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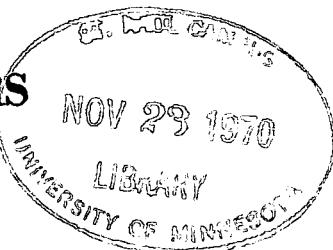
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NATIONAL GRADUATE CENTRES IN AGRICULTURAL
ECONOMICS IN LATIN AMERICA²

THE development of national graduate centres in developing nations merits substantial consideration. Among the supporting arguments are: courses can be made more relevant, students can analyse their own national and regional problems, the master's programmes can help select the most competent for Ph.D. training overseas, the cost of training may be lower, or more nationals can be trained for the same cost, graduate research can become a significant addition to the national research resource, and the pressure of overseas students upon crowded graduate programmes can be reduced. Negative arguments centre around whether adequate quality can be attained and whether sufficient students and local teachers can be attracted to result in a real reduction in training costs per student.

Since 1960 at least ten graduate programmes in agricultural economics have been announced by universities in Latin America, mostly in association with graduate programmes in other agricultural sciences. An analysis of these programmes can help identify problems inherent in establishing new master's programmes, and throw light on the arguments listed above.

During 1967 and 1968, the authors visited with the faculty, graduates, the employers of the graduates and other interested people about the accomplishments in training students at five of the longer established graduate programmes. Each centre receives outside aid, either through USAID or the Ford Foundation. Samples were also drawn of Latin American students who received the master's degree in U.S. universities, and of U.S. students terminating their graduate study with a U.S. master's degree. More than 300 people were interviewed in Latin America and another 100 or so contacted with mail

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² Reviewed 15 December 1969. A longer report concentrating on the Brazilian graduate centres is being published under the title 'O Treinamento de Pos-Graduação e o Mercado de Trabalho para os Economistas Rurais no Brasil'.

questionnaires. Questionnaires were received from fifty-two students completing a U.S. master's degree.

This article, a summary of our findings, describes the programmes briefly, discusses the principal problems as seen by various audiences, compares U.S. and these Latin American training programmes, touches briefly on the professional market and concludes with a discussion of some of the inter-institution and inter-nation competition which press potential financial sponsors for assistance in new, continuing or expanding programmes.

The Evolving Graduate Programmes

The five graduate centres being reviewed include:

Instituto de Economia Rural of the Universidade Rural de Minas Gerais, *Viçosa*,¹ Brazil, started in 1961 (with Purdue assistance).

Instituto de Estudos e Pesquisas Económicas, Universidade Federal de Rio Grande do Sul, *Porto Alegre*, Brazil, 1963 (Wisconsin).

El Colegio de Postgraduados de la Escuela de Agricultura, *Chapingo*, Mexico, 1965 (Iowa State).

Escuela de Graduados, Universidad Agraria, *La Molina*, Peru, 1966 (North Carolina).

The graduate programme of the Escola Superior de Agricultura 'Luiz de Queiros', *Piracicaba*, Brazil, 1966 (Ohio State).

Other graduate centres in Colombia, Chile and Brazil are too recent for an evaluation of their product; the older programme in Costa Rica, recently revised, would have been costly to review since its graduates are widely scattered. Even for the five institutions reviewed here, some conclusions must be tentative. The number of students enrolled and their progress is shown in Table 1.

Of the five centres, the programme at Viçosa dominates the list with 45 per cent of the total enrollment and 85 per cent of the completions. Even for 1966 and 1967, discounting for the longer time it has been operating, Viçosa has 30 per cent of the admissions and 75 per cent of the completions.

Many similarities in the curricula exist among the five master's programmes, but differences also appear, reflecting the available teachers, programme objectives and the accumulation of experience.

¹ For brevity, the italicized city in which the centre is located is used for identification.

Each requires about two years time for the fairly competent student, but the first class at Viçosa averaged thirty-one months, and others have comparable early experiences. More recently, a few students completed the programme in sixteen to eighteen months.

