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# Training in Agricultural Economics I

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Prospects for the future

*By* ALBERTO VALDÉS E.[1]
*and* JOHN L. DILLON[2]

# FARM MANAGEMENT AS A PROFESSIONAL DISCIPLINE IN SOUTH AMERICA

IS farm management in South America different, as a professional discipline, from farm management elsewhere? In one sense, of course, it can be no different. Just as on other continents, it is an applied science with its kitbag of internationally distributed principles, tools and jargon from economics, agricultural science, business administration and the cowshed. Where it does differ significantly is in the environment in which it has to work and in the problems it has to solve.

Through a variety of agencies and programmes, both inter- and intranational, assistance is being given to the development of farm management as a professional discipline in South America. Such assistance will be more efficacious the better it recognizes the special characteristics and problems of farm management in South America. With such an aim this paper explores, at least in summary fashion, some of the major problems confronting farm management in South America.[3] Our interest is in the professional discipline of farm management, i.e. in the specialist activities of those trained professionally in the analysis of economic and business management problems in the context of the farm firm. We are not directly concerned with the managerial role of farm operators nor, at the other end of the spectrum, with the work of agricultural economists having primary responsibilities in policy and marketing. While our working experience relates particularly to Chile, we believe that our appraisal is pertinent to all the countries of South America.

## I. *Background and productive structure of South American agriculture*

Over-all, the level of urbanization, standard of living, literacy, infrastructure and all the other prerequisites of modernizing agriculture

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are very heterogeneous among the nations of South America, but in general the levels are above those of most African or Asian nations. At the upper limit, Argentina and Uruguay are highly urbanized countries. They have serious production problems but no serious nutritional problems and no peasant agriculture. Venezuela and Chile are in an intermediate situation, with higher *per capita* incomes and a lower fraction of their population in agriculture than Brazil, Colombia, Ecuador, Paraguay and Peru. At the lower limit, Bolivia is a relatively poor agrarian state with a not insignificant subsistence element.

For South America as a whole, nearly half of the economically active population is in agriculture and its annual compound rate of growth from 1955 to 1960 was about 1·5 per cent compared to 4 per cent for its non-agricultural complement.[1] Currently, rural urban migration rates are relatively high, causing a stabilization or even a decline in the absolute number of active population in the rural sector of some countries.

Aggregate demand for food has been expanding rapidly in recent years, in several countries reaching a rate of 5 or more per cent per annum. This is the result of a high net population growth-rate combined with an intermediate income effect. By our calculations, based on a variety of alternative data sets,[2] only Argentina and Uruguay may have satisfied their implied demand increases for agricultural production over the period 1955–65, while the average deficit in production increase across all countries was about 40 per cent.

Some 70 per cent of agricultural production comes from commercial capitalistic farms. Subsistence-type peasant farming is limited mostly to marginal areas and only in a few regions—such as parts of the Andean Highlands—is it the dominant form of production. Even in Peru and Ecuador where subsistence farming is relatively more predominant, the importance of the subsistence sector in terms of agricultural production is negligible. Unfortunately, the same cannot be said of its role in the production of infant mortality, disease, illiteracy, misery, unfulfilled hopes, despair and the like.

Land distribution is skewed, varying in degree by country and

[1] M. Yudelman, *Agricultural Development in Latin America*, Washington: Inter-American Development Bank, 1966, p. 60.

[2] Data sources were: *Latin American Agricultural Development in the Next Decade: Report for Eighth Meeting of the Board of Governors*, Washington: Inter-American Development Bank, 1967; *Statistical Yearbook, 1966*, New York: United Nations, 1967; and M. Yudelman, op. cit.

region. Commercial farms typically operate on the basis of a heavy use of hired labour and generally have direct access to national and sometimes international markets. Purchased inputs represent an increasing fraction of total cost, for example currently reaching a level (our estimate) of around 35 per cent in Chile. Share cropping is of minor importance except for a few crops in some regions. Technological opportunities in production are widening fairly rapidly and managerial interest is increasingly orientated to movements on to new production functions rather than to marginal movements along existing production functions.

