Progress Report on the Proposed Approach to Resource Allocation in the CGIAR

Consultative Group on International Agricultural Research

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Summary: At the Ottawa meeting of the Group in May 1986, the CGIAR chairman requested TAC to examine the resource allocation process proposed in the "Budgeting, Financial Management and Reporting in the CGIAR Study" and report to the Group the progress in developing a revised resource allocation process. This document responds to that request by providing the background and outlining the steps being taken. Section II provides the proposed methodology for conducting the resource allocation review by TAC. The TAC methodology paper, initially prepared by Dr. Alex McCalla, chairman of the TAC budget subcommittee, was subsequently discussed in detail with the center directors and the CG secretariat, and appropriately revised.
Section I

Introduction

1. As a result of the slowing down of financial flows to the IAPCs in the late seventies, the Group requested that TAC take an important role in reviewing annually center programs, budgets and their financing requirements. In the past several years, this examination has become more elaborate and burdened the capacity of TAC.

2. The second review of the CGIAR examined the need for long-term planning by the center and the linkage to the external reviews of the centers to a five-year plan for the CGIAR. It also examined the role of the annual P&B review and its linkage to the planning processes in the system. The Group accepted the review recommendations on long-term planning by centers and a five-year plan for the CGIAR. However, the group did not support a recommendation for forming a budget review committee to deal with the annual process and instead suggested strengthening the existing processes. This strengthening was to include incorporating rolling five-year plans by the centers.

3. The budgeting, financial management and reporting in the CGIAR study, launched in 1984 and presented to the Group in 1986, proposed changes in the annual program and budget review process to allow better links to CGIAR strategy and center long-term plans. It established a set of principles for constructing a new resource allocation process on this basis. While these principles have been accepted, some aspects of the proposed methodology have been perceived as not workable.

4. Thus a substantial amount of thinking has been done on designing a resource allocation process for the CGIAR, suited to its structure of governance. This thinking has been considerably helped by TAC deliberations on CGIAR priorities and strategy for the next 20 years and, more recently, the ongoing study of external program and management reviews.

5. The reason the annual program and budget review generates so much thinking is the key role acquired by the process. The external reviews of the centers allow focus on the research programs conducted by the individual centers but not the totality of the system. In the past “stripe reviews” have provided systemwide focus on a particular topic, although without an examination of resource implications. Consequently, only the annual review allows the possibility for examining all the programs of the CGIAR. This is in spite of the fact that an annual examination tends to be only of the items at the margin and does not allow judgements of the entire investments in the various programs. However, due to its perceived direct linkage to the annual funding process, the annual review has acquired a major presence in resource allocation in the CGIAR. Finally, the five-year plan developed in late 1979 for the CGIAR appeared to have lost its relevance by 1982/83. As a consequence, all of the planning efforts were somewhat independent, probably of differing qualities and not particularly relevant in terms of implementation from the perspective of either the centers, TAC or the CGIAR.
Conclusions

6. The thinking in the system about this problem could be summarized in the following statements.

(a) **On the annual process:**

An annual review of programs and budgets of all centers by TAC is not fully satisfactory in terms of both the comparative advantage of TAC and the value added to the overall allocation of resources in the CGIAR.

The size and the complexity of the research programs of the centers makes an annual review of relative priorities across the system impossible. Even if it were possible, the nature of the CGIAR business is not suited for annual reviews of individual program strategies and objectives at the global level.

Unlike a corporate structure, the CGIAR is an informal association of donors supporting thirteen independent organizations. Annual budget reviews of these autonomous entities are neither practical nor productive. Annual budget reviews by definition focus on small items and individual positions in centers. The best judge for these decisions are the centers themselves. The donors and the TAC can only judge trends, strategies, impact and organization performance.

An annual review process is inevitably constrained by the financial outcomes for the particular year. Since these in turn are affected by a whole host of short-term phenomena such as exchange rate behavior, the annual rate of change in finances can differ from the long-term trend. This is evident from the experience of the last several years.

The dependence of the review on the annual supply of funds masks the demand for funds to meet the research objectives for the centers. The supply of funds drives the scope of research programs annually.

(b) **On the need for a longer-term horizon**

The nature of the business of the CGIAR requires continuity and long gestation periods. The research efforts need funding stability and longer-term commitments of support from the donors.

