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*Evaluation
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Proceedings of a Workshop Held in
Singapore, 7-9 July 1986***

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Abstract

Interest in the potential role of evaluation in improving the management of research is growing. The use of evaluation, however, is probably one of the weakest areas of management at present. Although, there is a large body of literature on evaluation methodologies and the procedures for carrying out evaluation, little has been published on what evaluative information managers require and how this information can be most effectively gathered in a national research program. What resources should be devoted to ex ante assessment, monitoring, and ex post evaluations?

This workshop, held in Singapore on 7-9 July 1986, examined a number of case studies that document the present level of evaluation activities in different national programs and institutions. Participants used this case study material and their practical experience to reach consensus on some aspects relating to the different uses and users of evaluation, the role of evaluation in the planning process, and how to organize and implement an evaluation program in different types of research organizations. One session was devoted to reviewing the evaluation activities of external donor agencies. An alternative approach was suggested that would be more effective in the long run to both national programs and donor agencies. Areas of further collaboration between national programs related to training and impact studies were identified.

Résumé

On s'intéresse de plus en plus au rôle que pourrait jouer l'évaluation pour mieux gérer la recherche. Pourtant, l'évaluation est peut-être l'un des outils les plus négligés en gestion aujourd'hui. Bien qu'il existe une importante documentation sur les méthodes d'évaluation et sur les règles à suivre en la matière, peu d'auteurs ont abordé la question des besoins d'information des gestionnaires concernant l'évaluation, ni celle de savoir quel est le meilleur moyen de rassembler cette information au sein d'un programme de recherche national. Quelles ressources doivent être consacrées aux estimations, aux suivis et aux évaluations rétrospectives?

Un atelier, tenu à Singapour du 7 au 9 juillet 1986, s'est penché sur un certain nombre d'études de cas qui illustrent bien les activités d'évaluation qui ont cours dans les différents programmes et instituts nationaux. Les participants ont utilisé les informations rassemblées dans ces études de cas, y ajoutant leur propre expérience pratique, pour se mettre d'accord sur certains aspects tels que les différents objectifs de l'évaluation et ses divers usagers, le rôle de l'évaluation dans la planification, et la façon d'organiser et de mettre en place un programme d'évaluation dans divers types d'organismes de recherche. Étant donné que les agences subventionnaires étrangères sont à l'origine d'un grand nombre d'études d'évaluation, une session entière de l'atelier leur a été consacrée. On a suggéré une nouvelle approche, plus efficace à long terme, tant pour les programmes nationaux que pour les agences subventionnaires. On a aussi déterminé de nouveaux domaines de collaboration entre les programmes nationaux intéressés par la formation, d'une part, et les études d'impact, d'autre part.

Resumen

El interés en el papel potencial de la evaluación para mejorar la administración de la investigación, es creciente. Actualmente, sin embargo, el uso de la evaluación es una de las áreas más débiles de la administración. A pesar de que existe una literatura voluminosa sobre metodologías de evaluación y procedimientos para llevarla a cabo, poco se ha publicado sobre qué información evaluativa requieren los administradores o cuál es la manera más eficiente de recopilar esta información en un programa nacional de investigación. ¿Qué recursos deben dedicarse a las evaluaciones previas, a los controles y a las evaluaciones posteriores?

Este taller, celebrado en Singapur del 7 al 9 de julio de 1986, examinó una serie de estudios de caso que documentan el nivel actual de las actividades de evaluación en diferentes programas e instituciones nacionales. Los participantes aprovecharon este material de estudios de caso y sus experiencias prácticas para lograr consenso sobre algunos aspectos relacionados con los diferentes usos y usuarios de la evaluación, su papel en el proceso de planificación y la manera de organizar y ejecutar un programa de evaluación en diferentes tipos de organizaciones de investigación. En vista del alto número de evaluaciones que se comisionan, se dedicó una sesión a revisar las actividades evaluativas de los organismos donantes externos y se sugirió un enfoque alternativo que a la larga sería más efectivo tanto para los programas nacionales como para los organismos donantes. También se identificaron áreas para mayor colaboración entre los programas nacionales en relación con la capacitación y los estudios de impacto.

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Evaluation of Agricultural Research in Colombia

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Based principally on secondary sources of information and interviews, an analysis is made of the evaluation of agricultural research in the Instituto Colombiano Agropecuario (ICA) (Colombian Agricultural and Livestock Institute). To unify the management and analysis of information, some concepts and definitions used in the process of evaluation and its application are described. To facilitate the interpretation of research evaluation in the ICA as a factor of time and structural organization, a detailed description of the organization is given beginning in 1955 to the latest restructuring of ICA in 1984.

Evaluation of research in the ICA is discussed in the context of the national, sectoral, and institutional planning process, especially referring to evaluation when information permits. The validity of evaluation as an internal stage in the planning process in ICA has been closely linked to the institutionalization of planning in Colombia in 1958.

Although the evaluation function is explicit in the statutes and decrees of the institute, and much valuable work has been done on the subject, the degree of fulfillment is generally low for all areas with very few exceptions. The need to implement, apply, and institutionalize the planning execution process, however, especially at the evaluation stage, is shared by all decision-making levels in the ICA.

This report describes and analyzes the function of evaluation of agricultural research in the Instituto Colombiano Agropecuario (ICA) (Colombian Agricultural and Livestock Institute) and formulates recommendations to strengthen and institutionalize evaluation in the organization. The analysis covers concepts and definitions; classifications and typification of secondary information on evaluation; method and techniques employed; historical evolution of the ICA institutional model; national, sectoral, and institutional planning in Colombia; and the historic evolution of evaluation in the ICA.

The analysis of the evaluation function in the ICA is based principally on secondary sources of infor-

mation, interviews with executive personnel at different levels and with researchers, as well as the author's experience of 17 years in the ICA as researcher, national program director, research director, planning director, and, later, planning consultant. The criticisms, suggestions, and recommendations made by executives who read the methodological documents written at the end of 1984 and the first semester of 1985 were also taken into account. Also, to unify the management and analysis of information, some concepts and definitions used in the process of evaluation and the application of its techniques are given in the following.

