INTERAMERICAN INSTITUTE FOR COOPERATION ON AGRICULTURE

PROGRAM II:TECHNOLOGY GENERATION AND TRANSFER

# MANAGEMENT BY OBJECTIVES AND AGRICULTURAL RESEARCH

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Seminar on Policy and Management of Agricultural Research

Port of Spain, Trinidad

February, 1988

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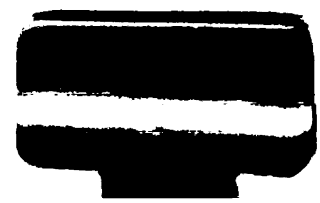

# MANAGEMENT BY OBJECTIVES AND AGRICULTURAL RESEARCH

By
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CONTENT PAGE

Let me begin by pointing out that I am not a management specialist or expert. My background is in economics and sociology with some training in what is known as complex or formal organizations. Therefore, my primary interest here lies not in the formal theory of Management by Objectives (MBO) but rather in the various social, economic and cultural conditions shaping the setting and dynamics for administrative and managerial change.

## The Case for Managerial Change

The present discussion should be seen as part of a broader concern. Improving research administration in Latin America and the Caribbean (LAC) is quickly becoming an urgent priority. The demand for better technology has spread as more and more areas of agricultural production enter the market economy and find themselves subject to competition. Not only the production of exportables but, increasingly, that of all kinds of crops and animal products require technical change. In the face of this, research administration has changed rather little and often to the worse. In a number of countries research organizations and activities have grown enormously in response to actual and perceived demands. For instance, INIPA in Ecuador and ICA in Colombia originally began working on 5-6 commodities in a few regions. Nowdays, the number is closer to 60. To these a much expanded number of regions and of disciplinary areas need to be added. Both money and scientists have increased but not proportionately to the growth in research fronts. This is tending to atomize research undermining its critical mass in a number of fields and countries. The widespread cry for priorities reflects tensions arising from this state of affairs. While such a broad picture does not apply to every research program or country, it holds in the main for a number of them.

Administrative complexity has also greatly increased,but within a basically traditional framework not substantially altered by the gradual incorporation of certain supporting technologies such as computers. The consequence has been a bogging down of research. Still, this only amounts to part of the story. I will mention some other problems in the sections dealing with difficulties and preconditions for MBO in research organizations. The point to be kept in mind throughout, however, concerns the net effect of all these problems. Some research programs are losing their effectiveness in terms of being able to help

the farmer. This in turn undermines support for research organizations and adds to the difficulties of modernizing agriculture. Again, the argument while overgeneralized applies to an increasing number of organizations and specific instances.

The case for the priority of management lies thus in the need for change and in that it appears to be the only point of leverage potentially tractable to inducing such change. As Peter Drucker has put it, management holds three major responsibilities: deciding the purpose and mission of the organization, making its work productive, and managing social impacts (Drucker,1973:4). While this may represent an overly sanguine view of possibilities effectively open to managers, very few alternative courses of action seem to be available.

## Traditional Management

Historically, the term management has been associated to the concept of administrating and organizing productive resources, including among these human labor. The term usually implied some purpose or goal--profit, an increasing patrimony or whatever--but with emphasis on the administration of resources. Precisely because of such an emphasis, in practice attention to resources and process could easily lead to the neglect of goals and purpose. Even in the best of cases it often failed to encourage deliberate concentration on effectiveness and efficiency.

Neglect of results was in practice far more prevalent in public than in private administration. Political and institutional factors have always weighed considerably, adding a number of extra dimensions to the task of the public manager, never guided solely by an efficiency criterion. Even in development administration where a different approach might be expected, studies have tended to emphasize increasing institutional strength and administrative reform rather than performance (White,1987:5).

