Document of the
International Fund for Agricultural Development

Evaluation of
IFAD's Technical Assistance Grants Programme for Agricultural Research

Corporate-level Evaluation Report

June 2003
Report No.1377

Photograph on cover page:
The Republic of Kenya, Programme for Trial and Validation of Promising Income Generation Options for the Rural Communities in Africa based on Sericulture and Apiculture Technologies – TAG ICIPE-491
Farmers receive training on mulberry planting in Naru Muru, Kenya
Source: Dr Suresh K. Raina

Docs Open 323096

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Corporate-level Evaluation Report

Table of Contents

LIST OF TABLES

LIST OF FIGURES

APPENDICES

ANNEXES

Annexes are available upon request from the Office of Evaluation.

ABBREVIATIONS AND ACRONYMS*

AR	Agricultural Research
AR&T	Agricultural Research and Training
ARI	Advanced Research Institution
CBO	Community Based Organization
CGIARS	Consultative Group on International Agricultural Research
CMB	Cassava Meal Bug
CPM	Country Portfolio Manager
EB	Executive Board
EB PRR	Executive Board - President's Report and Recommendations
FAO	Food and Agriculture Organization
FC	Controller's Office of IFAD
FFS	Farmer Field School
GSM	Green Spider Mite
HPI	Human Poverty Index
IARC	International Agricultural Research Centre
ICAR	Indian Council for Agricultural Research
IPM	Integrated Pest Management
IPR	Intellectual Property Right
LP&C	Lending Policies and Criteria
M&E	Monitoring and Evaluation
NARES	National Agricultural Research and Extension System
NARS	National Agricultural Research System
NENA	Near East and North Africa
NGO	Non-Governmental Organization
NRM	Natural Resource Management
NTFP	Non-Timber Forest Product
PA	Africa I Division of IFAD
PF	Africa II Division of IFAD
PI	Asia and the Pacific Division of IFAD
PL	Latin America and the Caribbean Division of IFAD
PN	Near East and North Africa Division of IFAD
PMD	Programme Management Department
PRA	Participatory Rural Appraisal
PT	Technical Advisory Division of IFAD
R&D	Agricultural Research and Development
SA	South Asia
SC	Steering Committee
SSA	Sub-Saharan Africa
TAG	Technical Assistance Grant
TAN	Technical Advisory Note
TRC	Technical Review Committee
UNDP	United Nations Development Programme
WARCORP	West African Regional Cooperative for Research on Plantain

*** All Acronyms for CGIARs and Non-CGIARs are spelled out in Appendix 2: List of Grant Recipient Organizations.**

Evaluation of IFAD's Technical Assistance Grants Programme for Agricultural Research[1]

Corporate-level Evaluation Report

AGREEMENT AT COMPLETION POINT

I. OVERVIEW OF MAJOR FINDINGS

1. The Agricultural Research grant funding line of the AR&T Programme has been evaluated for the first time since its establishment in 1979. From 1979 to 2001, a total of USD 171.541 million has been allocated for 199 agricultural research grants, to a total of 32 International Agricultural Research Centres. Of these, 16 have been CGIAR centres, and 19 have not been part of the system. Grants have ranged in size from USD 150 000 to USD 4 million, with an average size of USD 1.35 million.

2. Through this programme, and its link with the CGIAR system, IFAD has played an important policy and advocacy role in promoting pro-poor agricultural research.

3. Over the years, the focus and nature of the programme has gradually changed. On the one hand the programme has come to increasingly finance research in a much wider range of sectors, and a greater diversity of research topics. On the other, the nature of the research has become more short-term and downstream, more multidisciplinary, more farmer and women participatory, and more localized in nature.

4. The evaluation found most grant projects to be well designed. Implementation over the 23-year period has shown greater variance in terms of achieving grants goals and objectives. Realism in design, variance in national and international institutional capacities, types of research undertaken, extent of integration of socio-economic factors, extent of farmers participation, and quality of supervision played a role in determining performance. There has been a notable impact on building capacity for pro-poor research, particularly at the national (NARS) level, at least in the short-term. Impact on poverty was clear in several instances, although proved hard to assess in others for a number of reasons, including the indirect nature of the impact process and the multiple factors often involved. Overall, while the likely rural poverty impact appears moderate, it may possibly be higher than what transpires from available evidence.

5. Overall, the programme is faced with three main challenges:

i. ***The need to make better use of scarce resources***, through: (i) strategically focusing on a limited number of priority areas, towards a balanced mix of longer-term strategic innovation-generating research and short-term problem-solving research, in line with the research needs of IFAD investment portfolio and IFAD's new strategic emphasis; (ii) making full use of the available human resources for the programme, through improvements in efficiency and a rigorous investigation of the programme's effective needs in this area.

ii. ***The need to ensure consistently good performance of the research funded,*** through: (i) paying more attention to capacity, especially at the national levels; (ii) providing additional guidance to grant applicants and recipients.

iii. ***The need to enhance poverty impact of research outcomes,*** through: (i) measures to further strengthen linkages with rural poverty focused research application and uptake pathways,

[1] The Core Learning Partnership for this evaluation was composed of the Director of the Office of Evaluation (OE); the Director of the Technical Advisory Division (PT); the AR&T Programme Manager in PT; the PT Technical Adviser, Agronomist; three Task Managers of the Regional Divisions Managed Grants; Representative of PD Front Office; Representative from CGIAR Institutions, Representative from Non-CGIAR Institutions; and the IFAD Senior Evaluator in charge of the evaluation.

especially with IFAD's investment programme; (ii) allowing more time to achieve good results; and (iii) improving impact evaluation.