(c) **On the need for a long-term plan**

Since the CGIAR is a "system" with overall objectives it needs a strategy, which it now has, and a long-term plan. While an elaborate detailed plan could become counter-productive, the current size of the CGIAR of almost a quarter billion dollars requires a minimum overall framework.
Objectives for a Process

7. These conclusions lead to the following principles for the resource allocation process of the CGIAR.

(a) The process should incorporate the long-term nature of agricultural research by setting the financial horizon longer than one year, say five years.

(b) Individual center's long-term plans should form the building blocks of the process.

(c) External reviews of the center should provide the basis for resource allocation along with the center's own plan.

(d) Comprehensive examination of center resource requirements, including special projects, should normally follow the external review cycle resulting in funding recommendations for the duration of the planning period.

(e) TAC recommendations should not be limited by arbitrary financial constraints but represent judgements on the resource needs to address the research agenda of the centers and the system.

(f) Once the TAC recommendations are approved by the CGIAR, the centers should have the responsibility to deal with the CGIAR on annual funding.

(g) Finally, the process should be designed to maintain the fundamental financial characteristic of the CGIAR, namely the ability to finance long-term research through annual financial donor commitments.

Implications

8. TAC: Under the new process, the external reviews and the center long-term plans become the basic documents for TAC review of programs and budgets. This would facilitate the linkage between the TAC examination of priorities and their implementation. Finally, the annual review process would be needed only when there are major changes in center programs and/or research objectives.

9. Centers: The review horizon would be more in line with the research horizon. Existing processes for long-term planning would become more important and substantive. Centers would gain more responsibility for dealing with impact of changes in annual funding within the context of an approved program. Annual reporting by the centers would not change although TAC approval of the funds requested may or may not be needed every year, depending on specific circumstances.
10. **CGIAR**: Would have greater understanding of center programs, research objectives and the resource needs to meet them. The CGIAR would also have more direct responsibility for funding centers once their programs are approved by the CGIAR.

Flexible financing by some donors, including the World Bank, which provides stability in center financial planning by serving as the "donor of last resort", would continue. The "rules" for doing so would, of course, be the prerogative of the donor.

The formula donors would need to decide the mechanism against which they would match their contributions. They could continue to match the annual pledges or the approved programs.

11. **CG Secretariat**: This rationalization of the allocation process will not affect several important reporting and monitoring steps. Centers would provide to the CGIAR and the CG Secretariat annual funds request. The CG secretariat would continue to summarize and, if necessary, analyze the evolving trends annually. In addition, the secretariat would also continue its coordination role in these processes. Finally, financial reporting by the secretariat would not be changed by the proposed evolution of the allocation process.

**Steps in the Process**

12. (a) All centers need to adopt common terminology to define their programs and linkages to research objectives.

   (b) An evaluation methodology needs to be agreed upon between all parties so that centers, donors and TAC are clear as to what is being examined and how

   (c) Guidelines need to be developed to document the methodology and develop uniform methods of presentation consistent across centers while being meaningful to each.

   (d) To ensure that the new process is put in place without waiting for the full cycle of external reviews through 1990, a timetable needs to be put in place to use recent reviews or ongoing center strategy definition exercises as the basis.

**Progress to Date**

13. (a) Centers have defined a glossary which is usable to start the process. This glossary will get refined as the process moves along.

   (b) TAC has outlined an evaluation methodology which has been discussed and generally found suitable by most centers. (See Section II of this document.)

   (c) A guideline document has been drafted for center comments. (Distributed separately.)

   (d) Several centers have agreed to initiate the process with others to follow over the course of the next 18 months.
Section II
Methodology for Conducting the Resource Allocation Reviews by TAC

The Problem

14. The CG (its centers) is a process which uses inputs (human resources, physical facilities, land, equipment and supplies) to mount research and research-related activities. These in turn form the building blocks of programs whose objectives are to produce output (products) which contribute to CG goals (TAC's Priority Paper is defined also in terms of products or outputs). The nature of this input-output system is shown in Table 1.

15. The problem is that budgets are defined in terms of the monetary costs of inputs, and programs are defined in terms of expected outputs (products), as are TAC's priorities. The difficulty arises because the intermediate steps of activities and composites of activities (programs defined in an input sense) are not fully understood outside of the centers, and the way in which budgets are linked to programs is not done in comparable terms across centers.