## An Alternative Paradigm

Over the past decades a different paradigm has become widespread. Although originally deriving from earlier public sector experiences, private business circles adopted and developed it from where it has returned to the public sector. I refer here to management by objectives or

results.1 This describes an approach to work that focuses comprehensively and sytematically on end products or results rather than on intermediate processes or activities. According to its advocates , MBO represents more than a simple technique. It provides a totally different outlook on management: one that is comprehensively end or result oriented. The process begins with a global planning effort that starts at the top level with mission identification and selection (strategic planning) and goes from there downward to the lowest and most specific activities. As it proceeds, goals and objectives "cascade" down by levels in a consistently linked fashion. The highest level objectives provide overall goals for the organization. At each level down, objectives constitute means for achieving those higher up. As a distinguishing feature of this approach, objectives or results are specific and quantitative (or accompanied by quantitative indicators or measures) which provide fixed targets in time and space instead of vague statements. Success depends on this. MBO takes even routine aspects, not easily treated or defined as objectives, and quantifies them as minimun standards.

A central feature of MBO, the adjustment of reward systems, specially of bonuses and increases, to actual performance in achieving objectives, follows logically from the approach . Additional features, although not exclusive to MBO, involve programming, budgeting and detailed coordination all closely tied into ensuring results. Consequently, MBO requires good feedback and therefore good monitoring and evaluation arrangements. These are necessary both to adjust the system gradually to the nature of its specifics and to adjust rewards to performance.

Who establishes goals and objectives? First of all, at each managerial level those responsible make the final decisions by themselves. They do so, however, by taking objectives at the next level up as goals and incorporating participation and information from lower levels. It is not an arbitrary process since the end result must be an interrelated and linked network of objectives in which those at any given level contribute systematically to the achievement of those at the next level up.

1See,for example, Odiorne (1965;1979) and McConkey (1975;1983).

Contrary to popular belief, MBO advocates hold that the approach does not necessarily involve extensive paperwork and bureaucratic redtape. Rather, they argue that when such features are present they reflect symptoms of pathology. MBO does require a generalized acceptance as a methodology, within the organization. It demands prior preparation and a long period or phase (3 or more years) plus expert help. Two serious and common errors often involve trying to implement the system hastily or without expert help. Gradual incorporation from top levels down often represents the best way of introducing the system.

My impresion is that no Latin American public research organization has really introduced MBO. I cannot say anything in this regard about the Caribbean but my feeling is that perhaps the same conclusion might hold. Surely in Latin America there have been at least some attempts to move partially in this direction. They have derived, however, more from efforts to implement performance budgeting than from comprehensive reform initiatives and this has been their weakness. What little has been carried out seems to me to reflect changes more of a formal than of a substantive nature .

## Problems in Using MBO for Agricultural Research Management in Latin America and the Caribbean.

A number of difficulties arise when trying to fit MBO to public agricultural research organizations in Latin America. I turn now to these.

### Public Sector Restrictions

The conditions and operation of the public sector in LAC countries work against an indepth as opposed to a superficial implementation of MBO. Often, existing rules and regulations simply do not allow much room for allocating rewards on the basis of performance, a basic requirement in MBO. Similar considerations apply to possibilities of ending non productive activities and reallocating resources.

The instability of resource flows and other frequent changes affect MBO possibilities. The allocation process often proceeds through a series of incremental or supplementary budgets spread throughout a fiscal year, each one successively providing a limited amount of funds. This greatly complicates target setting . In addition to multiple budgeting, the actual flow of funds may be

additionally limited because of Treasury restrictions. In such cases having the budget may not necesarily involve the actual capability of spending the funds. Consequently, a research organization sometimes may end up receiving most of its funds in November or December when it can no longer either spend the monies or, if so, do it appropiately. Other examples would involve cutbacks instead of the gradual trickle down from successive budgets and Treasury allocations.

Other problems derive from the possibilities of politically motivated direct intervention or pressures which often are never entirely absent. About these I need not elaborate beyond pointing to their implications for any systematic planning and organization based on results. Finally, legal restrictions usually block structural reform (reorganization) of public entities from within. This means changes must proceed from without and through the legal and, therefore, political systems, that is, of the Ministries or of Congress. As change attempts proceed, political subsystems may reject, sidetrack, or else modify them arbitrarily.

