other functions. Thus in terms of the U.S. experience, ICA is now equivalent to USDA and performs several functions performed by the Land Grant University system and by the Food and Drug Administration.

The National University of Colombia offers agricultural instruction on each of its three campuses located in the three major cities of the country. In addition, six state universities (Cordoba, Nariño, Tunja, Caldes, Tolima, and Santa Marta) offer agricultural instruction leading to the Engineer Agriculture degree. A Michigan State contract in the early 1950's made

significant contributions to the programs on the then two agricultural campuses of National University.

Recently, ICA, in cooperation with National University, has initiated a masters program in the agricultural sciences, and one of the state universities offers graduate work in agricultural economics. The same state university, in cooperation with National University, offers undergraduate level training in agricultural economics and agricultural engineering.

Much has been written relative to the nature and structure of the Latin American University. Suffice it to say that the "typical" Latin American university is characterized by a relatively high degree of autonomy, both on the part of students and the different faculties. Rather typically, a student may be admitted, for example, to the faculty of agronomy and receive all instruction in all courses from professors of that faculty. However, National University in Colombia, as well as several of the state universities in the country, have recently reduced the number of faculties and have organized along lines more consistent with the North American pattern.

#### The MASUA Program

Shortly after its creation, ICA prepared a five year general development plan which was accepted by Colombian authorities and subsequently endorsed by numerous external development investors. USAID agreed to participate in support of the agricultural program along with the Ford and Kellogg Foundations. The University of Nebraska, with the cooperation of the Mid America State University Association Institutions (MASUA), was selected as the administrator-contractor of the combined AID-Foundation program.

The MASUA-Nebraska agreement with ICA is to provide an interdisciplinary agricultural technical assistance team to assist in the development of a

coordinated program of agricultural teaching, research and extension in ICA and National University. The MASUA-Nebraska Mission in Colombia began building toward an authorized staff of approximately 40 persons during the summer of 1966. Thus the Mission has now been in Colombia for approximately three and one-half years, but has been fully staffed for somewhat more than two years.

In addition to the technical assistance personnel stationed in the country, to do research and extension with ICA and to teach in National University, the program provides for a major fellowship program for graduate education, primarily in the USA. The first contingent of fellowship holders educated under this program began returning to the country in 1969. With few exceptions the Colombians holding MASUA fellowships are studying in one of the MASUA institutions. As of December 1969, 90 Colombians were studying in the U.S. under the program and 12 had returned to Colombia and were working with their sponsoring institutions (13). In general, Colombian students have taken precisely the same programs as their North American counterparts, and their performance has been exceptionally good.

The record of performance of fellowship holders is a credit to the fellows and to the Colombians and North Americans who selected the individuals for fellowships. However, it is not clear that graduate training of a Colombian national should be the same as a person preparing to join the faculty at a U.S. state land grant institution. Although Colombia has a large number of trained scientific personnel relative to other South American countries, such trained scientific manpower is limited relative to USA standards. Thus, persons with advanced degrees, particularly the Ph.D., rise very quickly to positions of responsibility involving establishment of goals, objectives, and the structuring of programs of research and education in the agricultural



sciences. On the other hand, although holding a very responsible position the "new" U.S. scientist, is much less involved, at least in a critical sense, in thinking about the employment of agricultural research and education to enhance economic growth and development. Yet, Colombians given precisely the same professional education and being exposed to the same courses and research problems in Graduate School as U.S. classmates are likely to engage in a very similar line of investigation in his own country that his major professor was doing (the current vogue) while he was a student. This orientation may be improved by day to day association with technical assistance personnel as well as with other nationals. Writing the thesis in the home country may be an overated orientation device when the student must satisfy North American requirements.

It would appear that in view of the appeal of the consortium idea, an interesting analysis could be made of the factors contributing to success in the various consortiums which have been tried including the MASUA Colombian one. Such an analysis might provide highly useful insights into matters of inter-university cooperation as well as with respect to relationships between North American universities and institutions in other countries.

The MASUA-Nebraska project is interesting not only from the consortium standpoint but from the standpoint of multiple sources of financing. Major support has been derived first from a USAID contract and since January 1, 1969, from a USAID loan. However, the Ford Foundation is making an important contribution to the contract in partial support of agricultural economics and the Kellogg Foundation is supporting part of the work in extension education. Multiple funding sources, with varying policies and perhaps objectives, clearly create an administrative challenge. In the initial phases of the Nebraska project, a one-staff concept was defined and adopted. In essence,

the government of Colombia, the University of Nebraska and the three sources of financial support agreed that all staff, regardless of source of funding, would be eligible for the same benefits and subject to the same personnel policies. This concept and agreement obviously required considerable flexibility on the part of all parties concerned. Yet it has operated effectively and one would guess, much more effectively than would have been the case under any other management scheme.