6. The recommendations and implementation plan are designed to respond to these above challenges.

II. AGREED UPON RECOMMENDATIONS AND IMPLEMENTATION PLAN

1. Developing a Research Strategy for IFAD

At present the programme is attempting to do too much with its limited resources. Priorities and selection criteria have been defined since May 2000. Since then, IFAD has adopted the Strategic Framework 2002-2006. A more selective and priority focused approach is now needed. To date, the programme has not had an agreed-upon strategy for guiding IFAD's catalytic contribution in this area. The preparation of a research strategy for the programme will need to build upon IFAD's Strategic Framework, the Regional Research Strategies and the new policy on TAG, which is currently being developed.

The strategy would need to cover, inter alia: (i) the programme goal and general objectives; (ii) the type or types of research IFAD should and should not finance, including the extent to which it should be strategic or downstream and how innovative it should seek to be; (iii) the type and characteristics of Research Institutions that should benefit from IFAD's grants; (iv) specific thematic priorities or technology gaps which have greatest importance for 2003- 2006 (to be reviewed periodically); (v) the extent to which the research would be expected to link with and contribute directly or indirectly to the IFAD loan programme

Implementation Plan: PT to organise the preparation of the strategy in close consultation with PMD, EAD, OE and partners IARCs. The Strategy should be guided by the IFAD Grants Policy currently under preparation by the VP-chaired Task Force.

Time of Delivery: October 2003 (final draft circulated in-house).

2. Strengthening the Contribution of Grant Financed Research to the IFAD Investment Programme

In general, the evaluation found the programme to have growing poverty relevance, and particularly since 1998 growing relevance to the IFAD investment programme. But the systematic contributions of individual TAGs to individual loan projects could not be established. Various Board documents have reiterated that the programme's chief purpose is to expand, prepare and support the opportunities for investment by IFAD. The evaluation found a few notable successes of "direct supporting input," but overall, little evidence of effective linkages to loan projects. Grants progress reports, supervision reports and completion reports rarely provide information on this aspect. Clearly, direct grant support to loans is always easier where the research produces identifiable and poverty–appropriate technology outputs, with clearly visible benefits and attraction to farmers. On the other hand, many loan projects with which linkages were sought, had their own share of implementation problems to allow for fruitful links to emerge, despite genuine effort. Links were more likely to occur with farmer-participatory downstream research. However, longer term or more strategic research can achieve linkages with the future loan portfolio the potential of which should be identified up-front and its achievements ensured through systematic follow-up. The onus for this should lie jointly with the Regional Divisions and PT. The IARCs recognized this issue and are willing to work closely with IFAD in achieving better linkages.

Specific measures, identified by the evaluation, for enhancing grant-loan linkages, include: (i) introduction of joint loan-grant planning from loan project inception stage which would require strengthening related communications between IFAD CPMs, TAG-project co-ordinators and IFAD grant TAG Managers; (ii) preparation/finalization of IFAD regional division agricultural research strategies, covering both loan and grant funded research, and with clearly identified priorities (this would also feed into preparation of an institutional strategy for the programme); (iii) transforming the *current data base of the programme to a corporate-access data base, not limited to closed and ongoing approved grants, but also pipeline applications, in order to ensure greater transparency as well as information for planning purposes; (iv) wider sharing of information on technology outputs of the programme through Technical Advisory Notes (TANs) on the IFAD sub-site, as well as through other information networks and dissemination mechanisms.*

Implementation Plan:

(i) PI, PL and PF to finalize their agricultural research strategies, with PT support, as needed.
(ii) PA to revise its 1999 agricultural research strategy in light of lessons learned from TAG implementation.
(iii) PMD to consider a scheme for joint planning of grants and loans, to be the basis for the operational work programme.
(iv) PT to establish a corporate-access database for the programme, in consultation with PMD.
(v) PT to encourage finalization of pipeline TANs for the IFAD web site.

Time of Delivery:

(i) Finalization of Regional Research strategies – by September 2003.
(ii) Revision of PA Strategy – by end 2003.
(iii) Loans-Grants joint planning system– by September 2003.
(iv) Corporate-access database by May 2003.
(v) 50 TANS on IFAD web sub-site by June 2003.