Problems with the Institutes

An organizational problem for many research organizations derives from the overload of functions they have been assigned in a number of countries. Responsibilities for animal health and plant protection, input regulation and for rural development gave rise to multipurpose structures with very different outputs, interests,time frames, political demands, clientele and, consequently, different organizational core technologies.2 Since research and its effects usually involve a much longer time frame than the other functions they tend to come out on the short end of absolute and even relative priorities when these are considered jointly from a political perspective.

Within the institutes, power and privilege arrangements frequently oppose changes in organizational structure and management focusing on objectives. To cite only one example, the composition of scientists by predominant

2Organizational core technologies in the sense of distinct product/client groups, ie.,Hage and Finsterbusch (1987:14-15). Also, a particularly useful conceptual approach to the idea of organizational technology is that of Perrow (1967;1972:166-67).

disciplines and specialties--such as agronomy or veterinary medicine--frequently become an obstacle to any change that might undermine their hegemony.

Instability and turnover in high research management positions derives from the political nature of the public sector. Fully implementing and adjusting MBO in most non research organizations can take anywhere up to 3 or even more years--an essentially long term undertaking. Because of the substantial complexity of research as an activity, implementing MBO in research organizations might take even longer. The turnover in high management detracts from the commitments and continuity necessary to implement and adjust the system.

With MBO, planning assumes a major role. Although objective definition originates throughout the various levels of the organization, as a process it requires technical support capabilities. Planning offices at the institutes tend to be weak. Although in theory often entrusted with coordinating and guiding the planning process, in actual practice they tend to be unable to do this for a variety of reasons. Rather their real function often lies in establishing the formal linkage with the MOA for the sake of elaborating, presenting and monitoring the budget. This responsibility tends to absorb most of their time and energy.

Other problems involve the weaknesses of the planning team. Frequently, the Planning Office head lacks training in research planning. He or she is often a researcher temporarily in charge of the Office. Even when formally trained in planning, it is usually in economic or physical planning but not in that of research. Similar considerations apply to the information systems monitoring research projects and activities.

## The Nature of Research

Scientific research is a creative endeavor because the nature of the activity involves a committment to producing some form of novelty. While the degree of creativity and novelty actually varies widely among fields, kinds of research and researchers, each result, to be valuable, must be unique and different from others in at least a single respect. Uniqueness in turn entails that both work procedures and outcomes are uncertain and cannot be fully pre planned and routinized. Task uncertainty, therefore, is built into research as a structural characteristic

(Whitley,1984:119-20). Since research results are never entirely predictable, the activity, therefore, fits only partially into rigid frameworks of planning, programming and management designed essentially for achieving results through the application of routine and stable procedures.

Likewise, training for scientific research reflects the creative unpredictable side of the activity. Research is mostly learned through a combination of both study and modeling upon significant exemplars--i.e., professors and researchers--and the actual engaging in research (Kuhn, 1970). Trained creativity and research abilities are acquired through an extended process in which the scientist invests his own identity on the risk of failure.

An important consequence of the preceeding is that research, except for those instances that only involve replications or very minor changes, gives rise to creative tensions. Especially for the beginner, as yet unsure of his or her abilities to act and innovate, the tension may be considerable. With time and experience confidence tends to increase but until then, however, the researcher resists a close scrutiny of what she or he proposes to do. This provides one reason why the researcher tends to resist being drawn into a rigid planning and programming system.

Closely related to the above, traditions and values acquired by the researcher during his long university training, emphasize autonomy to determine topics, methods of research and the initial evaluation of results. This later becomes a basis for emphasizing and defending full autonomy in selecting what and how to do.