Candidate Activities (with Glossary)

16. TAC reviewed the list of activities and their glossary definitions appended to the report of the joint meeting between subcommittees of center directors and TAC in The Hague. TAC agreed that this list and glossary was a 'reasonable first approximation which could be used by all centers to define the components of their program (Annex I and II). Center directors have expressed a similar viewpoint.

Classification of Activities

17. Given agreement on the list of activities, one of the remaining tasks is:

- How does one decide which activities are essential, which are desirable but not essential, and which are inappropriate for CG centers. Once having classified and attached priorities to activities, how does one decide how large the activity needs to be (scale) and whether the center is presently capable of conducting the activity.

18. Three categories of activities were discussed. However, it was recognized that they may be more a matter of a continuum than of discrete categories.

A. Essential - those activities essential for meeting the CGIAR's objectives for developing countries, and for which CG centers have a special advantage. These activities should be approved for funding for five years.
B. Desirable - those activities which the center is well qualified and which it desires to undertake because of past experience, location, size, etc., but which other institutions may also be well qualified to carry out. They also are important for meeting CG objectives. They would be candidates for annual funding.

D. Inappropriate activities for CG centers - those activities which do not satisfy A or B above. (Please note that this does not say they are inappropriate or necessarily low priority activities for national programs or other international entities. It simply says, given the CG goals and priorities, the CG has no appropriate role to play.)

Criteria and Indicators for Classifying Activities

19. Distinguishing between types of activities is probably the most difficult part of the exercise. It seemed easier to distinguish between A plus B (appropriate) on the one hand and C (inappropriate) on the other.

20. To accomplish categorization of activities one needs criteria which should be able to be described or defined in terms of qualitative and/or quantitative indicators. The three proposed criteria were:

(a) the activity is research or research related;

(b) the activity must be international in character and contribute to a priority program consistent with CG goals;

(c) the CG entity must be better qualified (special advantage) or at least as well qualified as anyone else to undertake the activity. This differentiation was one criterion for distinguishing between essential and desirable classes of activities. Both classes of activities should satisfy the research and international criteria.

21. The following were discussed as a beginning set of definitions to help us in evaluating activities:

(a) Research or research related

For an activity to be a candidate as either essential or desirable it must satisfy one or more of the following definitions (indicators):

(i) Research - discovery and/or development of new knowledge or technology, or

(ii) Research related:

- activity designed to enhance the effectiveness of research, or
- collaboration with other research institutes, or
- training in research methods, or
- assistance in planning, organizing and developing research systems.

If an activity does not meet any of the above definitions, it is categorized as inappropriate and considered no further.
(b) International and CG priority related

(i) International in character

For an activity to be a candidate for either the "essential" or the "desirable" classification it must satisfy one or more of the following definitions:

- must involve more than one developing country. (Activities involved in more countries, people, and continents should receive a higher recognition. Also, should the number of developing countries expressing an interest in the activity be considered? Could these considerations help differentiate essential from desirable activities?)

- requires the movement of people, materials, information across national boundaries; or

- is non-site specific and/or the results are potentially transferable; or

- involves the opportunity for collaboration with developing country programs and/or advanced institutions.

(ii) CG (TAC) priority of program

- Is the activity a necessary component of a program that has been identified as a priority by the CG (TAC)? If not, it is likewise inappropriate.

(c) CGIAR Special Advantage

Activities which meet (a) and (b) are candidates for CG support. How then to differentiate between essential and desirable? The discussion focused on the notion of special competence.

(i) Essential activities:

It was proposed that, to be identified as essential, an activity must meet most of the following conditions:

- a center can conduct an activity at a lower cost (more efficiently and effectively) than any other entity;

- continuity (sustained efforts) is critical to low cost and rapid pay-off, and no other entity can assure that continuity;

- positive benefits exist in terms of rapid international exchange of materials and information which no one else can or is willing to do;

- positive interrelationships with other center activities (spill-over effects); and

- the potential pay-off is high relative to costs.
(ii) **Desirable activities**

would be those which a center can do as efficiently and effectively as any other institution, but for which it does not have the unique advantages listed above.

**Scale of Activities**

22. If the centers and TAC are successful in classifying activities, and thereby setting priorities, there still remains a question of how large the activity should be above minimum critical mass. The appropriate scale of an activity should relate to the following factors:

(a) the size of the problem being addressed - indicators include:
- number of hectares involved;
- geographic dispersion and ecological diversity;
- number of people benefitted;
- number of national programs involved.