3. Enhancing the Poverty and Institutional Impact of the Programme

The impact of the programme should have two main dimensions – impact on poverty and impact on institutional capacity. As mentioned earlier, the evaluation found that the impact of the TAGs on poverty is hard to assess and attribute only to IFAD, because of the indirect nature of the impact process and the multiple factors involved. This difficulty is aggravated by lack of access to impact assessments except in a few cases, and by the quality of data. Using a specially developed framework for predicting the "poverty impact potential of TAGs"; the evaluation found that only a fraction of the reviewed TAGs had completed the development of poverty appropriate products and prepared the way for their dissemination and adoption. Impact on institutional capacity was clearer, particularly among national level research partners, such as research organizations, universities, and to a lesser extent NGOs and CBOs, though its sustainability could not be verified. The urgency of further capacity building at this level was underlined by the evaluation field visit findings, which showed that IARCs were in many instances taking a larger than necessary role in conducting field level research, instead of NARS, because of variability in the latter's capacity. However, it must be noted that IFAD has played a leadership role in the development of methodologies for Poverty Impact Assessment of Agricultural Research, with contributions to International Conferences on the subject – in Costa Rica in 1999 and 2001; and support to the CGIAR Standing Panel on Impact Assessment and other publications on the subject.

Measures that IFAD should take to enhance the poverty impact of the programme include: (i) increase TAG duration to up to five years, as indicated in policy documents, to allow more up-front time for better situational assessment (particularly local socio-economic conditions), and post-research time for impact evaluation; (ii) greater attention to both assessment of national capacities and to building missing capacity for participatory research; (iii) introduce a system applicable to the design of all research TAGs to enhance impact monitoring and evaluation during implementation and at completion with inclusion of earmarked funding for the purpose and agreeing on some relevant indicators, including for measuring utilization of grant outputs by IFAD investment projects.

Implementation Plan: PT, in collaboration with Regional Economists and partners IARCs.

Time of Delivery: December 2003.

4. Reviewing Resources Available for the Programme

The financial resources devoted to the programme will be determined on the basis of strategy deliberations. The evaluation was not mandated to look at the human resources allocated to the programme, nor at this particular aspect of efficiency. However, staff working in PT have expressed the view that human resources for the programme are inadequate. Evaluation findings confirm that better grants performance is associated with intensive supervision that could well require more adequate resources. Backlogs in processing of grant proposals and of TANs and responding to queries by IARCs could also be due to limited resources. Regional divisions seem reluctant to take on additional management responsibilities in view of limited resources and exposure/experience of field research and/or capacity.

It is therefore recommended that a review be conducted of the current resource allocation to the programme. Issues that the review could address include: (i) a review of the financial resource allocation situation and its implications; (ii) the present HR utilization in grant processing and implementation management; (iii) whether designation of a full time co-ordinator, would serve to enhance efficiency; (iv) are resource constraints affecting supervision intensity and quality? Are there newer more efficient ways to finance supervision e.g. earmarking funds for supervision under each grant; reinforcing field visits through electronic dialogue and monitoring etc.?

Implementation Plan: PT and PD Front Office guided by the IFAD Grants Policy currently under preparation by the VP-chaired Task Force.

Time of Delivery: September 2003.

5. Enhancing Policy Dialogue and Advocacy to Reinforce IFAD's Global Innovation Role

The evaluation recognizes the important global policy and advocacy role performed by IFAD through the AR Programme activities and the CGIAR mechanism. In collaboration with its partners, IFAD has promoted the poverty focus of the GGIAR system organizations, became a founding member of GFAR (Global Forum on Agricultural Research), is taking a leadership position in CGIAR's Special Programme for Impact Assessment (SPIA), and most recently became a formal Co-Sponsor of the CGIAR system.

IFAD should build on this past advocacy experience and collaboration to continue to influence donor efforts towards addressing new and innovative research areas or methodological gaps, where these could enhance the impact of research efforts on poverty. This should include: no till farming; water harvesting; design of improved farm tools especially for women farmers, the elderly, and children – in areas where the labour pattern in agriculture has been changed due to socio economic factors including the spread of HIV/AIDS. Regional Agricultural Strategies should pay particular attention to these and other areas of innovations.

Implementation Plan: PT and Regional Divisions through IARCs, CGIAR and related mechanisms.

Time of Delivery: Continuous.

6. Reassessing the Institutional Spread of Programme Resources

The evaluation findings suggest that, with some notable exceptions, much of the allocation of resources under the programme has been driven by IARC's perceived comparative advantage and capacity in a given research area. This has resulted in certain international research centres, both among CGIARs and non-CGIARs, receiving a large proportion of available funds. However, a comparison of the grant programme sectoral focus with that of the IFAD lending programme, reveals inconsistent trends. The preparation of a strategy for the programme will provide the basis for a clearer understanding of whether the present cohort of institutions does, or does not cover some of the newer issues and concerns of the lending programme and whether inclusion of additional, or different, grant recipients could result in a better match with the investment portfolio.

As part of the efforts to develop the new AR Programme strategy, IFAD should review the existing institutional spread of grant resources. Among issues to be addressed are: (i) whether the emerging research needs of IFAD argue for directing some of IFAD support to other non-conventional international institutions, for instance, those international development-oriented NGOs, which have a strong research focus; (ii) whether the localization and farmer-participatory nature of research activities would argue for allocating a larger proportion of resources within grants to the country level.

Implementation Plan: PT and Regional Divisions.