Small farmers, large in number but not in terms of their contribution to total output, typically lack political influence, sometimes suffer from monopolistic and monopsonistic exploitation and are usually not well integrated into the national markets. Indeed, there has been some discrimination against them, particularly in the credit market. In many regions they provide a reserve of labour for bigger farms and for urban employment.

The distinctive role of the manager (who may or may not be the owner) is clear in the medium to large-scale farm units. Generally he does not provide labour himself but concentrates on planning, execution and control—all of which may be no mean task if it includes, as is typically the case, managing a labour force of fifteen or more barely literate but increasingly organized and sometimes poorly motivated workers. Indeed, the practical operation of a farm with fifteen or more workers raises problems of labour management that go unrecognized in standard farm-management texts. The same applies to farm-accounting procedures. The specialist in accounting and business administration currently has much more to offer the manager of a large South American farm than the farm-management specialist trained via the typical family-farm orientated texts of United States origin. The treatment of inflation, internal transactions, complicated tax laws, labour and social security records, profit-sharing agreements, payments in kind, etc., demands a fairly elaborate system of managerial accounts, especially if—as is not infrequent—the firm produces as many as eight or ten different crops and hires labour under a variety of contractual arrangements.

In planning, both on government-sponsored and capitalistic farms, the extreme degree of uncertainty about institutions, policies, laws, labour relations, inflation and relative prices raises difficult problems with respect to long-term investment, credit, production programmes

and market possibilities; problems which are all very distant both from the subsistence farming model so common in the literature about development and from the simplistic diagrams of production economics.

Should South America keep its current land-tenure structure, a key question in modernizing agriculture would be the short supply of able farm managers or operators. Large-scale and diversified production via an uneducated labour force requires a very skilled manager who could easily obtain an executive position in commerce or industry. For such a person, rural living in a developing economy is usually not an attractive proposition. As a consequence, the urban sectors are probably getting more than an optimal share of the ablest people. Over the longer term, land reform could be a means of making the land market more fluid and contribute to adjusting the scale of farm units to a size more commensurate with the capacity of the farm managers that are really likely to be available to the agricultural sector.

## II. *Land reform and farm management*

In most of South American agriculture the present institutional and productive structure will not remain stable. The main institutional changes will originate with land reform. Except for Bolivia, which has already had a substantive land reform, and Argentina and Uruguay which have a low fraction of their population in agriculture, the discussion in other South American countries has shifted from arguments about the reasons and necessity for reform to the pragmatic issue of how best to do it, though of course there are still strong differences of opinion about what 'best' means. That it will occur appears inevitable.

The pressure for land reform can be found principally in social and political forces. Rural unrest is increasing and the issue of control over land is central to the discussion of agrarian problems.[1] Rural unrest, moreover, is continuously fed (and justly so) by the breaking of the traditional social equilibrium in the rural areas as a consequence of faster changes in values and aspirations compared to the level of economic and social mobility. In the main, land reform in South America is seen as necessary to change a rural structure based on

[1] See L. S. Shapley and M. Shubik, 'Ownership and the Production Function', *Quarterly Journal of Economics*, vol. 81 (February 1967), pp. 88–111.

hired labour on large private farms into a structure based on collective, co-operative or family-farm units in the hope of a consequent beneficial impact upon the general values and social integration of the national community.

Whether or not land reform is the best way of achieving these social goals is an open question from an economic point of view. Other approaches, such as government sponsored off-farm migration and work opportunities, might be better. There is insufficient economic research to judge. From a political point of view, however, the question appears to us to be no longer an open one; land reform has been chosen as the instrument to be used to break the institutional knot.

If land reform is going to be a reality in the next decade, what farm-management problems does it raise? For a start, assuming an orderly reform, there is the sheer mechanical problem of planning and execution; or if the reform is not an orderly one, of at some stage making order out of chaos. Both situations demand a heavy supply of down-to-earth farm-management expertise ranging from good agronomic sense to micro and macro budgeting with the poorest of data, to decision-making ability plus legal knowledge, and political savvy at both the grass root and tall poppy levels.