Concepts and Definitions

In essence, evaluation measures, compares, and analyzes the coherence between results and specific objectives and between specific objectives and general objectives of institutional projects, programs, or plans. It also determines whether or not the general objective is being reached as well as its expected impact. According to the period covered, evaluation may be *ex ante*, progress evaluation, or *ex post*:

(a) *Ex ante evaluation* analyzes the internal and external consistency of plans, programs, and projects before they are carried out.

(b) *Progress evaluation*, with relation to what has been programed, measures the degree of use of resources and materials, the execution of activities, and the partial results reached.

(c) *Ex post evaluation*, according to its objectives, may be *ex post* evaluation of *results* or *ex post* evaluation of *impact*.

The types of evaluation and their techniques are grouped as follows:

(a) *Economic impact* measures the impact through cost-benefit relations and the internal rate of return.

(b) *Impact*. Effects attributable to the achievement of general objectives of plans, programs, and projects measured qualitatively or quantitatively by changes in variables such as production, productivity, income, costs, employment, nutrition, and product quality.

(c) *Basic*. Diagnosis and analysis of socioeconomic, biological, physical, technical, and institutional reality that will hopefully be improved through research activities.

(d) *Analytic*. Socioeconomic analysis of the limitations to change of activities and projects under way: adoption studies, productivity analysis, risk, use of labour, marketing credit, and prices and their effects on technological alternatives.

(e) *Operative*. Comparative analysis between materials and resources used, activities carried out, and results achieved — measures of efficiency.

(f) *Of Results.* Economic analysis of research results, retribution factors, and adoption probabilities. Comparative analysis of results and specific objectives obtained with respect to those programmed.

(g) *Traditional.* Uses traditional mechanisms and instruments for evaluation, such as reports, technical meetings, committees, and ad hoc groups for special purposes, courses, and seminars.

(h) *Personnel.* Performance evaluation of professional, administrative, and technical personnel.

Classification

There were 206 documents consulted for the 1962–86 period. ICA accounts for roughly 75% and the rest comes from 18 different agencies related to research activity in Colombia. Table 1 indicates the distribution of the evaluation studies by 4-year periods. A noticeable concentration is apparent in the post 1974 period.

With respect to the type of evaluations, the methodologies cover 26.7% of the documents consulted. Analytic evaluations, diagnoses or base evaluations, and evaluation of results follow in order of importance. Impact evaluation and economic impact evaluation jointly make up 11% of the documents. It is very probable that the information as to traditional evaluation is overestimated, as is the frequency of base evaluations. From the Department of Agricultural Research (DAR) to 1974 in ICA, progress reports by program, experimental centres and stations, and regional managers were frequent, but they gradually began to disappear by the date noted. Area diagnoses and specific-problem diagnoses have been numerous, but, unfortunately, there is no detailed inventory. This lack is covered, however, by the information on different types of evaluation (Table 2).

Institutional Model

To facilitate the interpretation of research evaluation in the ICA, as a factor of time, an analysis was made of the evolution of research activity organization as part of the overall structure of the Institute, beginning with the DAR from 1955 to 1962 to the latest restructuring of ICA in May 1984 (Fig. 1). In the years between 1879 and 1915, some efforts were made in Colombia to create the capacity for agricultural research. Its institutionalization, however, began with the creation of the DAR (1955–62) as a department of the Ministry of Agriculture with the specific function of carrying out research in eight products and seven support disciplines, which operated as national programs.

Table 1. Number of documents consulted on evaluation of agricultural research, 1962–86.^a

Period ^b	Number	Percentage
1962–65	—	—
1966–69	1	0.5
1970–73	20	10.6
1974–77	58	30.9
1978–82 ^c	49	26.1
1983–86	60	31.9
Total	188	100.0

^a Does not include 18 undated documents.

^b The intervals roughly coincide with presidential periods.

^c Data presented for a 5-year period.

Table 2. Bibliography consulted by type of evaluation, 1962–86.^a

Type of evaluation	Times cited	
Economic impact	12	(5.8) ^b
Impact	11	(5.3)
Base	26	(12.6)
Analytic	32	(15.5)
Operative	3	(1.5)
Results	21	(10.3)
Personnel	7	(3.4)
Traditional	12	(5.8)
Methodologies	55	(26.7)
Others	27	(13.1)
Total	206	(100.0)

^a Normative or descriptive documents but with reference to the function of evaluation.

^b Figures within parentheses are percentages.

From the creation of the ICA in 1963 to the present, the Institute has had four reorganizations. The initial model integrated the activities of research, education, and extension. The Research Division was made up of the departments of agronomy, animal sciences, agricultural economics, social sciences, and agricultural engineering, and these included the national programs. The activities of planning and administration were kept as support and consulting units. In comparison with the DAR, the hierarchy at the national level added a department, and the stations and centres are maintained at the national level. Although activities, thematic areas, and regional coverage are widened, research activity is the essential function.

In 1968, extensive modifications took place in the agricultural sector. The Ministry of Agriculture maintained its basic functions of direction, policy formulation, programing, and evaluation. The ICA became administratively and financially decentralized. As divisions of the assistant manager for technical affairs, the activities of research, education, and extension were maintained. The activity of rural development and the functions of supervision and control of materials, promotion, seed certification, and super-