(b) the state of the existing research base relative to the objective of the activity;

(c) the probability of success, and whether this increases with a larger scale, more comprehensive and concentrated effort (relates to researchability of the problem);

(d) the minimum time frame necessary for possible success;

(e) state of development of relevant national programs.

These variables, plus possibly others, should allow us determination at least whether small, medium or large activities are needed. They should also help understand why the same activities at different centers necessarily differ in size.

**Research Capacity**

23. The final question to be asked is:

Does the center proposing the activity have the capacity to undertake the activity at an appropriate scale? Indicators here include:

(a) critical mass: is it available?
(b) facilities,
(c) complementary capacity in related activities/programs, and
(d) quality and skills of appropriate scientific staff.

If a center does not have the capacity, the judgement must be to either provide the necessary augmentation of resources (budget) or not undertake the activity. Clearly underfunded and inadequately staffed programs are inefficient and have a low probability of success.
The Process in Summary

24. The sequence of questions and necessary evaluations just presented is summarized in Table 2. To begin the process, centers would be asked to prepare five-year budgets in terms of activities and programs. TAC would then look at center programs defined in terms of activities (with budget attached). TAC would first decide whether activities are components of a priority CG program and determine whether they are research or research related and international. The criteria would then be applied to classify them as A or B. Then, scale and capacity would be reviewed, and TAC would make its collective judgement in terms of the longer-term budget needs of the center.

Some Issues Requiring Further Discussion

25. In the TAC discussion of the proposed process, several issues were raised which the Committee considered should be discussed jointly with Center Directors. These were (in no particular order):

(a) How should center-wide support services (e.g. analytical, library, printing and duplicating, etc.) and overall center general administration and management costs be included in an activity-based budget?
   Tentative answer: Specific services should be identified and their scale discussed. A ratio approach would also be suitable.

(b) How would the process apply to new activities and programs?
   Tentative answer: This would require a priority evaluation by TAC before budgets would be reviewed.

(c) How would significant changes in center programs be treated between the periodic full-scale program review?
   Tentative answer: Clearly the system would require flexibility and therefore should include provision for extraordinary amendment of the budget for essential activities. Centers should be discouraged, however, from seeking annual, incremental adjustment in their essential budget.

(d) Should TAC be involved in long- and short-term budget evaluation only at the activity and above level?
   Tentative answer: Yes. Involvement in greater budget detail would return TAC to current practices which are deemed less than satisfactory.

(e) What is a program?
   Tentative answer: TAC to date has agreed to use the center's definition of program.

(f) Related to (e) above is the question: should large programs be treated differently than small ones in terms of the review process?
How would the annual P&B reviews be linked with the longer-term process?

Tentative answer: Centers could annually propose, in programmatic terms, additions to or alternations of desirable activities for which they are qualified. TAC would evaluate them in terms of the overall approved longer-term budget and assign priorities 1, 2 and 3, or it could judge them inappropriate.

26. Other issues needing clarification may also arise in further discussion with center managements.

The Process of Implementation

27. Assuming that centers and TAC agree on a process, the other task is deciding how to implement it. TAC expressed a preference for option iii (report of The Hague meeting):

"Four centers namely IBPGR, IFPRI, ISNAR and ILRAD have recently been reviewed externally by TAC. TAC could hold discussions with these centers at the 41st meeting of TAC to initiate a new budget procedure. By June 1986 TAC will have finalized the mid-term review of WARRA and the EPR of ILCA. These two centers could be brought on board by March 1987. IITA is currently undertaking an indepth review of its programs and might also be ready to try the new procedure by March 1987. EPRs for IRRI and CIMMYT have been scheduled for 1987 followed by CIP and CIAT in 1988. Centers like ICARDA and ICRISAT might wish to join the new procedure before the end of 1988 and the new budget process could be formally in force by 1989 or 1990."

Conclusions

28. In its March 1986 meeting, TAC agreed that this sequential process of looking at center budgets represents an intellectual framework that TAC could use as a guide (along with other considerations including the TAC priority paper) in making a detailed zero-based budgetary evaluation of center budgets at periodic intervals. It also agreed that the most appropriate time to do this would be in the year immediately following a center's EPR. The Committee tentatively endorsed the general character of the process as a useful guide for rational decision-making, but deferred detailed decisions until it has had a further opportunity to interact with center directors in June.