There are of course advantages and a measure of additional flexibility to projects operating under multi-funding arrangements. A good example is the fellowship program. USAID does not permit maintenance nor travel support for dependents of fellows, while the Ford Foundation has typically granted both dependent travel and maintenance and the government of Colombia desired dependent maintenance and travel for fellows under the program. Hence, an agreement was reached by which individuals in agricultural economics, who would normally have received Ford Foundation supported fellowships, are supported by USAID with a like amount of Ford Foundation funds being utilized for dependent maintenance and support in all fields. This instance, incidentally, shows the small degree of flexibility or control which the host country has in setting the conditions for various aid missions, even under loan financing.

#### University Institution Building

Development is seldom non-controversial. Rather, development is change in political, social and economic institutions as well as in technology, and therefore, often may involve reorganization or replacement of existing systems and institutions. One should not be deluded by thinking that Latin American citizens today are similar to the homesteaders of our West, or that the

technology and the institutions that so well served our pioneers can do equally well for the people of Latin America today.

Frequently, it has been suggested that external assistance agents can do little to change the political-social structure of the country, but can make many contributions to the development of the capacity to organize, direct and staff institutions such as those relating to agricultural research, teaching and extension (23). Clearly, institution building must be considered to be one of the major objectives of the MASUA group in Colombia. The various teams of USA consultants which have analyzed the Colombian agricultural scene have, not surprisingly, unanimously recommended an organization along the North American pattern where research, teaching and extension are coordinated within the context of an institution such as a university. This same image has probably guided most of the activities of the MASUA team.

The interest in and emphasis on institution building of the MASUA group is probably shared by most university contracts in the field of rural development. Yet the recent CIC-AID study suggests that

"until very recently there has been little serious study of the theory and practice of building institutions for higher education, even in the U.S. or other countries. Within our Land Grant Colleges many individuals have learned much about the building of agricultural colleges, experiment stations, and extension services, but little serious study has been given to the differences among these institutions and the forces responsible for the development of such patterns." (4, p. 42).

Others would suggest that current personnel in Land Grant Universities in the USA have had little to do with early day building of the institution and have little concept regarding how or why the institutions developed.

The Land Grant Institution agricultural structure constitutes one of the most imaginative social inventions of all time. Yet, presumably, these institutions are concrete reflections of the response of a particular society under specific circumstances over a particular period of time. It is not clear

that these particular circumstances prevail now in Colombia nor in other developing countries of South America. Thus it is not entirely clear that the Land Grant system is the only appropriate model for development efforts in that area (22). It might further be suggested that technical assistance personnel are not always best qualified to determine which types of institutions might be optimum for developing areas.

In 1969 under the leadership of a dynamic new Minister of Agriculture (now resigned) the agricultural sector of Colombia was completely restructured. This restructuring must be viewed as a truly revolutionary reorganization of public institutions serving agriculture. Under the reorganization, ICA received significant new areas of responsibility, and interlocking Boards of Directors for each of the major agricultural institutions and the agriculture industry were established.

Perhaps it is significant to note that this structuring of the institutions serving agriculture was strictly a Colombian innovation with no inputs from technical assistance personnel, advisors, nor administrators. On the other hand, it should be noted that personnel trained under the auspices of the various external assistance programs remain in key administrative positions in the new organization. Thus the scientific-administrative skills acquired over the years by these workers will not be lost in the new institutional arrangement.

The role of the University and other Institutions in economic, social and political development is a much discussed subject, both in the U.S. and abroad. Consideration of whether or not Colombian Universities and agricultural institutions are a vital force generating change and transformation of the country is beyond the scope of this paper. However, it has been argued that agricultural economists and other scientists in the U.S. are becoming

increasingly discipline oriented rather than problem or objective oriented (22). If this is the case, and the evidence is convincing, it may not be particularly serious in the U.S. with its abundant resources and sophisticated infrastructures linking public and private agencies to public affairs decision making. However, this is not a trend to be exported to developing countries where such linkages are poorly developed.