Time of Delivery: September 2003 in view of PT's Task Force.

7. Improving Internal Processes and Procedures of the Programme

The programme has made many improvements in procedures over the years, particularly through introducing screening criteria and procedures in 2000. However, additional improvements may be appropriate to further ensure that information is equally shared among potential applicants, that the most deserving grants are financed, that the process of grant implementation proceeds smoothly, and that the lessons and technology generated by the programme can achieve maximum impact. The recommendations to IFAD made by respondents to the institutional survey, which was conducted by the evaluation, provide some very useful feedback on what is needed.

On the basis of the specific recommendations made in the evaluation, IFAD should: (i) provide more practical guidance to grant applicants and recipients on application, reporting and impact assessment; (ii) continue to further strengthen the grant review and selection procedures, particularly at early entry (concept) point, to eliminate personal factors and ensure fair competition; (iii) review the impact of the 2000 screening procedures and processes over their "trial" period, to note any need for improvement; (iv) improve speed of application processing and the general responsiveness to IARC queries.

Implementation Plan: PT and regional divisions in consultation with partners IARCs.

Time of Delivery: September 2003.

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EXECUTIVE SUMMARY

I. INTRODUCTION

1. **The Strategic Framework for IFAD 2002-2006 (SF)** identifies "Improving Access to Productive Natural Resource and Technology" as one of the three strategic objectives to enable the rural poor to overcome their poverty. In the context of high pressure on land and water resources and the choice faced by poor farmers to restore land fertility or migrate to cities, it states that:

Appropriate technologies and research to improve farm productivity by boosting returns to land and labour are essential if the former choice is to be a viable option. As solutions are often context-specific, technologies need to be developed through appropriate research and validated working together with the rural poor –something that is still quite rare. Full appreciation needs to be given to the existing risk-management strategies of small farmers. These often differ for men and women farmers, requiring gender-differentiated approaches (SF, page 10).

2. The importance of agricultural research for rural poverty reduction has been recognized by IFAD since its inception. Financing agricultural research on a grant basis as part of IFAD's technical assistance programme was explicitly mentioned in IFAD's Lending Policies and Criteria. At that time the agenda was defined very broadly. IFAD's programme of technical assistance grants for agricultural research (AR/TAGs) was established in 1979 to provide grant support to the international agricultural research centres (IARCs) and, through them, to the national agricultural research systems (NARS). In all, a total of USD 171.5 million has been allocated for 199 grants from 1979 to December 2001. Traditionally, such grant recipient organizations are made up of two groups: centres of the Consultative Group on International Agricultural Research (CGIAR) and non-CGIAR centres2.

3. Goal and objectives of the programme. IFAD's approach in supporting agricultural research is embodied in a number of Executive Board policy documents between 1979 and 1991 and an internal 1997 document. In all of these documents the objectives and coverage of the programme remained broad, without clear prioritization. This has led to a wide-ranging interpretation of the role of the programme in-house and by IFAD partners. The linking of AR/TAGs with IFAD projects to enhance their poverty impact has always been central to the programme. There has been consistent emphasis on the contribution of grant-financed research to the technological base of the IFAD investment programme. The overall goal of the AR/TAG programme is seen as contributing to the reduction of rural poverty through the following means. These can be considered programme objectives, although they have never been stated clearly as such in a policy paper:

- develop and adapt appropriate and sustainable technologies within a reasonable span of time in support of resource-poor farmers and the rural poor;
- promote IFAD's partnership with IARCs so as to influence their agenda towards pro-poor research;
- strengthen the capacity of these institutions and NARS for pro-poor research and training;
- support technology-related socio-economic research to ensure relevance and sustainability;
- generate knowledge and information on appropriate agricultural technologies and practices.

[2] The 'non-CGIAR' group is used for classification convenience by IFAD and is not an internationally identifiable group as such.

II. THE EVALUATION

4. There had been no comprehensive evaluation of the AR/TAG programme in the more than two decades of its operation. This evaluation was requested in the context of the formulation of an IFAD policy for the use of grant funds. The evaluation's main objectives are to: (i) assess the achievements of the programme in relation to its objectives; (ii) analyze main trends in AR funding and the current relevance of the programme to IFAD's strategy and priorities; (iii) identify and analyze factors that have affected the programme's operations and likely impact; (iv) provide recommendations for future orientation of the programme and building blocks for articulating a strategy of grant resource allocation.

5. The evaluation methodology. The evaluation was designed to be participatory, involving recipient organizations and IFAD staff. The evaluation process was both desk and field based. It adopted a four-pronged approach: (i) a desk review of all available documents for a sample of 42 grant programmes (mostly closed) involving 67 TAGs out of the 199 approved between 1979 and 2001 (i.e. 34% of the total); (ii) discussion with a range of IFAD staff, particularly those involved in AR/TAG processing and management; (iii) a formal survey of recipient institutions (31 institutions were surveyed and 25 responded, i.e. an 80% response rate); and (iv) field visits to nine selected grant recipients in Africa (ICIPE, ICRAF, IITA, ILRI), Asia (IRRI), the Near East (ACSAD, ICARDA) and Latin America (CIP, IICA) and to some cooperating NARS.