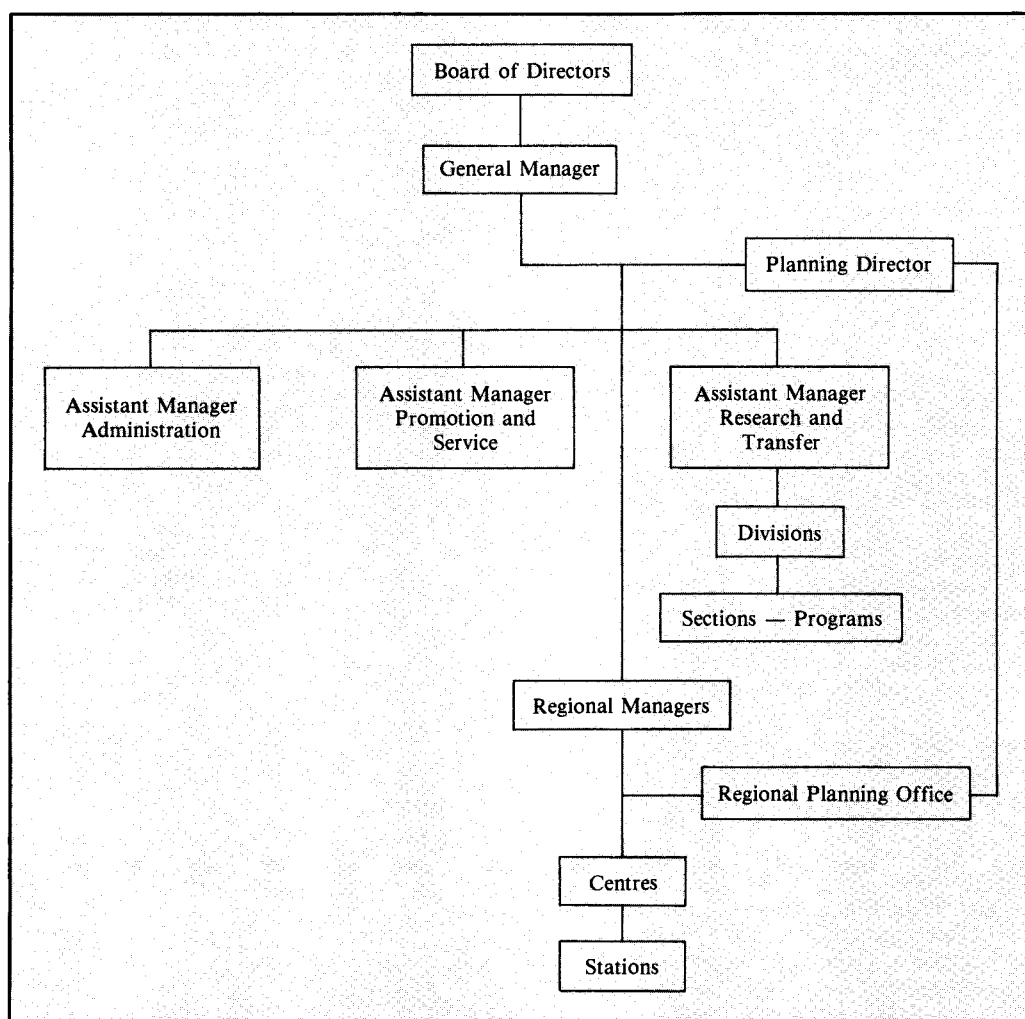


Fig. 1. Organizational structure of the Instituto Colombiano Agropecuario (ICA), 1984.

vision of technical assistance were added. The ICA received equipment and personnel from the Institute for the Promotion of Cotton, the Institute for the Promotion of Tobacco, and the Zooprophyllactic Institute. In the Research Division, the Department of Social Sciences disappears and the national programs for cotton and tobacco are added. Operative activities are promoted to the level of assistant manager, as a line unit from the general management. The Institute is decentralized into nine regional offices, and the centres and stations are maintained. With the creation of the assistant managers and regional managers, one level of decision is added at both the national and the regional levels.

In 1973, the position of assistant manager for technical affairs disappeared, but the activities of

agricultural and livestock production were added at the level of assistant managers. Research activity was also promoted to the level of assistant manager made up by the divisions of agricultural research, livestock research, agricultural economics, rural sociology, and education. At the regional level, regional directorships were created for each assistant manager at the national level.

In the 1981 restructuring activities, the activities in the areas of social sciences and agricultural economics that belonged to the assistant manager for research passed to the assistant manager for rural development and the divisions are more clearly specified. In 1984, the functions of the assistant managers for agricultural production, livestock production, and rural development are grouped under

the assistant manager for promotion and services. The activity of transfer is integrated into the research activity of the assistant manager for research and agricultural transfer. Now, the assistant manager for research has 9 divisions and 42 national programs (sections–programs in Fig. 1), in addition to the Coordinating Office for ICA and the International Bank for Reconstruction and Development (IBRD).

Planning in Colombia

Evaluation as a stage in the planning process is intimately linked to the institutionalization of the process in Colombia, which began in 1958, with the creation of the National Council for Economic Policy and Planning, and the Administrative Department of Planning and Services. In the same year, a mandate was given to organize planning offices in the agencies in charge of preparing partial investment plans, studying the order and routine of public investments, and reviewing and coordinating the projects of the agencies themselves. With the 1968 restructuring, the offices for economic policy and planning already mentioned were named the National Council for Social and Economic Policy (NCSEP) and the National Planning Department (NPD). In 1969, planning offices were created in all decentralized institutes.

By decree, NCSEP must study and make recommendations to the government and the development plans and programs presented by the NPD are to be submitted to Congress. For its part, the NPD must develop the norms for presentation and preparation of plans, programs, and projects that must be followed by the planning offices in the ministries, administrative departments, and other public agencies; assist those offices; develop and coordinate general development plans and projects, as well as *evaluate the results and implementation of those plans and projects*, proposing appropriate adjustments and modifications; and *evaluate the plans and programs* presented by the ministries, administrative departments, and other decentralized agencies.

In the NPD, the Technical Unit for Industrial and Agricultural Studies prepares the basic studies for the formulation of plans, programs, and policies for industry and agriculture, in close cooperation with the ministries of development and agriculture. It also must cooperate with public agencies in the evaluation of national and foreign private investment projects that require government intervention. Again according to decree, the evaluation of specific projects and requests for foreign loans must be undertaken by the Unit for Specific Projects and Foreign Credit.

The Division of Agricultural Production, created in the 1974 reorganization has, among other functions, the role of *evaluating the development of public and*

private activity in the area of agricultural production, in agreement with existing policies, to determine its effectiveness and to propose necessary adjustments. It also studies and *evaluates the production programs* proposed by the Ministry of Agriculture and studies their inclusion, if that be the case, into the investment budget for the agencies of the sector.