29. Based on the positive interaction with center directors in June 1986, the next steps in the new process are now being undertaken. These include wide circulation of this document along with a context statement and draft guidelines for preparing center proposals. In turn all centers will be experimenting with the use of the proposed activity definitions. It is expected that further discussions between centers and TAC in October 1986 will lead to the implementation of the process starting in 1987.
Table 1
The CGIAR as an Input-Output System

<table>
<thead>
<tr>
<th>Activities</th>
<th>Program A</th>
<th>Products</th>
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<tbody>
<tr>
<td>1</td>
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- Inputs

1. Water Management Research
2. Wheat Program
3. Nutrition Policy Program
4. Germplasm

- Outputs

- CC Goals

- Program A
- Program B

a) Human Resources
- Senior Scientists
- Post-Docs
- Support Staff
- Contract Research

b) Facilities
- Laboratories
- Fields
- Equipment

(c) Financial Resources
- Supplies
- Travel
- Etc.

The Problem: How to convert:

a) Budgets that are defined in terms of inputs (in a rational, objective fashion) into terms of products and outputs (as is TAC Priorities Paper)
Table 2
The Process of Longer-Term Budget Evaluation

Step I: Is an activity a candidate for CG support?

Questions:

1. Is it research or research related?  
   Yes [ ]  
   No [ ] \rightarrow Inappropriate.

2. Is it international in character?  
   Yes [ ]  
   No [ ] \rightarrow Inappropriate.

3. Is it a necessary component of a CG program?  
   Yes [ ]  
   No [ ] \rightarrow Inappropriate.

   Yes [ ] = Candidate for CG Support.

Step II: Is it essential or desirable? Use indicators to decide.

(Clearly TAC judgement required here.)

\[ \begin{array}{c}
\text{Essential} \\
\downarrow \\
\text{Desirable}
\end{array} \]

Step III: What is the appropriate scale? (See indicators. Again, TAC judgement required especially between activities if there is a budget constraint.)

\[ \begin{array}{c}
\text{Scale} \\
\downarrow \\
\text{Scale}
\end{array} \]

Step IV: Does the center presently have the capacity to undertake the activity at the needed scale?

Yes [ ] \rightarrow Approve.

No [ ] What additional resources are needed? Should additions be recommended?
ANNEX I

List of Candidate Activities

1. Water Management Research
2. Soil Management & Conservation Research
3. Agroclimatology Research
4. Germplasm
   a) Research on conservation and diversity
   b) Collection
   c) Conservation, characterization and documentation
   d) Enhancement
   e) Plant breeding/improvement
   f) International trials (distribution & exchange of breeding material)
5. Seed Production
6. Crop Systems Research
7. Livestock Systems Research
8. Crop-Livestock Systems Research
9. Plant Protection Research
10. Plant Nutrition Research
11. Machinery Research and Development
12. Livestock Nutrition Research
13. Livestock Reproduction Research
14. Livestock Disease Research
15. Human Resource Enhancement
   a) Specialized courses (short-term)
   b) Visiting scientists/fellows
   c) Post-doctoral programs
   d) Degree-related
16. Conferences and Seminars
17. Documentation and Dissemination
18. Research on Approaches, Concepts, Methodologies and Procedures
19. Counselling and Advising NARS
20. Technical Assistance
21. Coordination of Networks
22. Economic and Social Analysis at Micro-Level
23. Market Analysis
24. Policy Analysis
25. Nutrition and Consumption Analysis
26. Research on Research
27. Exploratory Research
28. Conversion and Utilization Research
ANNEX II

CGIAR: Across the System Glossary of Activities

FIRST DRAFT

1. Water Management Research:
   Includes research directed to the conservation and management of rainfall and/or irrigation water.

2. Soil Conservation and Management Research:
   Research to maintain or improve the fertility and productivity of soils, as a component of the development of more productive, sustainable systems of agriculture.

3. Agro-climatology (agro-ecology - research):
   Research on the characterization, classification and mapping of climate and soils for international agricultural research.

4. Germplasm 1/
   (a) Research on conservation methodologies (seed, tissues) and patterns of genetic diversity.
   (b) Collection and acquisition of germplasm (includes a research component).
   (c) Maintenance of conservation collections (seed, tissues) and the distribution, characterization and documentation of collections (Genebanks).
   (d) Germplasm enhancement; wide crossing and "pre-breeding".
   (e) Plant breeding; the improvement of plants including specific evaluation of germplasm.
   (f) International trials; distribution and exchange of breeding (elite) materials (not primitive germplasm - see (c) above).