All professions seek to develop a core of restricted knowledge and to generate mechanisms for defending and increasing their autonomy to apply it. In this sense research is hardly unique. It is to the degree that the practitioner seeks to maintain or enhance not only a methodological autonomy but, in addition, the unrestricted selection of problems to work on. Conflicts may emerge here between the mission of research organizations and individual preferences. The tighter the degree of coupling between what the researcher actually does at his own level and the objectives of his organizational unit, the greater the possibilities of conflict. This poses a difficulty in rendering goals and objectives at the project level compatible with those at organizational and institutional levels, through management by objectives.

The specialized and complex nature of knowledge involved in research adds to this difficulty and reduces the number of persons qualified to evaluate its details. This means that a hierarchical superior may not always be qualified to evaluate directly his subordinates output. A peer review may be necessary. Knowledge complexity thus tends to introduce and enhance collegial and participatory elements in an otherwise straight chain of command.

On the other hand, the allocation mechanism may strengthen objectives. If the allocation process only responds to a formal and internal mechanism it will carry little weight in actual terms for implementing MBO. Additionally, reliance on a purely formal mechanism would intensify the risks of over organization and bureaucratic rigidity, always potential dangers in agricultural research organizations, according to Schultz (1988:3). However, if linked to broader controls, the decision process may be improved. This, might be done, for example, through including farmer representation in the decision processes that allocate resources to adaptive and applied research projects. Or by including representatives of broader scientific and technological communities in the case of more basic projects.

It would be a mistake simply to conclude that the need is for stricter controls in order to make the researcher do what others have decided. Certainly, the researcher's views need to be considered. Rather, the real conclusion lies in stressing the iterative nature that an MBO application will require in the context of agricultural research organizations.

Related to the above, Vernon Ruttan has always stressed a crucial point. The value of performing research on any given problem will depend on the balance between two major considerations:
--One,usefulness of results. What will be the benefits or value to society of the new knowledge or technology if the research effort is successful. This aspect relates mostly to the demand for research from the external environment. Often discussions by economists and non researchers tend to focus exclusively on this aspect.
--Two,the potential payoff of the field or problem. What are the chances of advancing knowledge or technology, provided that resources be allocated to it. The answer here will depend on a number of variables often neglected by nonresearchers such as the state of existing knowledge, its inherent opportunities, and

resources, conditions and comparative advantages in specific terms. This aspect stresses possibilities as viewed from the angle of supply of knowledge and results. I fully concur with Ruttan's judgement that

> many of the arguments about research resource allocations flounder on the failure of the participants to clearly recognize the distinction between these two questions and the differences in expertise and judgement that must be brought to bear on responding to them (1982:264).

A number of discussions in the United States by agricultural scientists and administrators give the impression of an unduly narrow focus on the second question while neglecting the issue of what benefits success in research might bring. On the other hand, many discussions by economists and social scientists in Latin America have tended to concentrate on the first question while entirely neglecting the second one. As a result they have failed to touch on the whole issue of comparative advantages in specific areas of research.

Such Latin American discussions often assess research possibilities mechanically, solely in terms of gross resources without further qualifications. Yet as mentioned, research is a non routine and creative activity so we might speak more properly of research capital. This is a catchword for a number of different things among which are expertise, originality and motivation. I suggest these elements determine much of the actual payoff from allocating funds to research. More comprehensively, the real value of the product to be obtained will depend on the interaction between the socioeconomic utility of solving a research problem, the opportunities arising from the state of knowledge on the subject, and the expertise,interests, motivation and originality of those actually engaged in the research. Therefore, it will make a big difference whether a management system--and the corresponding objectives it generates--facilitates such an interaction or on the other hand inhibits or impedes it. Summarily put, intangibles are important in research.

Proper consideration of the complexities involved would require paying attention, under the subject of motivation, to career requirements and interests of researchers. Modern scientific fields comprise a particular kind of organization of work that is structured around competition for reputations from national and international audiences (scientific communities). Researchers advance claims in this regard through producing and publicly submitting research

findings that contribute to collective goals (Whitley,1984:81). Research reporting takes place through a variety of both formal and informal channels. In basic science, the primary channel is the journal article. Basic scientists exchange information for recognition (Hagstrom,1965).