In 1982, the Normative Planning Law was passed. It defines the norms for diverse economic and social efforts in the formulation of development plans, and the procedures used to elaborate the national economic and social development plan. Planning in the ICA was institutionalized in 1969. The Planning Office, however, is not the only unit in the ICA responsible for planning. The various units undertake planning that is specifically related to their work area. For institutional evaluation, responsibilities are dispersed throughout the different units in the ICA (Table 3).

Planning Process

National Level

The process of national planning began with the measurement and evaluation of the implementation and results of public and private investment programs. With this information, policies and criteria for the elaboration of plans and programs are reformulated. Next follows the coordination stage, promotion, and instrumentation of direct planning of the public sector, through which government policies and the scope of its objectives are made operational, using sources of financing as an instrument.

The plans of the private sector, together with those of public investment, including public and private spending, once executed, lead to the reinitiation of the measurement and evaluation of implementation and results once again. The ICA participates in the national planning process, making its own part of the national planning system.

Sectoral and Institutional Level

For its presentation to Congress, the NCSEP recommends policies, plans, and programs for social development and the amount of public investment to the government, all of which has previously been defined and evaluated by the NPD. The Ministry of Agriculture, through its Planning Office for the Agricultural Sector (POAS), internalizes the national policies and, in close collaboration with the NPD, determines the sectoral policies, coordinates and *evaluates the execution of specific programs and projects* for the sector, proposing the necessary readjustments. *The evaluation of the results of implementation of plans and programs* for sectoral devel-

Table 3. Object or goal of evaluation for the Instituto Colombiano Agropecuario (ICA) according to statutes and decree 1114, May 1984.

Area	Object or goal of evaluation
Manager's Advisory Committee	Policies, plans, and programs for achievement of objectives
Planning Office	Scope of activities in the agricultural sector (impact of projects and foreign loan activities)
Office of Education and Training	Training programs
Secretary General	Methods and systems for rationalizing work and improving efficiency of the Institute
Office for Organization and Operational Control	Programs and objectives proposed for administration
Assistant Manager for Agricultural Transfer	Technological limitations and production factors by species and ecological zones, research projects, and activities of respective areas
Coordinating Office for ICA/International Bank for Reconstruction and Development (IBRD) project	Calendars for physical and financial investment, personnel hiring and training, contacts with consultants, and technical and financial development of the project
Divisions	Plans and programs for each division and in depth for some divisions
Technical Support Division	Socioeconomic component of research projects and their results, and economic impact of activities of the area of respective assistant manager, analyzing results and effects on national, regional, and local agricultural development
Livestock Disciplines Division	Production and health limitation by species and ecological area
Centres and Stations Division	Commercial demonstration projects
Assistant Manager for Promotion and Services	Activities, programs, and projects corresponding to the area
Coordinating Office for ICA/United States Department of Agriculture (USDA) program	Activities and technical and administrative results of the program
Divisions	Plans and programs of each division, in depth for some divisions
Division of Agricultural Materials and Resources	Programs of the National Laboratory for Agricultural Materials and Resources
Department of Vegetable Sanitation	Programs in the diagnostic centres and centres for insect and micro-organisms reproduction; vegetable sanitation agreements
Division for Peasant Development	Programing, information, and evaluation system for different peasant development programs (orients design)
Dissemination Division	Communication activities
Assistant Manager for Administration	Techniques and procedures for financial administration and control and finance
Divisions	Plans and programs of each division, in depth for some divisions
Personnel Division	Personnel performance
Division of Commercial Production	Commercial demonstration projects

opment and the proposal of necessary adjustments and modifications is the responsibility of the NPD.

The Director of the ICA with the support of the Planning Office, internalizes the sectoral policies, determines measures, assigns responsibilities and establishes objectives and strategies with other areas of the Institute, and carries out specific activities. The Planning Office is responsible for the activities of national diagnosis and planning. With other areas of the Institute, it develops institutional plans, the 4-year investment plan, and the annual budget project. It coordinates the executing of planning activities with ICA's technical areas and with the offices in charge of the planning process in other public and private agencies. It designs methods for the definition of priorities, follow-up and evaluation of plans and programs, and the coordination of their applications; *evaluates the impact of the Institute's activities in the sector*; and coordinates the programing and evaluation of projects resulting from loans, agreements, and contracts for technical assistance.

In practice, the process operates fundamentally as a mechanism for assigning resources, in large part because of the absence of long-term national and sectoral plans, whose discussion and approval was not defined by the Planning Law. This situation makes it difficult to identify and define the goals of the government in a framework of political consensus. As a result, it is difficult for the ICA to identify long-term objectives, which are part of the activities of research. In the short term, government priorities are frequently changed, making it difficult to assign and organize resources. Beyond the stage of annual budget making and the formulation of the 4-year investment plan, the other planning stages are not uniformly carried out in a methodical and systematic way. Under these conditions, the management of the planning-implementation process becomes difficult, affecting the Institute's efficiency and effectiveness.

Evolution of Evaluation

Given the difficulties of analyzing evaluation separately from the other stages of the planning process, the historical evolution of the entire process will be discussed, specifically referring to evaluation when the information permits. Secondary information will be used from three basic studies done in the ICA (Isaza et al. 1979; ICA 1980; Alarcón 1984), in addition to the documentation analyzed.

To 1978

The organization of the consulting structure for programing and evaluation is considered weak. The lack of a planning system adds to slowness in the flow of information; difficulty in promoting, moni-

toring, and evaluating local activities; centralization in planning and direction; decentralization in technical activities, with little delegation for coordination and evaluation at the level of implementation; lack of an institutional plan; and an excessive number of functions, which makes the evaluation of the achievement of objectives difficult. On those occasions when evaluation and control of technical activities does take place, it is done by those who carry out the activities; administrative control is done on finished activities.