III. OVERVIEW OF THE PROGRAMME

A. Programme History and Development

6. During the very early years, the programme's research emphasized commodities and was heavily food-crop oriented. In these years, IFAD supported CGIAR centres3 with the aim of adapting the technology thus created to the needs of resource-poor smallholders, and of influencing the research agenda of the CGIAR system towards resource-poor, smallholder production systems. The early emphasis on commodities soon gave way to a progressive shift towards farming systems and related socio-economic research and sustainability issues. In time, the programme became more end-user oriented and aware of the location-specific nature of pro-poor research and it widened its institutional coverage.

7. Over the years, the programme itself became more systematized. A set of formal guidelines for AR/TAGs were first prepared in 1997. The programme was seen as an instrument that "focuses on the development, through applied and adaptive research, of innovative and effective means to eradicate rural poverty"4. These guidelines and the associated internal screening processes represented an attempt to direct the programme in accordance with IFAD's strategic focus and priorities and to make it more useful to the Fund's loan portfolio. In mid-2000, grant screening and selection procedures were strengthened and applied within a competitive grants system, based on scoring against specific criteria, to identify the most appropriate research and training grant ideas for entry into the pipeline[5].

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[3] The CGIAR started in 1971 as an early endeavour of the international community to develop a global agricultural research system based on donor funding. This system is currently sponsored by IFAD, the United Nations Development Programme and the World Bank. Starting with a few international centres, it has grown into an association of 58 public and private members that supports a system of 16 specialized international agricultural research centres. The most recently formulated mission of the system (2001) is "to achieve sustainable food security and reduce poverty in developing countries through scientific research and research-related activities in the fields of agriculture, forestry, fisheries, policy and environment". In an effort to maximize the effectiveness of the global research efforts, at the end of 2001 the CGIAR system introduced the global challenge programmes to support high-impact research that tackles issues of overwhelming global and/or regional significance and requires partnerships among a wide range of institutions.

[4] Guidelines for Agricultural Research and Training TAGs, Programme Management Department (PD), December 1997 (internal document), p. 1.

[5] The main criteria are the following: (a) the grant proposal should address problems and opportunities of high priority to the rural poor; (b) the proposal should address issues and concerns of relevance to the regional strategies and the current and future IFAD loan portfolio; (c) the institution(s) identified should have competence

B. Allocation of Programme Funds

Box 1: Twenty-two Years of AR/TAG Operations

- **Total allocation.** From 1979 to 2001 a total of 199 AR/TAGs were approved for an overall sum of USD 171.5 million. Of these, 39 are ongoing.
- **Importance in the TAG programme.** From 1979 to 2001 AR/TAGs accounted for 37% of total IFAD grant funds. From a peak of 71% in 1979-83, the share declined to 29% in 1997-2001.
- **Annual funding** varied from USD 14 million in 1981 to below USD 2 million in 1992.
- **The size of individual AR/TAGs** has varied from USD 150 000 to USD 4 million, with an overall average size of USD 1.35 million. Most TAGs have a three-year implementation period.
- **Regional profile**. Almost all AR/TAGs are regional and multicountry. About 3% have been classified as global. The highest share of funds has been granted for activities in Africa and the Near East and North Africa (NENA) (41% and 29%) while Asia's and Latin America's shares averaged 17% and 10% respectively.
- **Institutional profile**. AR/TAGs have been granted to 35 international agricultural research centres: 16 are CGIAR and 19 non-CGIAR centres. CGIAR centres received 62% of total grants.
- **Distribution of funds**. The bulk of programme funding has been concentrated among relatively few institutions, both among CGIAR (38% of the centres have been allocated 71% of the funds) and non-CGIAR centres (32% of the centres have received 82% of the funds).
- Two CGIAR centres, IITA and ICARDA, have received the largest number of grants and the largest allocation of funds per centre (25 and 21 grants respectively, and together 35% of CGIAR grant funding). Among non-CGIAR centres, ICIPE and ACSAD have dominated (16 and 14 grants respectively, and together 44% of non-CGIAR funding).
- **Sectoral distribution** of AR/TAGs has favoured crops and cropping-system research (48%). This emphasis has declined in recent years, with a parallel rise in the importance of research in livestock, natural resources and pest management. In the period 1997-2001, crops, livestock and natural resource management (NRM) absorbed 30%, 19% and 15% of AR funds respectively.
- **Type of research supported[6].** There has been a shift from the earlier emphasis on mainly applied and some strategic research to downstream adaptive research and technology validation.
- **Management**. The Technical Advisory Division (PT) has managed most AR/TAGs (87%). Traditionally, PT was the programme's exclusive manager. Since April 1997 a decentralized approach is used, whereby regional divisions also manage TAGs, and allocation of TAG resources among divisions is on a fully competitive basis. As of December 2001, the regional divisions were managing 16 grants out of 39 ongoing, even though PT continues to maintain the coordination function.
- **Phasing**. About half of the research funded has consisted of interlinked grants or 'phases'.