As one moves down the continuum from basic to applied science to purely technological concerns, the role of publication, as a social regulator and motivator of institutionalized behavior, decreases. This happens because purely applied concerns involve other audiences and interests than generalized reputations.3 Even so, all interest in general forms of knowledge communication need not disappear. Researchers may and often retain a side interest in reputation building for reasons other than achievement of scientific status. In a more general sense, publication and writing, as well as communication through other channels, endow researchers with achievement credentials which may then be used for negotiating better positions, interorganizational mobility, pay increases, more interesting opportunities, and other benefits within the activity.

The role of credential building and accumulation for personal career purposes while not unrecognized tends often, to be either neglected or downplayed. To the extent, however, that it does influence performance and interests it calls attention to the desirability of considering the nature of results and publication opportunities when assessing new research projects. I see nothing illegitimate or undesirable about such considerations unless, of course, they are allowed to sway by themselves alone, or unduly influence, projection selection. Rather they should be built into such a process and given a proper weighting.

Again this emphasizes the iterative nature a succesful MBO application to agricultural research organizations would require. Goal setting should proceed not only from considerations relating to a country's technological needs and farmers. Important as they are, they cover only part of the picture. The analysis should include the second question in the broad and specific senses I have mentioned. Even if each managerial and organizational level should ultimately be responsible for its own decisions, goal setting and information gathering will require moving up and

3For discussions on some of the differences between scientific and technological literature see Price (1972) and Allen (1984).

down the hierarchy several times. Only this can assure congruency betwen demands for technological solutions with the real and effective potential--both of interest and capabilities--to offer solutions.

## Managerial Ignorance

Another source of difficulty lies in that few LAC researchers have the appropriate knowledge and training for good research management (Nickel,1983;Marcovitch,1986:13-14). Usually, they move into leadership and managerial positions without much training for them. And between the two roles--those of the manager and the researcher--skills and capabilities often differ in unrecognized yet important ways.

Another side to this problem is the presence in the research institutes of managers trained for business or public sector administration but not specifically for research. This group tends to experience impatience with the irregular and uncertain nature of research and with the peculiar social psychology of those who engage in it. Often it shows up in a discontinuity of language and understanding between both groups which is not conducive to raising the productivity of management.

When managers coming from areas different to research are subject to the authority of those that do come from it, the result may be a degree of inefficiency. The opposite ,however, probably may be worse due to lack of understanding of the nature of research. A side effect of irregular public sector funding is to raise demands for controls which in turn tends to broaden the influence of administrators from other fields.

## Organizational Preconditions for Administrative Success

MBO is not a panacea. In the absence of appropriate organizational conditions, no solely managerial approach can provide answers to the problems of agricultural research. I will now address this subject in its two major components:relations with the environment and internal structure.

Outwardly, a distinguishing characteristic is growing complexity of relevant specific environments--and this will include not only the direct task environment. What the

organization does affects producers, consumers, marketing interests, input and factor suppliers, and alternative providers and diffusers of technology to mention only a few. On the other hand, the organization is affected by these and others such as universities, international centers and alternative research organizations.

Research results obtained from scarce public funding, affect increases of production and productivity, cost reductions for producers and consumers, quality of products and food, and income and welfare of producers among other things. These results are mostly indirect ones, depend on a number of other things, and, therefore, technology if it is to be useful, must fit into a broad context that includes other actors and variables conditioning its efficacy. If research is to be successful in this sense of broader impacts, some degreee of coordination with the context will be required. This,however, does not necessarily imply direct formal and explicit relationships. What may be left to the market and what to natural forces and what requires some direct management will be an open question in each case. With some components of the environment, the most crucial ones, the organization will require some degree of direct coordination through formal relations, representation or agreements. Others may be dealt with more indirectly.