TABLE I. *Record of graduate student enrolment and master's programme completions in five graduate schools in Latin America*

Years entered	Viçosa Brazil			Porto Alegre Brazil			Chapingo Mexico			La Molina Peru			Piracicaba ¹ Brazil		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
1961	11	11	10	..	..	..	..	..	..	..	..	..	..	..	..
1962	11	10	8	..	..	..	..	..	..	..	..	..	..	..	..
1963	16	14	11	9	5	1	..	..	..	..	..	..	..	..	..
1964	11	10	8	12	5	2	..	..	..	..	..	..	..	..	..
1965	19	15	12	7	6	2	10	5	1	..	..	..	..	..	..
1966	18	16	12	2	1	0	15	14	3	11	5	1	26	18	1
1967	17	12	3	9	8	0	10	6	0	16	2	0	..	..	..
Total	103	88	64	39	25	5	35	25	4	27	7	1	26	18	1

A = Number entering.

B = Number finishing course programme.

C = Number completing theses and receiving degree.

¹ Piracicaba admits students only on an alternate-year basis, with ten new students enrolling in 1968.

The programme of study at each of the five graduate institutions is indicated in Table 2. Each programme includes courses in economic theory, research methodology, statistics, economic development and agricultural marketing. All of the programmes also include a course in production economics or farm management. Most programmes provide a second course in statistics (not always from the beginning), a course in rural sociology (3 of 5), a course in public policy (3 of 5) and a second course in economic theory (4 of 5) (at Viçosa the existence of a farm-management course permits production economics to serve the same purpose). The programme also includes a substantial amount of time for the preparation of the master's thesis, including time between terms, and part or all of the second year. As the programmes become better established, new courses are added and options appear.

The centres have not yet evolved much specialization. Each is developing general agricultural economists. Although rural sociology students are encouraged to enter several of the programmes, the bulk of the training is for agricultural economics.

Some of the differences which appear in Table 2 become less striking when detailed courses are considered. Thus, the absence of the title production economics at three of the centres means that much of the subject-matter is taught under farm management. Individual courses, even at the same institution, will vary somewhat with the teacher, the textbook used and the ability of each incoming group of students to follow the pace. Still, a number of differences exist. Piracicaba has a five-year undergraduate programme preceding the graduate programme, which permits the latter more freedom to diversify. At Chapingo, in an attempt to upgrade weak undergraduate work, a course in principles of economics is offered during the first term. At La Molina fiscal policy is required on the assumption that a large proportion of the graduates will work in government offices and will need such concepts. Despite the large Indian populations in Mexico and Peru, neither of them offer a course in rural sociology, while each of the three Brazilian institutions does so. Differences exist in the prerequisites, reflecting differences in programme objectives and in the importance given to the opportunity costs facing the students.

A significant number of courses have been taught by non-nationals; student appraisals rate these teachers as high and sometimes better than their national counterparts, despite problems of language and culture. Foreign professors¹ and universities have made a significant contribution in curriculum development, in teaching, in helping create prestige and in research and thesis supervision. The outside contribution from high to low appears to be:

<i>In teaching</i>	<i>In research</i>
Chapingo	La Molina
La Molina	Chapingo
Viçosa	Viçosa
Porto Alegre	Porto Alegre
Piracicaba	Piracicaba

A high listing means a larger dependence, not necessarily a more effective contribution from the outside institution.

The writers developed some tentative judgements on the strengths and weaknesses of the curriculum, at least on a comparative basis, as follows. The current programme at Piracicaba has less rigour and training in the fundamental tools of economics and statistics, and does

¹ Mostly U.S., but includes one Australian and one Chilean.

not convey a strong sense for involvement in problem solving. Chapingo goes quite far towards rigour, with little practical work appropriate to the terminal master's candidate. The disciplinary emphasis at La Molina seems narrow for the problems the country faces, for example, no course in sociology despite the country's large Indian population. The absence of prerequisite courses at Viçosa, despite

TABLE 2. *Titles of courses in five agricultural economics graduate programmes in Latin America*