During the process of land reform, the need for farm expropriation (implying a real transfer of capital from the ex-owner to the State or to the beneficiaries of the land reform) makes present entrepreneurs feel very insecure in their farm occupancy, with consequent negative effects on the composition of their investments and probably on total agricultural investment. Given the risk of expropriation with only token or no compensation, the effective discount rate for investments on commercial farms is so high that few investments which require a relatively long gestation period would be able to give a positive present value of net benefits. Studies under way in Chile, for example, indicate that the present value of net benefits per irrigated hectare (using a 10 per cent discount rate) are three to four times their current commercial value. Thus, because of the risk of expropriation, there could be a substantial discrepancy between private and social net benefits—with resultant mis-allocation of resources. Should the process of land reform be a rapid one (which seems to be infeasible under a democratic or non-communist regime), this curtailment of rural investment would, of course, be only a transitory problem.

In a static situation, with negligible or very slow changes of tenure,

technology and marketing services, the returns to traditional farm-management research and services are probably not high. Under an effective land reform, the need for farm-management research, advisers and practice will be larger the bigger the changes that occur with respect to the decision-making process (collective, co-operative or family-farms) and the people involved in it, the scale and organization of production and marketing, the type of products grown and the changes in factor–product price ratios faced by new farmers.

Independent of the new tenure structure chosen, once effective land reform is in progress the need for farm-management advisers to help adjust to the new situation seems most urgent. The previous managers usually discontinue their prior occupation, moving to the agri-business or non-agricultural sectors and the country has to build, post-haste, an army of farm operators, supervisors and advisers whose size and structure will depend on the new forms of tenure. In the short run, a new land-tenure system that does not change the unit scale of operation too rapidly would probably be a good hedge against a decline in production as a consequence of a shortage of competent farm operators.

As a further hedge against the potential decline in output that might otherwise result from land reform, institutional changes which would tend to induce or force rapid technological change might be included as an integral component of the reform. Important topics of farm-management research would therefore seem to be the study of technical change in relation to tenure and farm size, in particular the role of co-operative or collective farms as instruments for technical change, and the choice between the use of labour or capital intensive techniques. Relative to the latter, one important topic would be to study the viability of every labour-intensive techniques when the supply of land is limited. Given the production function, the possibilities of raising the productivity of land by adding only labour could be quite low and a higher ratio of capital per hectare could be required.

Over the longer term, it seems likely (at least to us) that the more successfully land reform meets the current social and political needs that make it necessary, the greater the chance of a severe small-farm problem in ten, fifteen or twenty years' time. This is not to say the likely costs of reform outweigh the gains, but it does imply that farm-management specialists have a continuing role to play in enhancing the efficiency of land reform and in attempting to head off a reform-induced farm-income problem before it develops.

## III. *Economic development and the focus of farm management*

Measured against requirements the performance of South America's agricultural sector as a whole has been poor.[1] Overall, it seems that less capital and technical knowledge are in the hands of farmers than would be profitable. The extent of disequilibrium could be defined in terms of the difference between the present and the optimal level of resources devoted to agriculture, valued at their social cost. As Schultz has also suggested,[2] the thesis that we believe explains much of agriculture's lethargic performance in South America is that her factor and product markets suffer from severe distortions because of poor national planning, inept government policies and inadequate institutions. In other words, the main source of disequilibrium and the first one to resolve originates outside of agriculture. For this reason we believe a substantial change in the orientation of farm-management research is needed away from on-farm prescriptions to the provision of necessary data for the introduction of policies and institutions with a sound basis relative to both the technical and behavioural characteristics of agriculture.[3]

While it is true that the farm-management expert is not specifically equipped to deal directly with problems of policy, there is a great need for those who do take responsibility for policy to be adequately informed as to production possibilities, rotational requirements, feasible variations in factor proportions, attitudes to risk, etc., at the farm level. In providing such information, the farm-management expert has an important role to play. At the same time, farm-management research should be more strongly orientated towards producing data for the evaluation of public projects. The growing importance of public investment projects, often altering relative prices and investment opportunities, and the increasing measure of overall planning of the agricultural sector call for closer collaboration between specialists in farm management, agricultural policy, planning and project evaluation,

[1] See, for example, L. B. Fletcher and W. C. Merrill (eds.), *Latin American Agricultural Development and Policies*, International Studies in Economics, no. 8, Iowa State University, 1968; O. Braun and L. Joy, 'A Model of Economic Stagnation—A Case Study of the Argentine Economy', *Economic Journal*, vol. 78 (December 1968), pp. 868–87; and M. Yudelman, op. cit.