The point here is that in the past a structural deficiency of management involved its lack of systematic consideration of all the environmental contexts relevant to its major impacts. Put differently, this context should be considered at least analytically in the sense of fitting it into a conceptual and empirical framework dealing with necessary interactions for ensuring the utility and benefits of research products. Organizations in the past have proceeded self centeredly mostly ignoring any formal analyses of such interactions. I would argue here that a proper identification of relevant environmental segments, of appropriate linkages with these, and of suitable mechanisms for doing so should constitute an important organizational concern because it can enhance probabilities of achieving objectives. Some of the difficulties currently experienced by agricultural research organizations in Latin America seem to derive from clienteles reacting against research organizations through considering them irrelevant and inefficient and withdrawing support and funding.

As a related second major point, the environment is undergoing rapid transformation and this creates risks and problems for research. Technological change plays an increasingly central role in production, both for internal as well as for external markets. As a consequence, the

number and diversity of those voicing technological demands rises constantly--whether related to crops or products, types of farmers, regions, etc. Resulting pressures are fragmenting and multiplying the efforts of some research organizations while at the same time, given their limited resources, capabilities grow very slowly, remain constant or even decrease. On the other hand, the economic crisis weakens the State, and undermines the economic position of public officials, among them the public sector agricultural researcher. The number of technology suppliers in the world constantly increases and so does communication among them with the implication that in the future the share any given country may contribute to the world stock of agricultural science and technology will decline progressively vis a vis that generated by the rest of the world and available through transfer. This implies that research organizations will increasingly need to expand their search and linkage capabilities for obtaining information and knowledge available elsewhere. The nature of technology in terms of its dynamic scientific base is rapidly accelerating with biotechnology, information, computer science and other areas such as robotics. Public research institutes, if they fail to take this into account and organize appropriately--even at the international level--run the risk of becoming marginal in the best of cases and irrelevant in the worst of them, insofar as they concentrate on technological tasks decreasingly central and dynamic.

Where does the preceeding lead to? Quite simply to the conclusion that managerial success with agricultural research will increasingly require paying greater attention to the definition, analysis and management of the mission--strategic planning--because of the importance of linkages and articulations with the environment that condition the whole administrative process of research. A viable and appropriate conception of mission for research will increase its chances of success and of winning a secure place for its development. Put otherwise, if organizations fail to do what is needed, no managerial system will insure success.

Consider now the issue of internal organizational structure. If the organizational structure fails to encourage the right kinds of research, this will undermine the potential effectiveness of planning. Goal multiplicity in many research organizations has this effect. Organizations, in addition to carying out research and part or all of technology transfer, are required to manage animal health and plant protection, input control, rural development, etc. Often this happens simply because these functions are perceived (quite correctly,indeed) as related to technology transfer. Such a view, however, ignores the necessary differentiation essential to effectiveness. Under

the imperative of having to address different kinds of issues and problems, with different time frames, rhythms and priorities, research will hardly be given the effort, time and necessary resources to encourage it and make it productive.

Closely related to the preceding, national organizations face increasing demands for technology, in some cases involving direct pressures on the authorities. Research efforts tend to become atomized in the effort to respond to different products, kinds of farmers and geographical areas. With dispersion, the risk of diminishing effectiveness increases. Controlling this process will imply priorities, but in addition to identifying and defending them it will be necessary to arrange for an institutional situation and climate encouraging organizations to stick by them.

The second point concerns the internal organizational model in that it must involve a design favoring the right kinds and amounts of research. Here I only wish to point out that organizations perform at least three different kinds or types of research in terms of the core technology they use. These are adaptive, applied and basic research. Most organizations will require some mixture of these for a number of reasons which I shall not elaborate here. A key and often insufficiently recognized point is that each kind of research answers best to an essentially different organizational model. Each involves different clients, approaches, time frames, incentives and controls. Because research organizations have failed to grasp this central fact they have tended to operate on the basis of a hybrid managerial model not particularly appropriate to any of the three kinds.

## Where Are We At?

The problem is more complex than it seems and has roots at several levels. It also needs to be examined through different perspectives--for example,sociology, political science, psychology, in addition to the more frequent and very important ones of managerial science, economic rationality and substantive agricultural sciences. As an important point, management problems in research probably will not prove entirely soluble in the absence of both proper external links and internal design. In other words, the problem does not only lie in managerial procedures but also in being able to have structures

favoring the good exercise of management. This means that although improvements are possible within the existing structure by themselves alone they most likely will have a limited impact.