<i>Title of courses</i>	<i>Viçosa Brazil</i>	<i>Porto Alegre Brazil</i>	<i>Chapingo Mexico</i>	<i>La Molina Peru</i>	<i>Piracicaba Brazil</i>
Economic Theory I	X	X	X	X	X
Economic Theory II		X	X	X	
Research Methodology	X	X	X	X	X
Farm Management	X	X		X	X
Production Economics	X		X		
Statistics I	X	X	X	X	X
Statistics II	L	L	X	X	
Economic Development	a	X a	X	X	X
Public Policy	X		X c	X	
Agricultural Marketing	X	X	X	X	X
Rural Sociology	X	X			X
Land Economics	L		L		X
International Trade				X	X
Public Finance				X	
Price Analysis	L		b		
Community Development	L				X
Diffusion or Extension		L			X
Mathematics I		L	X		
Others, no.	2L d	1L e	4L f		1X g

Courses are semester courses, X means scheduled from the initiation of the programme, L means introduced later.

- a. Combined with public policy.
- b. Title formally included with agricultural marketing.
- c. Agricultural development.
- d. Agricultural credit, agrarian reform.
- e. Mathematics 2.
- f. Principles of economics, econometrics, statistical sampling, natural resources.
- g. Social systems and the transformation process.

the range in student backgrounds, creates problems for the less well-prepared student—poor performance, repeats, or smaller course loads, and thus a longer time in the programme. But the unusually competent, though poorly prepared student, faces lower opportunity costs at Viçosa than at Chapingo and probably at La Molina. Porto Alegre turns its back on many of the resources of the economic faculty, despite the advantages of its special academic location, and does not seem to have established adequate relationships with the potential

users of the graduates. Only Viçosa, so far, has a good record on thesis completions, albeit at some sacrifice in quality for some of the first students who, after long delays, have completed their theses.

But the five curricula provide a reasonable list of courses, within which individual professors, by defining the course content, can develop strong programmes or weak ones. Too, curricula and course content should reflect national and regional needs, not the standards developed in another country for its own needs. A required course in economic development is one such adaptation to Latin American needs.

Attitudes Towards the Programmes

Most of the students who completed the course programmes were loyal alumni, quite satisfied or fairly well satisfied with their choice of schools, though many did make criticisms in detail. Only for the new programme at Piracicaba did a majority of the students feel that they should have gone elsewhere. Newness is not an adequate explanation, if compared with the reactions of first-year students elsewhere. But, perhaps the first years of a new programme face greater challenges and criticism when it competes with already established centres. In terms of personal and social activities, the city of Piracicaba was rated high, while Chapingo and Viçosa were rated low.

The academic environment drew mixed reactions from students and among items the lack of study space was commonly mentioned. The library received mixed comments. Another important issue was the limited availability of professors to help select thesis research topics and to assist in carrying them out. At Viçosa this situation was more nearly adequate with some help from U.S. professors; elsewhere the foreign professors carry a heavy thesis research load, while for Piracicaba this function is not yet adequately performed.

Indicative of a limited concern for student welfare is the almost universal complaint that 'The schools do not help the students find better jobs'.

Students were asked to appraise courses and teachers. As expected the range is wide and few trends can be discerned. Students in Mexico and Peru tended to rate all courses and teachers high, possibly because they were responding to a foreign interviewer. Brazilian students, responding to a Brazilian interviewer, gave average or better ratings to most foreign professors, in general somewhat higher than

the national professors. Frequent reassignment of courses generally coincided with a low rating, but in some cases the rating of a professor declined in the third or fourth offering of a course. In view of the ratings and the oral comments during the interviews, the writers believe that the foreign professors usually performed well as graduate teachers.

The faculty in the graduate centres were less critical or more defensive than the students. They have a broader concern, with budgets to finance the programme, with salaries commensurate with their expanding responsibilities, and with facilities for graduate student life and work in a scholarly environment. The national professors, however, usually are more interested in courses than with research, and do not place high priority on individual exchange with students in either the teaching or research function. Many students report very limited contact with their major professors or committees.