5. Seed Production:
   Increase of seed of elite materials, its certification and release.

1/ This is subdivided to separate research and service functions
6. **Crop Systems Research**

Includes research on existing systems to identify the social, biological and physical constraints to greater production, and the development of more productive, sustainable crop systems.

7. **Livestock Systems Research**

Includes data gathering and research on existing systems to identify constraints to production.

8. **Crop-Livestock Systems Research**

Integrated studies of 6 and 7.

9. **Plant Protection Research**

Research on the economic control of diseases, pests and weeds of crop plants, including studies of integrated pest management systems and their components.

10. **Plant Nutrition Research**

Includes research on crop nutrition requirements, the availability and uptake of major and minor elements, and fertilizer management studies.

11. **Machinery Research and Development**

Research and development of appropriate machine technology.

12. **Livestock Nutrition Research**

Assessment of nutritional status of livestock in different ecological locations and the interaction with availability of feed resources and disease susceptibility.

13. **Livestock Reproduction Research**

Integrated study of estrous in African zebu cattle, field study of reproductive diseases, transmission and limitation of fascioliasis in highland areas, genetic relationships among African breeds.

14. **Livestock Disease Research**

Epidemiology and improved control, trypanosome antigenicity and biochemistry, and comparative immunity and genetic resistance to trypanosomiasis.

15. **Human Resource Enhancement**

Manpower development, including short specialized training course, post-graduate research, study tours, etc.
16. Conferences, Seminars and Workshops

To foster the build-up of NARS capacities and the effective functioning of international research collaboration; forums for discussion of scientific cooperation among the partners in the global System (IARCs, NARS, specialized institutions); stimulating horizontal transfer of information and technology among NARS.

17. Documentation and Dissemination of Information and Materials

Efforts to systematically use the global knowledge base in areas and disciplines of relevance to Centers' research programs and to make available to NARS (the System's primary clients) relevant information on process and output of Centers' research programs, making available through newsletters, publications and abstracting services relevant information.

18. Research on Procedures

Analysis of research and research management processes aimed at the development/enhancement of approaches, methodologies and tools for conducting these processes. The procedures generated relate to: biological/technological research, i.e. technology generation efforts and organization and management of NARS.

19. Counselling and Advising NARS

Assisting NARS through the provision of advice and counsel. This covers a range of subjects/topics and includes the biological sciences (conduct of research) and the organization and management field (organization and management of NARS). Primary objective: build up of NARS capacities (institution building).

20. Technical Assistance

Providing assistance to NARS in the conduct of essential research functions, i.e. helping NARS to perform these functions. This ensures that essential functions are performed in the research/technology generation process. (The build-up of national capacities is a collateral concern).

21. Coordination of Research Networks

Organizing, coordinating, managing or backstopping of collaborative research efforts among various partners in the global research System to build up national capacities; the objectives cover a broad range and include:

- research/technology generation (global germplasm network, global/regional/topic specific information exchange, etc.)
22. **Economic and Social Analysis at Micro Level**

Research to determine the economic and social effects and implications of technologies or policies as they affect people, by examining farm or village data.

23. **Market Analysis**

Research to determine the market level economic conditions that may result from various technologies, institutions or policies.

24. **Policy Analysis**

Research to determine the desirability of alternative policies from the viewpoint of the total society.

25. **Nutrition and Consumption Research**

Research to determine the relationship between such factors as nutritional composition, food quality, income, price, socio-economic characteristics and nutritional status of people.

26. **Research on Research**

Research to determine, ex post, the impact that technological, policy or institutional innovations have had, and ex ante the likely impact that such innovations may have in the future.

Analysis of research objectives, processes, products (outcome) and impact aiming at the generation of information on such issues as:

- impact, usefulness and relevance of research programs to the System's goal;

- cost effectiveness of the System's research efforts'

- potential improvements of research programs in terms of relevance to clients' needs, etc.

27. **Exploratory Research**

Initiation of path-breaking research which appears to have potential.

28. **Conversion and Utilization Research**

Research to develop more effective ways of treating commodities to reduce losses in the marketing system, improve the quality of foods by after-harvesting processing.