[2] T. W. Schultz, in reply to D. W. Adams, 'Resource Allocation in Traditional Agriculture', *Journal of Farm Economics*, vol. 49 (November 1967), pp. 933–5.

[3] In terms of our division of agricultural economists into 'farm-management specialists' and 'other agricultural economists', an alternative argument would be that the 'other' group should reorientate their activities more directly to the farm level. We believe the opportunity cost of such a change negates the argument

combining micro and macro methods of economic analysis. Such a role of liaising between farmers and policy analysts or planners does not correspond to the typical farm-directed view of farm management in South America.

What evidence do we have of the need for such a change in the focus of farm management in South America and in what sense is such a reorientation particularly relevant? First, there is an increasing flow of empirical research results[1] on product supply elasticities and price elasticities of demand for factors that suggest South American farmers do react purposefully to economic incentives. Second, a relatively high degree of government intervention exists in South American economies. The presence of very high rates of inflation, structural unemployment in some sectors, external economies and a highly skewed income distribution, together with not infrequent legacies of misguided action by prior governments, make the case for an active government role. As an unfortunate consequence, compounded also we believe by the effect of monopsonies and monopolies, the agricultural sector faces a series of distortions at the macro level. Probably most important are distortions in relative prices (including foreign exchange), the extremely high degree of economic and sometimes legal uncertainty and the rationing of credit.

In the product markets, price control of food has become a common feature in countries suffering from inflation. An overvalued currency is often associated with such controls, along with export quotas leading to the undervaluation of domestic agricultural production. On the factor markets some inputs are overpriced as a consequence of protective measures for local industry, and the supply of imported inputs is irregular because of changes in import restrictions as a consequence of balance-of-payments problems. Improvement in the internal terms of trade of agriculture is not the solution for all South America's problems of poverty and power structure, but it is an important component of a rational strategy aimed at promoting economic growth. Conversely, given the adverse terms of trade that it has typically had to face,[2] it is no surprise that agriculture's performance in South America has been lethargic.

[1] For example, see W. C. Merrill, 'Setting the Price for Peruvian Rice', *Journal of Farm Economics*, vol. 49 (May 1967), pp. 389–402; L. G. Reca, *La Producción Agropecuaria y los Precios en la Región Pampeana, 1924–1965*, Buenos Aires: Instituto Torcuato di Tella, 1968; and R. Yver, 'El Uso de Fertilizantes en la Agricultura Chilena', *Cuadernos de Economía*, No. 16 (Dec. 1968), Universidad Católica de Chile, pp. 51–61.

[2] The Argentinian case has been particularly well documented in L. G. Reca, op. cit.

The degree of uncertainty facing agriculture in South America is also typically far greater than could normally be expected as a consequence of internal supply fluctuations. The threat of land reform (on private farms) and the lack of clearly defined long-run price and commodity policies (on all farms) make long-run farm planning extremely subjective and undoubtedly deter private capital investment. In addition, they probably inhibit specialization with a consequent loss of efficiency. These effects, we believe, make the marginal value productivity of capital higher than its cost.

In the past, planners and policy makers in South America have failed to recognize or have ignored the adverse impact of their policies on agriculture and have shown a puzzling lack of interest about learning the reasons for farmers' failure to meet their hopes. By extending the implications of his research back to the policy formulators and analysts at the regional, national and sector levels, the farm-management specialist could very fruitfully contribute to closing the gap between plans and their implementation, with consequent important feedback effects on the formulation and efficacy of policy. As Schultz[1] and more recently Ruttan[2] and Schickele[3] have argued, farm management would contribute more fruitfully to economic development if, instead of limiting its normative focus to within the farm boundary, it also sought to help identify and rectify those factors beyond the farm gate which obstruct farmers' opportunities of serving the national interest. Such a need, moreover, is in no way mitigated by the implementation of land reform.