On considering the degree to which the Planning Office carries out its functions, the evaluation of institutional impact was considered low, the design and application of follow-up and evaluation systems was fair to poor, and the coordination and evaluation of the programing and execution of projects financed with foreign funds was satisfactory. The degree of achievement of its other functions was considered to be from medium to high. The possible causes of the poor grades received by the Planning Office were the complexity of the tasks assigned; low budget; inefficient flow of information and its systematization, fractioning, and possible duplication of planning activities in other offices; and, finally, the frequent changes in the organization of the Office.

The degree to which evaluation functions are carried out — those corresponding to the office of the assistant manager for research — (Table 3) was graded as low for the divisions of agronomy, agricultural engineering and biometrics, discipline director's offices, coordinators, and other research professionals, and medium for the crop coordinators. In the office of the assistant manager for livestock production, the degree to which the Planning Office carried out its duties was considered to be high; medium to high was the grade assigned by the Division of Socioeconomic Studies.

Of the 148 ICA publications evaluated, 58% of them were written during this period, as were 100% of those on economic impact and operative evaluation, and 79.3% of those on analytic evaluation (Table 4). Ten of the eleven evaluations of economic impact, and most of those of analytic evaluation, were MS thesis papers from the graduate school, directed by professionals from the Agricultural Economy Department. Beginning in 1974, ICA's budgetary problems increased, which motivated the preparation of the documents on operative and impact evaluation.

To 1980

The limitations and problems mentioned in the previous period continue. The interpretation of sectoral policies, objectives, goals, and strategies is not carried out coherently and systematically. This activity is made more difficult by the lack of concrete national policies relative to the ICA's activities in

the agricultural sector. As instruments for interpretation, meetings and special studies are used.

The determination of the real demand for alternative technologies and services is done without any systematic unifying of criteria by meetings with farmers, mass media, individual requests by farmers or their associations, and, in many cases, simply as a result of the researchers' decisions. Some base studies, however, are made at the local and regional levels and evaluate the situation of farmers in specific areas or of producers of specific crops.

The evaluation of the technical, economic, and social reality, as well as the analysis of the institutional model, takes place sporadically as a result of circumstance and with no global framework. It is necessary to point out that the activities carried out in this area have been numerous and involve specific procedures and methodologies.

The 4-year investment plan is maintained as an orientation mechanism for the medium term. As for short-term orientation mechanisms, the Research Divisions and the DRI districts prepared documents that are somewhat similar to year-long working plans because they point out activities to be concluded. The budget manual is still used, and this program includes yearly and future budgeting activities. The information obtained from this instrument is difficult to manage.

ICA's follow-up and evaluation mechanisms refer mainly to the yearly progress reports and to other types of reports whose periodicity and coverage has been quite variable, although they are complemented by meetings, visits, and special reports of results. This type of evaluation simply consists of a list of activities implemented and their operative problems, with little reference to what was initially programmed and the expected impact. When significant results are obtained, their possible effects on the country's development are estimated. Ex ante evaluation of research activities has been a permanent activity of the Project Review Committee.

Aggregate evaluation of the ICA's activities has been quite irregular. The Planning Office, for 2 years in a row, determined the degree to which proposed goals were met, diagnosed the main problems, and, in some cases, described the causes for the differences between what was planned and what was implemented. The ex ante evaluation of the ICA-IDB project was carried out at this time, as well as sporadic ex post evaluation. These activities gradually disappeared, mainly because of a lack of human resources.

To 1984

To date, the guidance of the planning process is still considered difficult, primarily because of the magnitude and heterogeneity of the functions of the government. This difficulty is accentuated in follow-up and evaluation activities. This year, the critical institutional levels for the stages and activities of planning were evaluated. The main empty spots in the steps of this process were, in order of importance, follow-up and evaluation, instrumentation of execution, and a lower degree of programming. Out of a total of 12 activities, it was considered that the following should be reinforced: (a) definition of a guiding institutional framework; (b) evaluation of the institution, policy, and implementation procedures review; (c) proposals for corrective measures; (d) information collection and analysis for follow-up activities; and (e) measurement of achievement and impact. If the follow-up and evaluation stage is considered separately, the weakest activities were institutional evaluation and institutional policy evaluation and review.

If these results are compared with those obtained in studies done in 1979 and 1981, the behaviour of planning activities, and especially of the function of evaluation, can be considered the same. Two very important goals in this period were the formulation of the National Plan for Agricultural Research (NPAR) and the base studies for the formulation

Table 4. Number of documents about the function of evaluation written at the Instituto Colombiano Agropecuario from 1966 to 1986.^a

Evaluation	1966-78	1979-80	1981-83	1984-86	Total
Economic impact	11	—	—	—	11
Impact	8	—	1	—	9
Base	10	2	5	9	26
Analytic	23	1	5	—	29
Operative	3	—	—	—	3
Results	8	2	10	—	20
Personnel	2	—	1	1	4
Traditional	3	2	—	6	11
Methodologies	19	3	—	13	35
Total	87	10	22	29	148

^a Does not include four undated methodology documents and two normative documents.

of the National Plan for Agricultural Transfer (NPAT).

To March 1986

In the first semester of 1984, the ICA-IBRD project was approved on the conviction that it would strengthen research activities in priority crops and experimental centres. As part of the component of technical cooperation, the evaluation function, considered critical by ICA, would also be strengthened. Before treating the evaluation function separately, it was considered convenient to analyze planning as a whole, given the relations and interactions of the different stages of the process, and their interrelations with exogenous variables. As a strategy for action, the elaboration of a series of methodological and conceptual documents was agreed upon, which as a first approximation to the study, and as working documents, would analyze and systemize ICA's experience (Table 4). Before beginning the study, the objectives and scope were presented at a meeting of the committee with the office of the assistant manager for research, made up of the division directors.

Once elaborated, the instruments would be discussed in a technical meeting, in addition to the individual or group analysis that would be made of each particular document. The recommendations and adjustments resulting from the evaluations would be used in the development of the final instruments, which would form the planning system. As an intermediate step, the instruments would be applied and evaluated in one or two regions (horizontal instrumentation) and in one or two divisions (vertical implementation). The final stage would be the implementation of the system in the entire Institute. The participating directors implemented the system up to the document analysis stage. For the period, a synthesis of the concept of the system and each of the instruments developed will be made and suggestions and recommendations will be given.