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and comparative advantage in the activities proposed; and (d) the technical approach should be feasible and should have potential to deliver medium-term benefits to the rural poor.

6 Research typologies are defined as follows: *strategic research* – quest for the solution of specific research problems; *applied research* – application of scientific knowledge to the solution of a practical problem; *adaptive research* – development of technological packages using solutions to practical problems from applied research; *technology validation* – on-farm trials to test applicability of technological packages to specific locations/situations.

IV. EVALUATION FINDINGS

A. Research Priorities of the Programme

8. The evaluation found large differences of opinion about the research priorities of the programme. These are evident not only among grantee institutions, but also within IFAD. At present, technical, methodological, institution building and, to a much smaller extent, policy priorities appear to coexist. A clear policy and strategic framework, pinpointing the priorities, is still to be provided. Selection of TAGs for screening seems to occur on a case-by-case basis, with chance and personal factors still playing a role. Some grants are clearly supply driven and others are initiated by IFAD. In many cases an interaction takes place, and often a reconciliation between the research agenda pursued by the applicant institute and that of IFAD. Within IFAD, there are clear differences among regional divisions in agricultural technology and research priorities, some matching the existing AR/TAG selection criteria better than others[7]. At the grantee level, IARCs claim that the TAG priority-setting process has usually involved consultation with farmers, as well as diagnostic surveys with a multidisciplinary team, but such evidence is often lacking in reports.

B. Trends in Approach

9. Positive trends are evident in the evolving research approach of the programme from 1979 to the present. The grants approved show increasing concern for poverty, environmental sustainability and major production systems in arid and semi-arid regions of the world. This trend has been gradual and the 1997 guidelines for AR/TAGs served to legitimize these trends rather than breaking new ground.

Box 2. Trends in the Research Approach 1979-2001

- **Greater focus on technology appropriate to poorer farmers,** taking their resource constraints, experience and preferences into account to improve adoption potential.
- **Shift from a commodity focus, particularly in crop research, to a systems approach**.
- **Downstream shift to technology validation and dissemination**. Some newer TAGs are actually testing dissemination strategies and preparing extension materials.
- **Increasingly active involvement of farmers in the research process**. Farmer-participatory research has increasingly become part of downstream research, and results are being taken into account. However, scope still exists for stronger engagement of farmers and community-based organizations (CBOs) in setting research priorities.
- **Increase in multidisciplinary and multi-institutional approaches**. Newer TAGs are doing a better job of integrating social research with technological components and widening institutional partnership. Economic and policy research remains weaker. Initial cost-benefit analysis of alternative research options is rarely performed, nor are policy issues affecting research sufficiently assessed.
- **Increasing attention to gender issues.** Newer TAGs seem to be better integrating gender issues into agricultural production and post-harvest activities and including women in participatory on-farm testing and technology selection decisions.

C. Research Design

10. The large majority of reviewed AR/TAG Executive Board proposals are well designed in terms of rationale, objectives, description of main components and core research. Recently, a few grant design documents have attempted a logical framework presentation. The most common weaknesses are: (i) overambitious design in terms of numbers of countries and objectives; (ii) lack of reference to relevant earlier TAGs; (iii) absence of information on implementation capacity, particularly regarding national partners; (iv) inadequate or missing description of monitoring and evaluation (M&E)

[7] At the time of the writing of this report, two regional divisions' research strategies were available for review: Western and Central Africa, and Near East and North Africa.

arrangements; and (v) lack of clear guidelines for impact assessment. Proposals of CGIAR applicants were usually of a better quality than those of non-CGIAR. About two thirds of the TAGs reviewed were found to have made fairly important changes in the TAG design during implementation, only some of which have a clear justification. These appear to have occurred because of an incomplete match between the IFAD research agenda and the institutional agenda of the grantee.

D. Relevance of the Research

11. The objectives of TAGs, as stated in Executive Board proposals, have been relevant to the needs of the rural poor, to the AR/TAG programme, and to IFAD regional priorities and strategies. Some 86% of these proposals had stated goals and objectives with clear poverty relevance. But the poverty relevance of outputs is much lower, in part because of above-noted changes in focus during implementation. The documents reviewed suggest that only about 60% of completed technology outputs can be described as clearly appropriate to the rural poor. The gap between the relevance of objectives and the relevance of outputs is mostly caused by an insufficient attention to the livelihoods and constraints of the poor and to insufficient farmer participation in determining research priorities. However, the evaluation noted a marked improvement in this aspect over the years through the increasing integration of socio-economic research and farmer participation. Implementation capacity constraints at the national level have also been a cause.

E. Research Partnerships

12. NARS8, particularly government agricultural research institutions (GARIs), remain the main research partners of IARCs. The institutional survey results show that this is more the case with CGIAR than with non-CGIAR centres (100% for the first group versus 56% for the second). With few exceptions, in most countries this partnership is often strained by financial and capacity constraints of NARS. They have little cofinancing available for implementing project activities and are often short of human resources. IARCs also noted GARI's capacity weaknesses, inadequate reporting and accounting performance, poor facilities, lack of long-term plans, and limited social science expertise. These weaknesses have hampered research implementation.