Intellectual exchange through the transfer of students or professors among centres (relevant for Brazil) does not appeal to professors. In-breeding and institutional competition tend to prevail. They appear more interested in interaction with prestige universities and professors abroad than with colleagues in other national universities.

Employers of graduates judging the final product (our conclusions stem largely from Brazil because the current numbers are greater), believed that the graduate experience usually made the employees more valuable. Their oral comments are validated by the fact that they continue to send current employees to the centres, at the employers' expense, and additional employers are beginning or plan to do the same. On the other hand, except in Mexico, the salary levels for the graduates do not demonstrate a high regard for graduate training. Increasing responsibilities, however, have been assigned to many of the graduates.

Programme completion and thesis research are critical problems

The record (Table 1) indicates that a significant number of students did not complete the course work, and a larger number failed to complete, or have not yet completed, a thesis. A variety of explanations appear to apply. Viçosa's rather good record hides a number of at best marginal grades and marginal theses. (Many of the theses for the 1967 class were completed after our interviews.)

The combination of grades given and standards required eliminated

a number of students in the first years at Porto Alegre. When the retention standard was reduced one notch the course completion record improved. Since Porto Alegre did not confer the M.S. degree, providing only a study programme, the motivation for thesis completion was substantially reduced compared with Viçosa. For Piracicaba, eight students (all women) admitted in the second semester had not yet arrived at the time to complete the course work. Except for them, all have completed the course programme. A long time to complete the thesis is the practice for the first class, and Piracicaba conforms.

Most of the students at La Molina came from provincial colleges scattered over the country. While efforts are made to select the best students through a number of examinations, a significant number choose to drop out after some course experience. Others had to slow down their programme as their employers insisted that they return and give a substantial portion of their time to their jobs. Here also the first theses are taking a long time to complete.

Chapingo students have done reasonably well in course completion. Thesis completion has suffered since many of the students found it desirable to complete their senior thesis (often with help from graduate professors), so as to complete the *ingeniero agronomo* degree. Only then did they turn to the master's thesis.

One of the major potential returns from a regional or national graduate centre is the research output of the students; this can become, as at Viçosa, the major part of the economic research being done in the state. Moreover, most students view the research opportunity as a major reason for graduate study. Yet in this area great differences exist among schools and among professors. In these centres, partly because they are new, the student often has to choose from among national professors whose primary concern is lecturing and whose own research experience is limited, or from among foreign professors either recently arrived and without depth of perception of the local economy or well advanced in his two-year assignment and therefore unable to provide continuity as a counsellor. For these and other reasons, the thesis researches of a number of students usually do not become integrated through a major professor. The accumulation of information and development of understanding functions less well than it might and up to now seldom reaches the interested public as integrated research monographs or policy bulletins. But the need for this process is great.

In terms of actual contact with the major professor they choose, many students desired more supervision and more contact—yet contacts were often substantial. More specifically, Viçosa students averaged 5–20 meetings per semester with their major professor, with one-fourth reporting less than five and an equal number more than twenty. At Piracicaba 40 per cent reported less than five, and only 20 per cent more than twenty. Four-fifths of the students desired more supervision at Piracicaba, compared with one-half at Viçosa. Porto Alegre was in between. For Chapingo and La Molina the contacts were substantially higher. For example, three-quarters of the students at Chapingo reported more than twenty contacts, and four-fifths were satisfied with the degree of supervision. Admittedly, the staffs are relatively small for the functions being performed; usually some special arrangements have to be made for outside professors for at least one course and sometimes several. And such commuter professors (existing more frequently at Piracicaba) do not carry their share of the counselling load. These data and attitudes can be interpreted differently. Many contacts may indicate more supervision rather than the stimulation of independent thinking, self-reliance and self-confidence. Many contacts also could reflect the thesis writer's concern that standards of acceptability were unclear with a consequent sense of need for frequent consultation. Or, the quality of the contacts, on either side, might be so low or the time so short that many more contacts were needed. In general, those students who worked with continuity with foreign professors were pleased with the relationship.