General Problem

Globally, horizontal and vertical disarticulation exists between the planning and the execution of activities and, therefore, among planners, administrators, and executive personnel at the national, regional, and local levels. The disarticulation is made more serious by a strong tendency to strengthen the central office at the expense of other areas of the Institute, because centralized and unidirectional decisions — from the top down — are made, and there is little or no participation by the Institute's target population. The plans and programs developed are somewhat isolated from political, social, and economic reality. Finally, to modernize fiscal control

and the administration of resources, too much emphasis is placed on the use of financial techniques.

Proposal

To counteract the problem and that of previous periods, a planning-execution process is conceived as a sole, continuous process, made up of the stages of *formulation, implementation, execution of activities, and control evaluation* in which the local level is integrated with the regional level, and the regional level with the national level. This propitiates the real participation of farmers, change agents, the scientific community, and policymakers.

The Institute is an open system made up of three subsystems: (a) the *production* system, which transforms resources into final products; (b) the *support* system, which establishes norms of interaction between the subordinate systems and their components with the overall institutional system, as well as establishing the nature of its relationship with the environment; and (c) the *directive* system, which directs and guides the activities of all the other systems. The planning-execution process includes all of the systems at the national, regional, and local levels, however, the direction and guidance of the process is the responsibility of the directive system.

The directive system is made up of two subsystems, the *planning* system and the *decision* system, and has the following functions: directing the subordinate systems, permanently interpreting the problems of agricultural research and transfer, defining institutional policy, implementing the organization adopted or the changes suggested, coordinating the action of different components and elements of the Institute, carrying out the execution of specific activities, and controlling and evaluating results. The overall action strategy would be oriented toward strengthening the directive system and its mechanisms to achieve the necessary articulation between agricultural generation and transfer in the different administrative and thematic levels of the ICA and between the Institute and agencies in the public sector and the national, subregional, and international system for science and technology, as well as the organization of activities in the private sector.

Process of Policy Analysis

For the direction and guidance of the planning-execution process, the directive system needs long- and medium-term decisions as to orientation and operative decisions in the short term. To carry this out, the decision system requires permanent advice from the planning system through a process of policy analysis. The orientation decisions are considered at three policy levels: doctrine or philosophical framework (long-term plans), orientation framework

framework (medium-term plans and programs), and specific policies (projects). The operative decisions are considered at two policy levels: policy measures (operative plans/programs) and specific activities (sections of projects).

The philosophic framework represents the most general-level policies of the Institute, its long-term objective image, and the final vision of the organization and operation of the Institute. It expresses institutional principles, what the Institute represents to the agricultural sector, the guiding framework of priorities, what it hopes to achieve, and the overall strategies to be followed to achieve its objectives.

The orienting framework defines objectives that can be reached in the time period corresponding to a single presidential administration and the strategies necessary to achieve those objectives. It is developed on the basis of the philosophical framework, the technological diagnosis of the agricultural sector, and the overall performance of the ICA. It will be updated, together with the three components mentioned previously, with the information resulting from the evaluation.

The level of specific policies defines specific problems (put in terms of projects) on whose solutions the ICA will concentrate its activities. To do this, interdisciplinary group work is required, as is deep knowledge of the problems in specific areas and the ICA's performance in those areas. The projects, as well as the ICA's performance and activities, will be permanently adjusted as the result of evaluation.

The level of policy measures defines the criteria for the assignment of resources and the organization of the private and public sectors. At this level, definition will take into account specific policies and problems, by areas of activity, and the ICA's performance and that of the agencies participating in the execution of programs and projects in those areas, as well as the results of evaluation.

The specific activities refer to the results that are expected in the period corresponding to one budget exercise and, in particular, aspects of projects and programs. At this level, existing policy measures, the performances of agencies involved, and the results of evaluation are taken into account.

A first step in the implementation of the process is the development of the general lines for the adjustments in the existing philosophical and orienting frameworks. The office of the assistant manager for research prepared the philosophic framework and the divisions prepared their orienting frameworks. This first attempt was submitted to the consideration of the advisory council of the office of the assistant manager for research, and to the advisory councils of the division directors, the regional managers, and the regional section chiefs. The regional level presented its criticisms and suggestions in writing.

Project Identification and Formulation: Conceptualization

Part of the implementation of policy analysis was the design of a single instrument for the preparation of ICA projects, which will include the procedures and methods that the Institute has been using. This is done to adapt it to the planning system to be implemented, to the redefined indicators that will measure the scope of objectives and goals in space and time, and the execution of activities and utilization of resources. The normativity of this instrument would be essential to facilitate follow-up and evaluation.

A proposal has been developed for the function of follow-up and evaluation. Taking into account the present organization, an information flow, and instruments to operationalize the functions of follow-up and evaluation, and those responsible, articulated at the local, regional, and national level, has been proposed.

Evaluation System for Economic Impact

The proposal sought to create a mechanism for evaluating the economic impact of ICA research. It would generate periodic, cumulative, and systematic information on the economic contributions of research by means of an annual report. The proposed mechanism would consider three major categories of economic effects of research: (a) the magnitude of the economic excess generated, (b) the distribution of the excess, and (c) participation and conservation of different production factors.

The specific objective of the system would be to determine the previously mentioned effects, which would allow the ICA and the government to judge the economic rationality of their research spending, in two ways: (a) determining whether the quantities assigned have been evaluated in terms of their implementation with respect to the economic benefits obtained from other options and (b) reorienting resources from specific areas with fewer benefits toward areas that produce greater benefits. The system would have two levels: one of ex ante evaluation of research proposals and another of ex post evaluation of finished research. The proposal focuses mainly on ex post evaluation and suggests beginning evaluation with a valorative methodology (Delphi), in which groups of qualified judges estimate the magnitude of the effects. Parallel to this, the appropriate data bases are established and rigorous models are specified and tested. For data, a wide-ranging collaborative and coordinated effort would take place throughout the ICA with the participating external institutions.