Perhaps it should be recognized that there are phases of institution building in which visiting university agricultural technical personnel cannot make a meaningful contribution. For example, in Latin America today one of the "in" types of institution building is that of organizing small farmer groups which include both organizational and agricultural educational activities. This work is being done by non-university entities such as labor groups. Some argue that this is necessarily the case as university personnel are not oriented to working with "non-establishment" personnel and groups.

#### Contract Staffing Patterns

Despite university emphasis on institution building in other countries, Land Grant institutions have been somewhat less than successful in institutionalizing international development activities within their own campus settings. For example, until recently the number of undergraduate courses relating to international development activities were conspicuous only by their absence. Even in 1970 there are an extremely limited number of career-related international development opportunities available in the USA agricultural establishment. To my knowledge there is no development in the Land Grant system that parallels, for example, the Harvard Development Advisory Service.

Perhaps the typical person with international experience may be an individual who has taken a two-year leave of absence from his own institution to work for another university contract abroad. Thus typically he has had little or no specialized professional preparation for an overseas assignment, particularly as it relates to institutional building in a different setting. Further when he returns to his home institution his domestic duties are seldom even peripherally related to his overseas assignment. Thus, from the standpoint of the individual, the international assignment is often noncareer related and noncareer continuous. From the standpoint of the university, the structure is not present to permit the staff members' newly-gained insights to contribute to ongoing university activities.

The Colombian program is a very large one which few institutions could staff with permanent faculty members from their own university. This of course, was the basis for the MASUA consortium cooperation with Nebraska on the Colombian project. Despite the fact that several strong agricultural colleges are included among the consortium numbers (Nebraska, Kansas State, Oklahoma State, Missouri, Iowa State and Colorado), and despite the fact that the original concept was apparently that of permanent faculty of the MASUA institutions performing the technical assistance duties in Colombia, the project to date has not been primarily staffed by permanent faculty of the MASUA member Universities. A somewhat crude summary of staffing patterns to date is contained in Table 1.

Table 1. Selected Characteristics of Staff and Former Staff, MASUA-Nebraska Colombian Project as of December 31, 1969.

Item	Number
<b>General Information</b>	
Employed - - - - -	50
Returned - - - - -	20
Three Months or More Previous International Experience - - - - -	24
Served Two Years or Less - - - - -	20
<b>Previous Staff Position</b>	
MASUA Institutions - - - - -	21
With Leave- - - - -	(13)
Nebraska - - - - -	6 <sup>1</sup>
With Leave- - - - -	(4) <sup>1</sup>
Other Universities - - - - -	11
Other (Including Graduate School)- - - - -	<u>18</u>
Total	50

Source: University of Nebraska, Office of International Programs.

<sup>1</sup>Included in MASUA data.

Little has been written relative to optimum size of technical assistance teams. Perhaps the range in size should be between that which constitutes a critical mass and that which tends to result in a program effort essentially independent of country programs and institutions. When the team is small it is probably easier for the group to work within an institution and with nationals. As the team becomes larger, given language and cultural barriers, there may be a tendency to create enclaves within the national institution with goals and objectives at best loosely related to those of the national institution. Such a development may well result in excellent research but in little upgrading of national personnel or institutional capacity to perform when the technical assistance team leaves.

In the plant sciences, ICA and national University had the capacity to absorb a large technical assistance team. Yet even in this area the ratio of technical assistance personnel was probably high relative to successful Rockefeller experience in Mexico and certainly in Colombia. In agricultural economics, the original staffing plan called for three senior professors and three post prelim instructors in Bogota with one senior professor in Palmira and one in Medellin. In retrospect, the program in Bogota may have been over-staffed as initially, there was only one Colombian in the Bogota program with the M.S. degree. It is possible that the same was true in the early phases of the Peru program at La Molina. Unfortunately, at this state, such evaluations must be essentially subjective.



### Building Research Competence

As a consequence of the short-term agreements involved, and probably other factors, university assistance efforts abroad have not tended to emphasize either basic or adaptive research nor research institution building. This despite the fact that there is now apparently a clear concensus that agriculture is of central importance to economic development. Furthermore, there is accumulating evidence that increased investments may be made in the agriculture of developing nations (12).

Most would agree that a necessary ingredient of agricultural development is significant technological breakthroughs which can be developed only by a strong program of adaptive agricultural research. This is a major shift in thinking from the early 1950's when most would have argued that ample technology was available, but that a strong extension program to gain adoption of known technology was needed. This misreading of evidence is no doubt one of the major reasons most university development programs have had a strong bias toward concentration of investments in extension activities as opposed to basic or applied research.