The implementation of the research aspect of the training programme appears to be uneven and inadequate. Correction probably will require further transformation of the graduate centres, if the programmes are to become truly national institutions. This could include more emphasis on research, adequate research budgets, salaries which recognize research productivity and a consequent increased size and continuity of staff. Theses rewritten as bulletins or articles, topics selected such that integrated monographs can be prepared on important problems, on-going faculty research to which these can contribute and a greater account taken of research findings in public-policy decisions, all will contribute to strengthening this aspect of graduate study, and these, in turn, will make it less difficult for the university to obtain budgetary support for its graduate training programmes.

Comparisons for the United States

Interviews or questionnaires taken from twenty-eight Latin American (L.A.) students completing a master's programme in the U.S. and not pursuing a Ph.D. programme (as yet), and twenty-four U.S. students in the same category, provide comparisons between U.S. and L.A. centres and between U.S. and L.A. students.

Most noteworthy, while a thesis is required of all students in L.A., only two-thirds of the students studying in the U.S. did so. A few wrote a research paper, while others took extra course work. No differences on theses appeared between U.S. and L.A. students, except that the former felt constrained in the choice of a topic, probably due to assistantship obligations. The students from L.A. gave high priority to research experience as a reason for graduate study; at least half of those returned from the U.S. are engaged in research; hence the reduced emphasis on a thesis and training for research in the U.S. is a serious weakness.

Similar conclusions might be drawn from reports on counselling. Contacts with the major professor for advice on course work and thesis research are at about the same relatively low level as Piracicaba. Over 40 per cent of the students reported less than five contacts per semester, and only 22 per cent more than twenty contacts, with U.S. students slightly higher. Two-thirds of the L.A. students reported satisfaction with the supervision received, the rest desired more. U.S. students reported less 'supervision' in their thesis and over half would have liked more help. The data did not permit differentiation between course and thesis counselling, or between general guidance and 'spoon feeding'.

Even so, in view of the greater interest in research, the frequent absence of a thesis and the responses on supervision, the training for research seems weak at the master's level, particularly for the student from L.A. Nor is this problem resolved if he chooses a graduate centre in L.A.

The time input to complete the master's requirements averaged twenty months for course work plus six months more if a thesis or research paper was required. The U.S. students averaged sixteen months for courses plus seven months for research.

The student appraisal of the academic environment was higher for the U.S. institution than for the L.A. institution, and higher for the L.A. student in the U.S. than for the U.S. student in the same

institution. The major sensitive issue was the stipend the L.A. student received. Since this averaged \$225.00 per month plus tuition and incidentals, we suspect that inequity among L.A. students may have been more important than the average level of support.

Should more or fewer L.A. students come to the U.S. for study? Certainly, some students have received excellent training whether they studied in the U.S. or in L.A. Clearly, for the Ph.D., they have no alternative but to study overseas. A large-scale increase in the number of students with master's level training depends upon the development of local or regional training programmes, and such programmes will provide and require an increase in the number of Ph.D. candidates who study overseas. Two conclusions emerge. First, master's candidates should be encouraged to attend those schools likely to provide better than average research training and guidance. The future will determine whether this will be in some U.S. or L.A. centre. Second, and if the graduate centres in L.A. continue, relatively more of the limited fellowship budgets probably will be allocated to Ph.D. candidates. Further, the decisions for master's candidates from countries without graduate programmes, such as Venezuela or Bolivia, probably will lean relatively more heavily on the U.S. than for those countries with their own programmes.

The market for agricultural economists

These five graduate centres and the others in early stages of operation are substantially increasing the number of trained agricultural economists in these countries, particularly Brazil. The Sociedade Brasileira de Economistas Rurais has 200 members, with about one-quarter also holding membership in the International Association of Agricultural Economists. The degree status in Brazil in 1968 is estimated:

Some formal post-B.S. or B.A. training	60
Taking courses for M.S.	41
Courses for M.S. completed	53
Holding the M.S.	69
Candidates for the Ph.D.	7
Holding the Ph.D.	<hr/> 1
Total	231

These are impressive numbers, if compared with the handful with graduate training ten years ago.