In organizational terms, the system would have a coordinator responsible for it in the Economy Program, which could alternatively be located in the Planning Office. The coordinator would project in-

ternally to the unit and to other programs and divisions under the three assistant manager's offices; externally, to the producer's associations, unions and universities.

Priorities

Given a lack of resources with respect to the scope of research possibilities, there should be priorities established for resources and tasks. Priorities cannot be established simply by considering the expected merits of possible research projects (ex ante evaluation). As an alternative, planning should locate the socioeconomic level that the most important results should reach and concentrate research there to contribute to specific achievements. This has previously been done in the ICA through efforts made by a team from the Ministry of Agriculture (POAS), the National Planning Department, and the ICA. The present proposal offers a conceptual framework to develop priorities.

The main conceptual innovation that the present study offers lies in the integration of the most important variables that affect socioeconomic and research priorities in a systematic and coherent analysis structure. First, a distinction is made between three closely interrelated levels: (a) socioeconomic, production objectives, and benefits; (b) technical, procedural, and production systems; and (c) technological, i.e., knowledge of technical aspects.

The process of production derived from the previous propositions includes the following stages:

(a) *Socioeconomic stage.* Given a selection of policy objectives sought, the species and regions are prioritized separately and individually, and priority beneficiaries are also identified. The results are later integrated to distinguish a "priority range" of beneficiaries, products, and regions for which the general technical and internal technological needs are considered.

(b) *Technical stage.* This stage included the identification of the most important production problems for the "priority range." Among these problems, the ones that have technical limitations or restrictions are identified. These are ordered according to their utility and the urgency with which they must be solved.

(c) *Technological stage.* For the ordered set of problems with technical restrictions, it distinguishes those that can be solved with available technology and those that require research. For the latter group, criteria are proposed to distinguish which can be solved by the ICA within its national research system. Then, the viability is studied, as are the conditions for the search for technological solutions; these are ordered according to the priority of urgency and utility. The final result will allow for the identification of the subgroup of technical restrictions that the

Institute will take on during the specific budget period and for which a budget proposal will be made. Restrictions not included will be considered in later years.

In the verification, approval, and assignation stage, the results are passed on for consideration by the Ministry of Agriculture, which, after reviewing them, will suggest changes or recommend approval and determine the Institute's assignation. The priority study will be coordinated by a technical team from the NPD, the Ministry of Agriculture (POAS), and the ICA. For the scientific, technological, and sociopolitical evaluation, specialists will be sought in and out of the ICA. The generation of points will principally occur through the use of appreciative scales, whose results would be integrated to obtain weighted, aggregate values.

Information

Beginning with the concept of an overall master system, two or three master subsystems (technical and administrative areas or areas corresponding to assistant managers) will be identified and defined with the help of the preliminary base study. As general orientation, a structure according to functional areas and groups would be created in which the teams would be divided and the responsibilities would be decentralized, as far as possible, to be reintegrated into coordination and control networks. In organizational terms, conceptual and operative support mechanisms would be created. Globally, there would be a consultant and planning commission for information systems and a support office. At the level of master subsystems, and later, at the level of specific subsystems or data banks, other mechanisms would be employed. Other points covered by the proposal are those related to the internal policies and support required, especially with respect to equipment and training and suggestions for implementing the recommendations.

Base Evaluation

An inventory, classification, and analysis of the projects and experiments under way was made, which will permit the coherence of activities in progress to be evaluated with respect to the problems and activities pointed out by the NPAR, the 4-year investment plan, the NPAT transfer activities, and operative programming.

Conclusions

The validity of evaluation as an integral stage in the planning process has been closely linked to the 1968 creation of the NCSEP and the NPD. In 1969, the ICA began the organization of its own Planning

Office. By law, the NPD must evaluate the execution and results of general development plans or programs. In turn, the NCSEP recommends the plans and programs that the government submits to the consideration of the National Congress.

The Division for Agricultural Production of the NPD evaluates, in agreement with overall policy, the effectiveness and efficiency of public and private activity in the area of agricultural production and production programs proposed by the Ministry of Agriculture to determine their proposed incorporation into the investment budget for agencies of the agricultural sector. The *ex ante* evaluation of specific projects is done by the Division for Technical Cooperation. In the Ministry, the POAS evaluates the execution of programs and projects in the sector and proposes necessary adjustments.

According to the organizational statutes and decrees of the ICA, the overall evaluation of institutional policies, plans, and programs corresponds to the Management Committee. The overall evaluation of the impact of ICA activities in the sector is the function of the Planning Office, as is the evaluation of projects and activities financed by foreign loans. The IDB project, which is presently being financed with World Bank funds, and the ICA-USDA program for animal sanitation are evaluated by the coordinating offices organized as a requirement suggested by the financing agencies.

With respect to technical activity, the assistant manager's office for agricultural research and transfer is in charge of evaluating the technological limitations and overall production factors by species and ecological areas, as well as the activities carried out by the divisions, the ICA-IBRD coordinating office, and the regional research directors. The programs, projects, and activities are evaluated by the division program and project directors.

Impact evaluation of programs and projects that report to the assistant manager for research at the national, regional, and local levels is the responsibility of the technical support division, which reports to the assistant manager for research as well. The evaluation of the financial aspects is carried out by the assistant manager for administration. The regional managers and the directors of the regional research sections, centres, and stations have not been given any direct, regulatory responsibilities other than the execution of policies, projects, and activities. Although the evaluation function is explicit in the statutes and decrees of the Institute, the degree of fulfillment is generally low for all areas, with very few exceptions. The execution of evaluation activities is uncoordinated, irregular, sporadic, and circumstantial in most cases.

The behaviour of the evaluation function mentioned is closely related to the variables of the activities

of institutional planning, sectoral planning, and the national planning process in general. In practice, the planning process operates only as a mechanism for the assignation of resources, principally because of the lack of national and sectoral long-term plans. In the mid-term, although there are five national development plans, in the majority of cases, they have begun rather late in the presidential administration and without the debate that should take place in the Commission to support politically the objectives and goals of the government.