It seems to me that the question of whether MBO is ultimately applicable to agricultural research remains open.I do not refer here to the pseudo attempts and vulgarizations of this approach that have become common to many organizations. These would appear more of a cosmetic than substantive nature. I am referring to the sytematic and indepth application of the approach--in other words, affording it an even break. Perhaps the difficulty originates from a paucity of success stories here--or of knowledge concerning them. My own conjecture would be that MBO holds a viable core but one that requires further adjustment or adaptation to the peculiar features of the activity as well as certain external preconditions.

MBO was developed and applied mostly in organizations with fairly routine and well known techniques and a clearcut chain of command.4 Task uncertainty, inherent to the innovative character of research, and the collegial nature of work evaluation tend to make its application difficult although by no means impossible. The need here clearly is for a system capable of incorporating uncertainty and broad involvement without sacrificing a focus on results. In other words, the challenge is to develop arrangements that are performance oriented yet also flexible and simple.

We require scientific and technical (MacRae,1987) communities engaged in discussing,evaluating and innovating the subject. This calls for making the subject relevant and attractive and for providing the forums necessary to this discussion. We also need controlled experiments on MBO accompanied by suitable monitoring and evaluation of their outcome. In this sense MBO resembles an agricultural technique. Once a general principle has been developed, it requires appropriate validation and adjustment to the specific context it will be used in.

The other point relating to possible and necessary action concerns higher levels of understanding and knowledge about MBO and all of the difficulties of managing and planning research. This will help improve the level of understanding of the problem. To be effective, however, such training will need to be widespread, not only at research managerial levels but more generally among

4Although see, for example, McConkey (1975).

researchers. At the very least it should help them improve the design of their projects from a managerial perspective; beyond that it will aid in training them for promotion to managerial responsibilities. And as I have stresed, it should raise the level of understanding and handling of the subject.

If the goal is to have a real effect, training should be a continous or recurring operation. It will require a substantial effort in preparing and diffusing suitable materials. One important consideration here will comprise providing access to a literature that tends to be widespread throughout a number of journals and other sources. Another aspect will involve preparing suitable materials with which to backup and sustain training at a number of levels.

A Short Commercial for IICA

The Interamerican Institute for Cooperation on Agriculture, through its Program II of Technology Generation and Transfer, works directly in the fields discussed above. On the basis of the mandate provided by IICA's Medium Term Plan for 1987-1991, Program II concentrates on promoting and backing activities among its memmbers for the following ends:
1-Improving the design of technological policy;
2-Strengthening the organization and management of national agricultural research and technology transfer systems;
3-Facilitating the international transfer of technology.;
4-Developing and strengthening training programs;
5-Helping in the search for research and technology transfer funding.

Within the above framework I only want to touch upon two projects in the Program that relate to the areas discused. Both are of a multinational nature.

Information and management of agricultural research. This projects seeks to raise levels of available scientific and technical information on policy, management, administration, planning, monitoring, and evaluation of research. In terms of activities for 1988 the project will develop a bibliographical data base in these areas. In addition, it will begin providing, on a quarterly basis, the following to an initial selection of key research personnelthroughout LAC:
Bibliography of interest in the past five years.
Content pages of recent and relevant journals.

Copies of one or two papers of particular interest each year.
Preparation and distribution of 'state of the art' reviews on selected relevant topics and problems.
Copy service for requested materials.

Training in Management of Agricultural Research in LAC. This project seeks to aid national agricultural research and technology transfer systems through training initiatives in research management and administration. Like the preceeding one it is funded through available internal resources. Activities for 1988 include the following:
--Preparing a training package on research management for use in seminars and workshops on the subject.
--Offering a course on research organization for 30 to 50 managers from Central American and Andean countries, at CATIE, and with the joint participation of ISNAR and PROCADI.
--Providing or aiding specific training in selected countries.