Perhaps there are two basic research philosophies relevant to international agriculture development. The one school of thought would suggest that researchers are most productive if permitted and encouraged to follow individual interests and leads. The other would suggest that given limited funds, certainly typical of the underdeveloped world, research should be mission-oriented or mission-directed. Under this philosophy, objectives would be established and research specifically designed to remove impediments to the attainment of the stated objectives (16).

As one views the South American scene, there is considerable evidence to suggest that agricultural research activities in South America tend to be

remarkably similar to current activities in the USA. Some have characterized this phenomena as North Americanization of South America research. This is not surprising in view of the emphasis on the USA as a site for graduate education of South American scientists. However, one would be surprised if mission-oriented research on the two continents would lead to similar projects and approaches.

One observer of the Colombian scene has suggested that most of the corn producers in Colombia utilize primitive techniques often on rather low quality soil. Yet there have been numerous field days demonstrating improved corn production methods for large scale producers but no field days emphasizing improved production technology for small scale producers (17). If agricultural technology is scale selective, that is if a given technology or package of technology is not adaptable to both small and large scale units, this would appear to be a serious indictment of the research allocation pattern.

One might argue that if agricultural technology is scale selective, improvement of agricultural technology for large scale producers would tend to benefit a limited number of producers in Colombia while many producers may be injured, both in an absolute and relative sense, through product price impacts. This would tend to further skew the income distribution within the farming sector and within the total economy. It appears that the so called second generation problems will be of increasing concern to agricultural economists and others interested in international development in South America (11).

No one would seriously argue that a simple redistribution of income would solve economic and social problems in South America. Yet the marginal distribution of benefits in developing countries would appear to be more critical than in a country such as the U.S. Of course it may be argued that a highly skewed pattern of income distribution can be altered only at cost of total

product. The evidence on this point is far from clear. U.S. agricultural economists have devoted scant attention to distribution effects, but in Latin America the social justice dimension cannot well be ignored. Would research show that agricultural technical assistance programs have been progressive or regressive in their impact? If distribution of total product goals are competitive, what combination of the two is optimal?

There is considerable literature now appearing in the development field which compares and contrasts the Mexican and Japanese-Tawian models of agricultural development (21). In the former case, that is, Mexico, the new agriculture technology has apparently been that adapted to large scale producers utilizing high quality resources. On the other hand, technology in Japan has apparently been more or less scale natural. It is significant that in the case of rice, improved technology in Japan has been widely dispersed among small and large producers, while in South American countries, Colombia being no exception, productivity improvements in rice appear to have been largely restricted to large scale producers under mechanized-irrigated conditions. In the Japan-Mexico comparison, are these differences in the physical or human resources or differences in the manner in which agricultural research has been directed?

Obviously it is possible that technology is neutral with respect to scale but that institutional factors, such as systems of land tenure and pricing of resources and products tend to skew benefits. Thus it is possible that researchers respond to apparent price relationship rather than to what is currently the trend in the USA. For example, in several Latin American countries, including Colombia, capital in agriculture is priced below market rates while labor tends to be priced above equilibrium rates. Thus it is possible that researchers creating labor saving technology are reacting to the felt problems of commercial farmers faced with such a set of factor prices.

There is no evidence to suggest that South American professional agricultural workers are more or less dedicated to their profession nor that they are inherently more or less capable than their North American counterparts. However, in general, the background and experience of South American workers tends to be different from those in North America. This is largely due to the fact that although education is highly treasured, and difficult and expensive to obtain throughout Colombia, it is particularly difficult in rural areas. As a consequence of this, university students are not from rural areas and lack day to day experience in agricultural operations and exposure to rural problems. Further, some have suggested that agriculture has not historically been a prestige profession in Colombia. Hence, many students may have matriculated in the faculty of agronomy because they could not gain admission to more prestigious faculties such as the faculty of medicine or law. Whether or not this is in fact true, or whether it is indeed different from the U.S. situation, is debatable. Nevertheless, one might expect persons with urban backgrounds to view research priorities in a somewhat different light than those with a more rural background.

The MASUA mission in Colombia has without question had a major impact on the agricultural research program of the country institutions. However, to date, there is no real evidence that basic research objectives have been changed by the Mission. Further, despite considerable efforts on the part of the mission to bring about an integration of teaching on the National University campus with research and extension in ICA, there still is little interchange or integration of personnel between the two institutions.