13. CGIAR centres were found to have established more working relations with non-governmental organizations (NGOs) and extension systems than the non-CGIAR centres. Overall, NGO partnerships are increasing, particularly for facilitating farmer involvement in on-farm research and for technology dissemination, but CBOs appear to be less involved. NGOs were praised as partners. But there is far less evidence of active NGO partnership in the TAG reports than is claimed in the survey responses. Most research tries to work with extension systems, which occasionally benefited from grants and training activities. These systems also collaborated in research, particularly farmer-participatory field testing. However, extension partners were found to be underfinanced, with increasing problems of staffing, incentives and mobility. Overall, the focus on multidisciplinary research has led to a search for new partners that can provide socio-economic research expertise (e.g. universities, social science research institutes and NGOs). The emergence of the private sector as a strong player in the field of agricultural research calls for innovative forms of partnership that safeguard the interests of the poor. The evaluation also demonstrates that there are cross-fertilization benefits in promoting cooperation between NARS themselves in multicountry TAGs.

14. IFAD was instrumental in promoting steering committees (SCs) as a mechanism for TAG governance. Both the survey and report reviews indicate that they are now used by a large majority of TAGs, often in combination with workshops9. CGIAR centres appear to have an almost unanimous belief in the value of SCs for purposes of review, planning coordination, monitoring, ensuring transparency and developing a sense of ownership of the activity. IFAD has almost always been a

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[8] NARS refer to all governmental and non-governmental organizations involved in agricultural and related research at the national level.

[9] But SCs are used far less frequently by non-CGIAR centres (56% compared to 93% for CGIAR).

member of the SCs of its supported research, together with other implementation partners. Overall, the SC mechanism has worked well for field coordination and management of AR/TAGs.

F. Grant Linkages with IFAD Loan Projects

15. Linking the AR grant portfolio to the loan portfolio, to enhance IFAD's investment projects, has always been central to the AR/TAG programme. IFAD loan projects were expected to use technology developed by the AR/TAGs to increase their impact on rural poverty reduction. The evaluation found that such direct linkage is more likely to happen with downstream, farmer-participatory research, which produces poverty-appropriate technology of visible benefit to and attraction for farmers. Longer-term research will usually have a time-lagged and indirect input. Some IARC respondents to the institutional survey understood the concept of linkages in a much broader sense, to include activities that would set the stage for such linkages to eventually take place (e.g. on-farm technology testing in an IFAD project area or IARC staff joining an IFAD project mission).

16. Fully 78% of Executive Board proposals for AR/TAGs named specific IFAD loan projects that "would benefit" (or similar wording) from the TAG. Forward, parallel and backward types of linkage expectations were found. However, very rarely were linkages with IFAD loans mentioned in the original IARC proposals. In a few cases, memoranda of agreement were attached to the Board proposal providing details of such linkages.

17. Evidence of *achievement* of linkages was much lower. Among the reviewed TAGs that had anticipated linkages, only 46% had evidence of any form of linkage, even when considerable latitude of definition was allowed (i.e. only 36% of the TAGs reviewed could be considered successful in achieving linkages). Where multiple phases were involved, linkages were seldom achieved during the first phase. Research reports, including those of supervision, rarely dealt with the question.

Box 3. Reasons for Weak Linkages of AR/TAGs with IFAD Projects

- Absence of joint setting of loan and grant priorities;
- lack of synchronization between grant and loan projects, often caused by start-up delays of the research financed by the TAG;
- limited agro-ecological and geographical overlap between grant and loan projects;
- poor information sharing between IFAD and IARC on technology needs in the ongoing IFAD portfolio and the project pipeline;
- lack of knowledge on the part of IFAD staff in the regional divisions of the technology output of TAGs and its potential use in projects;
- lack of directly usable outputs by the TAG that could be scaled up under loan projects;
- IARCs expect the loan project to pay for costs involved in any collaboration;
- difficulty in identifying the technology constraints and needs of loan projects in a geographical region that could be addressed through an AR/TAG;
- insufficient appreciation of the rationale for and potential of grant and loan linkages; and
- different cycles and procedures for grant and loan project design and approval that do not recognize or reward grant and loan interaction.

G. Achievements of Research Objectives

1. Overview of Achievements and Constraints

18. **Achievements**. In line with programme objectives, the achievements of the agricultural research TAGs are not restricted to technology outputs. Nevertheless, the majority of TAGs reviewed stated their objectives in terms of technology development. The evaluation found that TAGs performed less well in terms of achievement of stated objectives than of design or relevance. About 60% were found to have achieved *most or a good part* of their objectives, about one third achieved some of their objectives and 10% achieved little. CGIAR-implemented TAGs were much more likely to have satisfactory or higher

performance than the non-CGIAR ones[10]. There were no clear regional trends. Although some IARCs appeared less effective than others, definite judgement on institutional performance could not be made on the basis of the sample, which does not include all TAGs implemented by all IARCs. In some instances, there were major differences in performance between different TAGs implemented by the same grantee.