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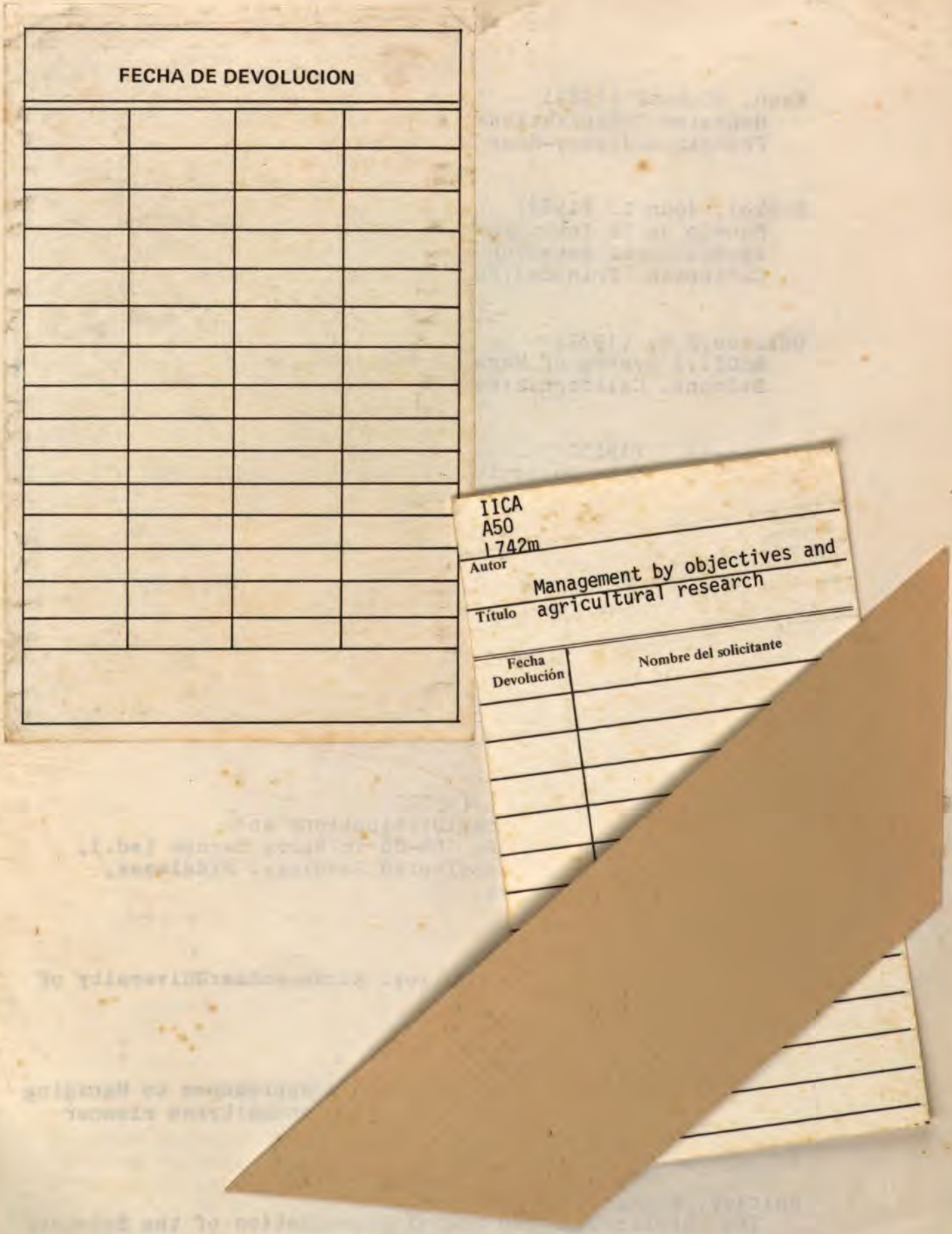
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