The first two international agricultural research institutes (IRRI and CIMMYT) have shown that concentrated effort on narrowly defined, mission oriented problems can achieve highly significant research results. Whether

the same success will be achieved by the two newer institutes (CIAT and ITTA) is yet to be determined. However, it should be noted that these institutions are not country institutions and are free from many of the limitations and restraints which plague the development of first class research competence in individual countries, including the U.S. In fact it has been suggested that the creation of international center system may lull developing countries into a sense of complacency which might inhibit the development of indigenous country research institutions. There is, however, no real evidence that this is occurring. It should be clear that the international institutes are extremely small relative to research needs in the developing world and are in no sense a substitute for development of individual country research and education competency.

#### New Teaching Programs

At the time the MASUA-Nebraska agreement with ICA was finalized, Colombian competence was much greater in the plant sciences than in the other fields of agriculture. This was of course due to the strong Rockefeller Foundation emphasis on the plant sciences. In the teaching area, the nine campuses offering undergraduate work in agriculture each offered the engineer-agronomo degree and two offered a degree in veterinary medicine. The Ing. Agr. degree has typically been a five year university degree which might be likened to a degree in general agriculture in this country but with more emphasis on the plant sciences. Thus there were no programs in animal science, and no specialization in the various agricultural fields.

As a consequence of the work of the MASUA-Nebraska mission, work in the animal sciences is now offered in National University and the veterinary medicine curricula has been greatly strengthened by increased emphasis on

clinical activities. In addition, undergraduate programs (careers) in agricultural economics and agricultural engineering have been initiated within the National University program. The earlier Michigan State contract along with Wisconsin land tenure activities and FAO, had resulted in the training of several agricultural economists to the M.S. level. Also the Rockefeller Foundation and the University of the Valley had initiated some training in agricultural economics. Yet the profession was essentially initiated by the MASUA-Nebraska group. The same can be said for agricultural engineering.

Several consultant teams which studied the Colombian agricultural situation in the early 1960's recommended the establishment of graduate programs in agriculture within Colombia. A small graduate program in agricultural economics at the masters level was initiated by the University of the Valley with Rockefeller Foundation support in 1968. At the same time, an agreement between ICA and National University established ICA-National University cooperation for the purpose of offering advanced training in various agricultural sciences. Thus the ICA-National University graduate school currently offers the M.S. level training in the various plant sciences, animal sciences, agricultural economics, agricultural engineering, entomology, and extension-communications.

Without the assistance of the MASUA-Nebraska team members, it probably would not have been practical for Colombia to offer undergraduate work leading to specialization in agricultural economics, agricultural engineering, nor the animal sciences, and the initiation of graduate training would have been difficult. In the long run, the establishment of graduate training competency within Colombia may constitute the major contribution of the MASUA-Nebraska group. If South American agricultural institutions and research do tend to be overly "gringorized", then what is needed is the development of indigenous professions concerned with South American problems and

possibilities. Perhaps the most effective way of achieving such an indigenous profession is the establishment of indigenous training institutions.

Given the current Colombian competence and the availability of large numbers of North Americans in Colombia, there is no reason that graduate training in Colombia should be in any way inferior to that in the U.S.A. Further, given the rapidly growing scientific competence within the Colombian community, there is no reason that all of the teaching at the Masters level should not be done by Colombians in the very near future. Further, in certain areas of the plant sciences, particularly plant breeding, there is probably sufficient Colombian competence to offer the Ph.D. degree.

Graduate training programs in agriculture have recently been inaugurated in other Latin American locations such as Vicosa in Brazil, La Molina in Peru and Chapingo in Mexico. Nevertheless, there is reason to think that Colombia has the potential to make a major contribution to Latin American agricultural education on a regional basis. There seems to have been a tendency in much of Latin America to isolate agricultural training from general university education. For example, the graduate training centers mentioned in Brazil, Mexico and Peru are all located in agricultural schools or universities that do not offer a broad range university training. On the other hand, National University in Bogota, the site of the ICA-National University graduate program, is a complete university. Given the excellent supporting work in general economics, basic sciences, statistics, etc., it would appear more feasible to develop quality doctoral programs in the agricultural sciences than would be the case in the more limited agricultural type university. It should be noted, however, that there are other universities, for example, those in Chile and Argentina, that appear to have the advantage similar to those in Bogota.

Presumably, in the future, there will be greater emphasis on M.S. training in Latin America. In reality, there seems to be little reason to send Latin Americans to the U.S. for M.S. training in most agricultural fields. The advantages of graduate education in South America are of course in terms of lower cost, the possibility of developing a truly indigenous profession, and the provision of more scientific research manpower in Latin America in the form of research assistants. Given a number of good Latin American graduate institutions, fear of serious inbreeding would seem not to be well founded.