On the other hand, the agricultural sector has lacked clear long- and mid-term policies to orient agricultural development and technical-scientific activity. The Ministry and the Planning Office have been technically weakened, gradually losing their capacity for formulating plans and programs, coordinating the sector, and following and evaluating the activities of the decentralized institutes.

The definition of priorities has depended mainly on situational conditions and the need to obtain short-term results, which gives immediate information on decisions made. The framework of priorities by product and ecological zones that has been formulated has not had the necessary political consensus to limit frequent changes in priorities, which brings about instability in the directive personnel in the Ministry of Agriculture.

With respect to the stages of the process, except for annual budgeting, the periodic review, and reformulation of the 4-year investment plan and operative evaluation, the remaining stages of the process are not carried out uniformly and systematically. Under these conditions, given the nature of research activity and its results, it is extremely difficult to carry out the planning-execution process for ICA activities in the agricultural sector adequately and systematically. Internally, the low degree of fulfillment of the function is attributed to the lack of an institutionalized planning system, the centralization of coordination and evaluation of execution, complexity of tasks, excessive number of functions, fractioning and possible duplication of activities, and frequent changes in the organizational structure, in general, and in the Planning Office, in particular.

Information, its flow and systematization, is perhaps the greatest factor influencing the evaluation function. Because of the nature of the ICA's functions, volumes of information are utilized and generated in many diverse areas. Historically, however, there have not been organizational structures or essential mechanisms for the appropriate management of information. Throughout ICA's existence, there have been many partial and isolated attempts in different areas and with variable continuity to improve the situation. Although they represent valuable efforts, they also bring the danger of creating a generally

undefined system and unnecessary duplications. The weakness of this critical factor for evaluation and decision-making penalizes the efficiency and effectiveness of the Institute.

Systematic evaluation on an institutional basis of economic impact has been occasionally and punctually done through theses at the National University — ICA Graduate School. The methodology used, for this type of evaluation, as well as for analytical evaluation and the evaluation of results, has only partially touched the range of effects and impact of research. Conceptually, the existing methods are partial and incomplete for systematic evaluation. In the evaluation of economic impact, the globally generated excess, and sometimes its distribution among producers, is considered. When this is the case, there are limitations because other factors are not considered. Methodologically, the studies are based on production functions, numbers, indices, and multivariate analysis. The function of production focus offers greater information, but its usefulness is limited to having the appropriate specifications for the functions and available data.

Base evaluations are not carried out with unified criteria in a coherent, systematic manner. In general, there is little up-dating of studies, given the dynamic rate of change that the Institute must study. The information generated by operative evaluation of the budget is difficult to manage and to publish, which further impedes its distribution and use.

Ex ante evaluation of research projects has not been institutionalized and, therefore, many regional and local projects are carried out without this formality. The economic evaluation of results is also carried out irregularly. The traditional form of evaluation is, with some exceptions, a list of activities and tasks carried out and operative problems, with little reference to what was initially programmed and its expected impact. The necessity of implementing and institutionalizing a planning system is shared by the authorities of the ICA. The methodological proposals formulated at the end of 1984 and the beginning of 1985, especially with reference to institutional philosophy, orientation framework, operative planning, identification and formulation of projects, and the function of follow-up and evaluation, have brought about diverse reactions.

A general criticism of the documents has been the terminology used, their length, and the complicated conceptual level and writing, all of which make comprehension difficult. In addition, the forms that are used to collect the basic program information, its programming, follow-up, and evaluation require greater simplification, both in the number of variables and in the description. This is especially true for financial variables, budget execution, tasks, and activities. The number of reports and their frequency

and complexity have also generally been criticized in the information instruments and flows, which would form the functions of follow-up and evaluation; however, the need to implement, apply, and evaluate the instruments, once the objections raised have been solved, is accepted.

Recommendations

Given the history and the state of the available information analysis, the decision to implement and institutionalize the planning system in the ICA, through successive approximations, is required. It is necessary, however, to facilitate this mandate by means of a management resolution that expresses the general objective, the specific objectives, the products expected, and the participation and information mechanisms with respect to the environment. For internal organization, it would be sufficient to name an action group and the person responsible for it. To support the implementation of activities, there could be national or international technical assistance. At the level of each assistant manager, consensus would be sought for action among the respective division directors.

The implementation and the institutionalization of the system would be an interdisciplinary project that would horizontally and vertically integrate the different activities of the ICA. As such, one of the first tasks for the action group would be the formulation of the project. The ex ante evaluation of the proposal, as well as follow-up and partial and final evaluation, would be the responsibility of the management committee. The adjustment of the documents, instruction guides, and the forms proposed would be one of the most immediate activities. This material would be the principal resource for promotion and training activities of the professional personnel participating in the project.

According to the strategy of successive approximations, it is recommended that the task begin in two divisions and two regional management offices. The divisions would be representative of the areas of research and transfer, on the one hand, and of promotion and services, on the other. Once this first stage is finished, the first evaluation of results would take the place of the mechanisms and instruments used. With this information, the initial project would be reformulated.

The improvement of the evaluation function in the ICA could not be considered without taking on a significant effort to rationalize the use and management of internal information in the ICA. To make this task more concrete, the participation of POAS and the division for agricultural production of the NPD would be helpful. It might also be a good idea

to reformulate the priorities by product and by ecological zone. This should be jointly done with National Planning, the Ministry of Agriculture, Fondo Colombiano de Investigaciones Científicas y Proyectos Especiales Francisco José de Caldas (COLCIENCIAS), and the ICA. The results obtained would be an integral part of the policies for the agricultural sector in the medium and long term. Within this framework of priorities, the NPAR and the NPAT would be immediately adjusted. Given the unity and continuity of the planning-execution process, it should be noted that every effort to improve and strengthen the evaluation function requires parallel actions with the same degree of intensity for the improvement of the programing, implementation, and follow-up stages.

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