A review of the institutional estimates suggests that thirty-five new master's degrees per year is a realistic minimum estimate by 1973 to 1975, which means that the seventy-seven holding the M.S. degree in 1968 will increase to over 200 by 1973. Considering the small numbers employed in Brazil in 1960, one wonders where they will find jobs. But many of them were employed in related work before they started graduate work, and actually were sent with salaries for graduate training by their employers, with the expectation that they would return. Thus, much of the graduate programme is a form of in-service training. Only a third to a quarter of the graduate students have not been previously employed and hope to find a first position after graduate study. And the training programmes are continuing, perhaps even increasing. In effect, demand and supply are increasing through the same process.

One interesting aspect of the Brazilian market structure applies to salaries. Students who are sent to do graduate work often receive full salary, other benefits and a small scholarship from the graduate centre to offset dislocation costs. A commitment to return to the employer often accompanies this arrangement. Few of them discuss the course and research programme with their employer, and only a few take on projects of special interest to the employer. Thus, they enjoy a sort of free-wheeling fellowship for about two years and then, usually, return to their employer. Under such circumstances should a salary increase be expected? Frequently the major adjustment has been a lateral movement to a different position. Up to now it appears that most employers have sought to upgrade their staff by supporting training rather than by offering higher salaries or better working conditions to hire employees away from other institutions. Will such a situation persist?

This pattern applies in the Rio-São Paulo-Minas Gerais complex to a far greater degree than in the northeast or the south. Some of the problems of Porto Alegre stem from the lack of recognition by employers of the greater capacity (or change in capacity) that the graduates have. (Alternatively, such graduates because of poor training or lack of employer needs can make only a minor contribution in resolving the problems of this state.) Some graduates appear to be poorly used, shift to jobs not related to agriculture and enjoy few benefits from their training. If agricultural economists have a role to play in south Brazil, then more effort needs to be made to develop the demand side of the market, perhaps with modifications not only in the working

assignments of the graduates but also in the training programme. Quite possibly, prospective graduate centres in some other developing areas would face similar problems in attracting students and marketing their graduates.

In Mexico the system is quite different. Relatively few attend graduate school with salary; instead they take leave and receive a scholarship, usually smaller than their previous salary. The employer often contributes to the scholarship fund. Nearly half left some job to pursue graduate study. The completed graduate, the holder of an advanced degree, does enjoy a higher salary of around 40 or 50 per cent. There is some indication that the proximity of Mexico to the U.S. and longer-term flow of students across and back may explain this difference.

The market for agricultural economists seems to be increasing slowly, with a few significant well-paid positions available in the Mexico City area, but the market is thin. Unless Chapingo increases its numbers, it appears that graduates will continue to have some choice of jobs. Chapingo itself faces personnel problems, since its current salary level for well-trained professors (with Ph.D.s) is less than that paid by agencies in Mexico City. Both Viçosa and Porto Alegre also face this problem of relatively lower salary levels.

Peru seems to have the worst of the two systems: employers grant leaves with pay but recall the student after some months under threat of cancellation, or force the student to drop back to a part-time student. Fellowship money has not counteracted this situation. Also, partly because of a wage freeze, employers do not give much recognition to the completed graduates. The numbers, however, are too small to give much support to any generalization.

Cross-National problems with existing graduate centres

One of the important cross-national problems is the local acceptance of an internationally built institution. Of the many ramifications of this issue, attention up to now has concentrated on the local acceptance of the idea of graduate training, but turns now to the host country's willingness to allocate the funds, personnel and research facilities necessary to a long-term, on-going programme. Following this, some attention will be given to the among-country allocations of international support.