## IV. *The market for farm management specialists*

In many respects the market for farm-management specialists in South America is as yet neither well established nor well defined. Farm-management researchers—especially if they are conscious of the necessary link between micro and macro economic problems—should continue to face a forward-shifting demand, mainly from the government sector and especially for the planning and execution of land reform. Agribusiness is expanding in some countries, particularly in

[1] T. W. Schultz, 'The Theory of the Firm and Farm Management Research', *Journal of Farm Economics*, vol. 21 (August 1939), pp. 578–86.

[2] V. W. Ruttan, 'Issues in the Evolution of Production Economics', *Journal of Farm Economics*, vol. 49 (December 1967), pp. 1490–9.

[3] R. Schickele, 'Farm Management Research for Planning Agricultural Development', *Indian Journal of Agricultural Economics*, vol. 21 (April–June 1966), pp. 1–15.

Argentina, southern Brazil and to a lesser degree in Chile, and should become a source of employment for some small fraction of farm-management analysts whose employment by the private sector appears to work as a joint demand with the services of technical advisers.

What seems puzzling is the market for farm-management advisers. Given that there are virtually no government advisory services, why is it that farm-management advisory work has not become an established commercial profession? In North America, Australasia and parts of Europe, commercial managerial advisory services have developed despite the availability of free government services. But in most of South America, if a farmer wanted to hire the services of a management consultant he would have difficulty in finding one. In contrast, there is a fairly well-developed market for technical advisers specializing in agronomy, horticulture, oenology, veterinary science and the like.

Is this absence of commercial farm-management advisers a supply or a demand shortage? The lack of facilities for training such people has been common to both the technical and managerial fields. Had they wished, there would have been no difficulty for technical specialists to switch, at least in part, to managerial consulting. Our belief is that the cause of the differential market growth between technical and managerial services lies on the demand side. If this is so, what explains the lack of demand? The guess we would hazard is that the expected returns to purchased managerial advice are low relative to the returns from technical advice, and that in the highly uncertain environment that exists, the farmer feels he can guess economic optima just as well as a management consultant could. Too, given his widening technological opportunities, the interest of the farmer is probably centred more around shifting to new production functions rather than worrying too much about movements along the old functions. Whatever these underlying reasons may be, we believe the lack of demand for farm-management consultants is prima facie evidence that the provision of on-farm advice would be a relatively unproductive activity for farm-management specialists in South America at this stage. Their expertise would be better used if it were directed up to policy makers and planners rather than down to farmers.

## V. *Research priorities and problems*

South America needs farm-management research at two broad levels—one consisting of the routine servicing of planning and

operational requirements (especially in relation to land reform) for the implementation of policies that have already been promulgated by government, and the other consisting of the not so routine task of seeking and assessing alternatives for both current and future action.

Except to note that it is needed and demands professional know-how, little can be said of the first-mentioned service type of research. In a sense, it is an essential follow-on to the second or problem-orientated type of research. In this non-routine context we see farm-management researchers as having their major role in helping to close the gap between farmers and policy makers and planners. Their clientele would be primarily the public sector, whose influence is growing rapidly in both the factor and product markets. The major research problems implied by such a view, as we see them, have already been noted. Our priorities would run as follows: (1) Identification and assessment, at farm and regional levels, of the consequences of current and alternative public policies and institutions relative to the generation of uncertainty and such variables as production, technology, profitability, land use, employment, liquidity, etc. (2) The collation of relevant farm-level data for the evaluation of proposed public projects in irrigation, land settlement and subdivision, storage, processing, transportation, import substitution, etc., which have a direct impact upon agriculture. (3) On-going research relative to the planning and execution of land reform, especially in relation to alternative tenure and decision-making arrangements and farmers' attitudes to risk. (4) In co-operation with rural scientists as need be, the study of problems related to the development and adoption of new techniques and better-quality inputs.