There are of course impediments to expanding the number of graduate students in Latin American institutions. In the past it has been more difficult to support graduate students in Latin America under USAID financing. Recent changes in dollar expenditure requirements may have eased this problem. In addition, there is clearly a prestige factor which favors training in the U.S. or in another country abroad. Presumably this block will be overcome as it becomes apparent that Latin American trained scientists are as good as those trained abroad. To achieve this, it is clearly imperative that some of the countries' first rate students be trained in Colombia. There may be a tendency to send the students abroad who have considerable language facility. This is not a good criteria, not because language and scientific ability are correlated, but because it is important that all Latin American scientists be able to readily read scientific documents in English.

Despite the development of indigenous graduate institutions, for a number of years in the future large numbers of Colombian and other South American students will be coming to the U.S. for graduate training, particularly at the Ph.D. level. Thus, it would appear appropriate for institutions interested in international development to give some consideration to the nature of the real graduate needs of such students. Such individuals will be future



leaders in their countries. Hence, if we are really interested in their changing institutions within the country, perhaps the most direct means would be to give South American students in this country an opportunity to become acquainted with U.S. institutions and with institution building strategies. One possibility would be to structure such a program as a language substitute in Ph.D. programs. The program could consist of seminars with USDA and Land Grant administrators as well as structured field visits to extension offices, credit agencies, etc.

#### Summary Questions-Inferences

1. Can the development of competence in international agricultural technical assistance be institutionalized as a part of the role and mission of the Land Grant system?

U.S. AID directors, including Dr. Hannah, have emphasized the importance of the University-AID partnership. However, if the university role is restricted to that of acting as an administering agency to assemble a staff to perform a specific job without previous or subsequent relationship to on-going activities, real benefits to the university are not obvious. Further, if the university is to largely rely on free agent professional staff, as opposed to permanent faculty, in such work, it is not clear that AID could not perform the role equally well. AID could elect to build a career in-house professional core to perform international technical assistance duties. It is possible that this approach could contribute more to the institutionalization of international technical assistance efforts than the university contract route.

If a relatively large permanent AID staff is not considered to be feasible, private enterprise offers another alternative to the university. One can

hardly fail to be impressed with the magnitude of the agricultural assistantship programs currently being carried out by companies such as International Development Services, Inc. (IDS), International Research Institute (IRI), and Nathan & Associates. Presumably, such companies could play an even bigger role in future technical assistance programs.

Clearly what is needed is a continuing evaluation of the university's role in international affairs as well as continuing considerations of university relationship with USAID and other funding agencies. Some universities have of course taken major steps to identify objectives and structure programs in the international development area. Others appear to be operating on a rather ad hoc basis. Also, AID-University relationships have been under continuous review and major changes in this relationship appear to be in the offing (20, 6).

Clearly, the degree to which Land Grant universities find it possible to institutionalize international development will depend to a large extent on the funding agencies, primarily, USAID. There is little reason to expect that the individual states will undertake major financing of international development faculties. The foundations, through resource base grants, have in several cases provided such funding. USAID through, for example, the land tenure center of the University of Wisconsin, the agricultural finance center at Ohio State, the Tropical soil lab at North Carolina, and the fertilizer center at TVA, has made major such investments. Clearly, if international development is to be institutionalized within the Land Grant system, the system must have funding to offer career appointments in the field. It is unlikely that short-term contractual funding will accomplish the objective.

2. Should all Land Grant universities attempt to develop comprehensive international development competency?

In the past practically all Land Grant universities have been engaged in one or more international development activities. Would the interest of the universities and the developing countries best be served if a limited number of universities develop quality international programs? An alternative would be for different universities to specialize in different phases, on a geographic or functional basis, of international development. Either alternative might permit a more professional development of competence in international faculties involved in international activities both on and off campus. It should be abundantly clear after two decades that if one is to develop expertise in international development he must be exposed to international environments but that this exposure must be supported by research and teaching on the home campus.

3. Will there be continuing demand for agricultural technical assistance in what is now the developing world?

Despite two decades of rather intensive developmental activity, the gap between the have and have not nations has widened. At the same time it is becoming clear that the objectives of agricultural development must shift from the simplistic one of increasing food production to the more difficult one of contributing to general economic development and social justice. As objectives become more complex national programs must also become more complex. Is it obvious that developing countries will continue to seek or accept university agricultural personnel to attack the emerging later generation problems?

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