The agricultural part of the USAID programme in Brazil helped strengthen the programmes of four agricultural colleges, through

technical assistance from four counterpart U.S. universities. Thus, USAID provided partial assistance to the three graduate centres reviewed here, and to a fourth institution in the north-east (School of Agriculture of Ceará, with assistance from the University of Arizona), which is contemplating a graduate centre.

The Ford Foundation provided substantial assistance to the rural economics programme at Viçosa, some initial support at Porto Alegre, and is the major outside sponsor to the programmes at La Molina and Chapingo, primarily to support U.S. university assistance and the advanced training of national professors. In most cases the Ford Foundation support has concentrated on the graduate programme in the rural social sciences (and complementary work in statistics), in contrast to USAID support to undergraduate and graduate training, to research and to a broad spectrum of agricultural disciplines.

Substantial support also has been provided by the host institution to the graduate programmes, utilizing state and national financial resources. But even so, some USAID and Ford funds have supported certain capital investments or local operating costs in some of the institutions. Vicissitudes in the willingness of L.A. governments to appropriate local budgets have created uncertainties in the operation of several of the graduate centres, particularly for Viçosa in 1967 and 1968.

None of the five programmes reviewed has yet become independent of non-national support, even though the national intellectual contribution now constitutes a major share of the teaching and research input in most of the centres. While internal leadership is developing, the centres have not yet become independent of foreign intellectual leadership. This may be partially attributed to the fact that, for international assistance, the criteria are high as the programmes tend to be evaluated against U.S. or international standards, even with some recognition that the programmes should make sense for national and regional needs. At the same time, these pressures help offset influences that would lead to undue parochialism. The local national administrators have not yet had to 'sell' the educational centre to local political leadership as the exclusive financial sponsor, and thus have been freed, to some degree, from tough compromises on quality, level, scope, content and size of programme. Also, an argument can be made that outside help should continue since international agencies provide financial support which otherwise would be spent for expensive international scholarships. National programmes expand the size of the profession more rapidly but also increase the number and

quality of candidates seeking overseas training beyond the M.S. degree. Finally, even if the over-all objective of implanting a locally supported graduate centre were successful, these centres would create specific research ideas that often would compete successfully for international funds. Thus, it seems unlikely that any presently active centre should be or will be independent of international support for a decade or more into the future; rather the support will phase into new efforts as the basic programme becomes more self-supporting. We conclude that a realistic view of a new graduate centre in a developing country should contemplate a decade of international support for general development and, if success is attained, another decade of support of particular, imaginative ideas appropriate to the country's needs.

Another problem, now clearly in evidence in L.A., relates to the number and location of graduate centres. At least five or six other centres have been started or seriously contemplated, many with the hope or expectation that international funding will be possible. Can the country representatives of a public agency deny a request because a centre is already functioning in the neighbouring province or country? Is it any easier for a private foundation to do so? Criteria can be developed to identify institutions that warrant serious consideration, but problems arise in applying such criteria across national frontiers to deny one country a programme and to support one in another. Moreover, with limited knowledge of the amount of help and length of time required to develop reasonable graduate programmes, costs will likely be underestimated and a given total spread too thin.

More positively, we suggest that some efforts be made by the several actual and potential sponsors to draw in other nationals, to defuse some of the inter-nation rivalries by providing such items as scholarships for students from nearby countries that do not have graduate centres, by drawing on professors in nearby countries for advisory roles in the policies (especially research) of the graduate centre, and perhaps assigning to such professors responsibility in recruiting students and serving as research advisors. In the long run it could be much less costly to spend some funds in this way than to support another competing graduate centre. But in doing so, a more logical pattern would follow if a regional consensus prevailed as to the probable number and location of the centres. A review of U.S. history in this regard provides no answers, only a clearer view that a relevant problem has been identified.

Some internationalizing of the student body has already been achieved in the three oldest centres with a total of twenty-six such students, or about 14 per cent. Chapingo is particularly anxious to be useful to Central America; more than a quarter of their enrollment has come from outside Mexico. But no centre has an outreach to colleagues or institutions in other countries for sharing any phase of the training responsibilities. Probably they have been too busy creating the programmes to give much attention to such activity.