Implicit in such research is a substantial requirement for both physical and financial data on farm performance that must be generated either through record-keeping services or sample surveys. In turn, such data requirements raise the question of co-ordination between agencies concerned with agriculture. Currently, as often evidenced by the existence of conflicting policies and secrecy about data, and despite an increasing measure of public planning for agriculture, there is a depressing lack of inter-agency co-ordination and co-operation. In part this is generated by the pervasive way in which politics enters every aspect of life in most South American countries.

As a result, too, of politics it is often difficult to pursue objective economic research. Results that are unfavourable to current policy tend to be interpreted as ideological criticism. In consequence,

researchers and their institutions are under continuous pressure to watch their image in terms of the work they do and, for institutions, the people they employ. In universities this poor situation is usually abetted by the extensive use of part-time professors and the concomitant lack of full career opportunities in university teaching and administration.

## VI. *Professional training*

So far as it is available, professional training in farm management in South America is given via the Ingeniero Agrónomo degree. This five-year course is currently the only legally recognized ticket to professional work in agriculture. There seems to be no hope of shortening the degree to four years. If well taught, the Ingeniero Agrónomo should graduate with a training more equivalent to a United States Master's than to a United States first degree in agriculture. As yet, however, this can only be said of graduates from a few universities. Most South American graduates are far weaker than their United States couterparts, largely due to the poor training and disinterest of many of their professors, the lack of adequate physical facilities and the old-style European pattern of university education that is still so frequent.

Within the Ingeniero Agrónomo degree, we believe full specialization in farm management might best involve a programme of studies along the lines shown in Table 1. Over a total of 10 semesters with four units per semester, this programme implies: 3 units (7·5%) of basic science, 8 units (20%) of rural science (plus field and laboratory work), 4 units (10%) of mathematics and statistics, 6 units (15%) of economics, 10 units (25%) of managerial courses (plus field and laboratory work), 3 units (7·5%) of macro agricultural economics, 2 units (5%) of sociology, and 4 units (10%) of thesis research and writing.

Obviously, with suitable adjustment, the course programme of Table 1 could be adapted for specialization in policy and marketing, or for a generalist training in agricultural economics. Certainly the proposed scheme differs substantially from current Ingeniero Agrónomo programmes which typically emphasize a generalist training and contain no more than 10 per cent of economics and farm management. First, only the first two or three semesters of the proposed programme are common for all students, so that specialization is possible after the second or third semester rather than after the fifth or

sixth. Second, it suggests no more than four courses per semester rather than the typical fragmentation into seven or more 'bitty' courses with all their problems of lack of depth, difficulties of co-ordination and compounding of prerequisites. Third, the proposed rural science courses of Plant Science I, II, III, and Animal Science I, II, III, constitute a self-contained sequence needing only the first semester subjects as prerequisites. In contrast, the usual Ingeniero

TABLE 1. *Suggested option for farm-management specialization within the Ingeniero Agrónomo degree programme*

| *Semester* | *Units* | | | |
|---|---|---|---|---|
| 1 | Introductory Agriculture | Physics | Chemistry | Biology |
| 2 | Plant Sci. I | Animal Sci. I | Math. I | Economics I (Introductory) |
| 3 | Plant Sci. II | Animal Sci. II | Stat. I | Farm Mgm't I (Introductory) |
| 4 | Plant Sci. III | Animal Sci. III | Math. II | Bus. Admin. I (Accounting I) |
| 5 | Bus. Admin. II (Accounting II) | Agricultural Engineering | Stat. II | Economics II (Price Theory I) |
| 6 | Bus. Admin. III (Costs) | Farm Mgm't II (Planning) | Dec'n Theory (Utility) | Economics III (Price Theory II) |
| 7 | Bus. Admin. IV (Finance) | Farm Mgm't III (Math. Methods) | Sociology I (Introductory) | Economics IV (Macro) |
| 8 | Agricultural Policy | Agricultural Marketing | Sociology II (Rural) | Economics V (Project Evalu'n) |
| 9 | Extension | Farm Mgm't IV (Seminar) | Agricultural Development | Economics VI (Opern's Res.) |
| 10 | Thesis | Thesis | Thesis | Thesis |

Agrónomo programme has so many rural science subjects (all laden with irrelevant and status-seeking prerequisites from the natural sciences) that it is impossible to achieve an adequate optional content of relevant courses for specialization in farm management. The same is true relative to specialization in agricultural policy, marketing and other social science fields. It is the old story of too much emphasis on soil, plants and animals rather than man as the prime element in agriculture.

Due to the demands of land reform and other government planning activities in agriculture, we would expect most farm-management graduates to be employed in government administration, planning and research. For this reason it is important that they receive some university training in the practicalities of planning and research and

the presentation of their results. Hence our suggestion of a final semester devoted solely to supervised research.

As already noted, with good teaching and an efficiently organized programme of study, the Ingeniero Agrónomo course should produce graduates equivalent to United States master's degree. In these terms there seems no reason to consider the development of graduate programmes for a master's in farm management. Over the longer term we hope this is true. In the short run, however, it is not the case. Current Ingeniero Agrónomo programmes are typically inadequate. One of the most efficient ways of fostering their improvement could be to provide master's programmes (largely based on advanced undergraduate courses) at the one or two South American universities which already have strong undergraduate programmes. Catering mainly for graduates from the more traditional curriculum, such programmes would provide an opportunity for upgrading the training of past graduates from both local and foreign institutions. Participants in such programmes would gain both a view of what can be done under a well-organized Ingeniero Agrónomo course and an appreciation of farm management in its specifically South American context. Only the former experience is possible with United States or other overseas training. At the same time the few South American universities providing master's training would be gaining experience for the eventual introduction of doctoral programmes, so continuing their role as academic growth centres for the continent. These comments, of course, are just as relevant for the whole field of agricultural economics or rural science as for farm management.

## VII. *Summary and conclusions*

In our view, farm management has a substantive South American dimension. The better this is appreciated, the more effective farm management will be in meeting the problems it confronts in South America. Most important among these problems are questions of compatability between farm fact and policy hope, social and institutional change, uncertainty, the planning and execution of land reform, the focus of farm-management research, and the training and employment of farm-management specialists.

The present institutional and productive structure of South American agriculture is quite unstable and will continue so for some time. Today, land reform is the main vehicle for institutional and social

change. As a short-run effect it is probably having an adverse impact on production. Over the longer run, land reform could be used to accelerate the adoption of new technology, but care will need to be taken to avoid the development of a reform-induced farm income problem.

Not least due to inept government policies, the current performance of South American agriculture as a whole is inadequate. The major implication for farm management is that there should be a substantial change in its orientation. Rather than concentrating solely on the provision of farm-level advice, farm-management specialists should actively liaise with planners and policy makers to ensure that policy and planning are compatible with farm reality.[1]

Land reform and other government activities will enhance the demand for farm-management specialists. However, despite the lack of free government services, there is as yet little demand from the private sector for commercial farm-management advisory services. This contrasts with the demand for technical advice and suggests that the returns to managerial advice are low relative to the returns from technical advice, at least under current conditions.

Over and above the need for greater routine servicing of government planning requirements (especially in relation to land reform), we feel South America particularly needs farm-management research in relation to: the provision of data needed for agricultural policy formulation; the evaluation of the farm-level effects of public development projects impinging on the agricultural sector; the assessment of alternative tenure and decision-making arrangements under land reform; and the introduction of new technology.

Finally, to cater for the training of farm-management specialists, provision should be made within the Ingeniero Agrónomo degree programme for an option emphasizing economics and management.

[1] Such a view implies both interesting contrasts and similarities with the critical views on farm management in the U.S.A., U.K. and Australia expressed by D. B. Williams, 'Production Economics, Farm Management and Extension', *American Journal of Agricultural Economics*, vol. 51 (February 1969), pp. 57–70.