Summary and recommendations

This examination of the evolving graduate centres emphasizes the following points.

International financial and personnel assistance have helped develop graduate teaching programmes in L.A. that provide graduates able to cope with some of the agricultural economic problems of their country. The actual programmes range in quality from the training of students prepared to become Ph.D. candidates abroad to programmes which place more emphasis on upgrading and providing some special competence to students holding the *engenheiro agronomo* degree. Despite some criticism in detail, and for some centres more than for others, most of the students and their employers believe that the additional training has definitely increased the capacity of the graduates to cope with local problems.

Both the supply and the demand for agricultural economists have increased substantially in Brazil, due in significant measure to the operations of the graduate centres. It is too early to draw conclusions for Peru and Mexico. In Brazil the process has worked better in the south central region than in the northeast and the south. The recruiting system in Brazil, by which employers post employees to a graduate centre with full salary, in effect creates an increase in the supply and the demand simultaneously. The employers' decisions to continue and to increase the numbers being posted confirms oral testimony that the process is working and that most of the graduates return to and become more useful to the employer.

The research dimension of the graduate training receives substantial emphasis among the students' objectives. The implementation of this aspect of the training is inadequate, even in the longer-established programmes, but for different reasons. The role of the graduates as innovators in research, as creators of research, is far greater than the role that holders of master's degrees play in the U.S. But the L.A.

student has less opportunity to observe an on-going research programme and to receive imaginative guidance in identifying for himself important researchable problems. Also, in the newer programmes, the advisory and supportive functions and the criteria for a successful thesis are not functional. In the more-established programmes the pedagogical functions of the thesis tend to be over-emphasized, while the process of knowledge accumulation—building upon previous studies—and the integrative, comprehensive analysis that incorporates several theses into a major monograph, receives scant attention. Publication of thesis research, with or without revision, is infrequent. Yet for the long pull, publications such as these help attract positive responses from national fund-providing agencies.

Improvement in the over-all research and thesis situation is occurring; a more rapid improvement could substantially increase the quality of training in these five graduate programmes in agricultural economics. It will not be easy to do so. In the L.A. setting the recipe includes specific research responsibility along with an adequate recognition in salary, a continuity of research functions, so key individuals gain through experience, and personal characteristics that go beyond 'well trained' but do not necessarily require brilliance. If part of this function is performed by a foreigner, then the assignment or periodic reassignment should extend over a substantial period of time. In any case, the cost of the research contribution is much larger than most of the training programmes contemplated when they were started, and more time is required than originally anticipated. Yet this function instils much of the ultimate quality of the programme, develops most of the relevance to domestic problems and, under present circumstances, produces a significant share of the total agricultural economic research output of the developing country.

Both in L.A. and in the U.S. some individual students receive good training and excellent research experience. However, for the average of the students reporting, deficiencies exist. Given the present national and international staff, the L.A. graduate programmes provide adequate teaching with limited choices among courses, more relevance to the home environment, while U.S. universities provide somewhat better courses, a wider choice, more competition but less relevance to the L.A. environment. The set of institutions that succeeds in improving the thesis and research function *for the L.A. student* should be the recipient of most of the master's candidates of the future. For the long run, research policy should be such as to

strengthen the ability of L.A. institutions to analyse their own problems. Some intellectual exchange, presumably at the Ph.D. level, should continue so as to combat inbreeding and parochialism.

The international funding of these graduate centres had been critical to their introduction. The transfer to national support probably will take much longer than originally contemplated. In view of the longer period and higher cost, it is suggested that provisions be made to mitigate the pressures for a number of new centres in other countries. This may be possible through special scholarships, consultation with professionals in neighbouring countries and their involvement in research problem identification and assistance in directing theses. Modest additional support for such functions can help postpone pressures for additional centres and consequent dispersal of funds in inefficient and less effective programmes.