19. Research time horizon and other constraints. From its inception, the AR/TAG programme has stressed achievement of outputs over the short to medium term. During implementation this has not always been the case. In the early stages of the programme, multiphased grants were more common, with IFAD supporting several longer-term research programmes. Even in later stages, delays in producing research output in the short term (three years) have also been observed, requiring follow-up TAGs. A number of explanations can be given. Agricultural research is, inherently, a long-term process. In addition, production systems of smallholders in unfavourable environments, for example in rainfed areas of Asia, Africa and the NENA region, are by nature complex and difficult to address. Livestock, agroforestry, and some other types of research supported by the programme need a longer time horizon because of life-cycle factors. Where NARS are weak, more time is needed initially for capacity-building. Farmer-participatory research also takes extra time but is essential for generating appropriate outputs. These factors often make the search for technically, environmentally, socially and economically sustainable production technologies a medium-to-long-term task.

20. The above arguments notwithstanding, producing short-term output proved feasible when research projects supported a slice of an established research programme, building on accumulated knowledge from past research. Such TAGs must therefore carefully choose the entry point for IFAD support, making sure that it is towards the end of the research programme, preferably at the technology validation stage. However, research restricted to this shorter-term focus can be restricted in terms of innovativeness and relevance as well. There could be, therefore, a trade-off in the choice between a short-term approach to produce immediately usable output and longer-term research. Better correspondence was observed between short-term output expectations and research approaches in recent years, due to the increased downstream nature of IFAD support. Other constraints faced by TAGs in the achievement of objectives include: (i) over-ambitious technology objectives at the design stage; (ii) inadequate capacity (especially among NARS); (iii) funding shortfalls (e.g. where cofinancing did not materialize, costs were underestimated, or inadequately allocated); (iv) climatic factors that delayed technology testing and therefore completion of outputs; (v) difficulties in partnering with NGOs and CBOs or establishing linkages with extension systems.

2. Technology Outputs of Different Types of Research

21. Short-to-medium-term crop research on established crops. A good part of the programme-financed crop research has been short or medium term, building on earlier research and products in established food crops, especially in grain crops such as rice, wheat, maize and grain legumes. Frequently such research uses new and improved varieties to develop and refine location-specific technological packages and associated management practices. Sometimes this research has built on indigenous knowledge and technology rather than, or in addition to, building on scientific research. This has usually resulted in small improvements in existing crop and livestock management practices (such as planting time, spacing arrangements, integrated pest management (IPM)), but which can be easily adoptable and result in significant improvements in subsistence crops for smallholders.

22. Longer-term crop research on established crops. The programme also financed long-term research (multiphase, multiyear) for established crops, as in the case of support for rainfed rice by IRRI and WARDA and for the faba bean by ICARDA. In the latter case (TAG 1-ICARDA), the first two phases of research generated new varieties and some component technologies (i.e. weed control, fertilizer application, pest management, with research conducted on-station). Later, some integrated production packages were developed in farmers' fields. The third phase developed linkages with development

[10] Differences in reporting quality may also be a factor.

projects to accelerate dissemination. The ICARDA faba bean research (the first research grant in IFAD) was a pioneering grant for multidisciplinary and participatory research, with many technology outputs and positive nutritional impact on the poor. Its main weakness from IFAD's perspective was that technology outputs generated were too input-intensive to be used by the poorest farmers.

23. **Research on 'neglected' crops**. IFAD has taken a lead in mobilizing interest in and donor support for research on some important 'neglected' food crops of the poor, with notable success, especially in Africa. Research on plantain, bamboo and rattan, and cassava are examples. For instance, cassava research has been supported over the entire lifespan of the AR/TAG programme, with a range of technology products generated along the way. These have included: improved cassava varieties, highly cost-effective biological control technology of two major cassava pests, transfer of improved cassava varieties from Africa to Latin America, and development of a global cassava policy. The impact of long-term involvement in the cassava programme on the rural poor in Africa has been remarkable (see Box 6).

24. **Integrated crop pest-management research**. Since the early 1990s, the AR/TAG programme has financed several TAGs for development of IPM technologies in Asia, Africa and Latin America. Some of these have generated a range of outputs, including adapted new varieties, IPM technology, crop management practices, and methodological adaptations of the farmer-field-school methodology. The sample TAGs reviewed on IPM research suggest on average a four-to-five-year research period for generating outputs. Resolving production and legal issues as well as collective action at the community level can take a longer time and need more initial attention under IPM TAGs.

25. Livestock research. Four important areas of TAG livestock research have been supported: (i) improvement of quality and quantity of livestock feed; (ii) breed improvement and reproduction; (iii) pest control and disease management (development of control measures and surveillance systems); and (iv) crop/livestock integration. Most of the livestock feed-related research has focused on developing low-cost alternative feeding strategies, improving quality of crop residues and promoting forage, especially legume forage, in rotation[11]. Much of this research has revived old technologies that were 'gathering dust on the shelf,' adapting them to the needs of smallholders. TAG-supported livestock research produced some worthwhile output despite the acknowledged challenges of livestock as compared to crop research in semi-arid areas. Research on livestock faces diverse and complex constraints related to the longer life cycle of animals, the intricate role of livestock in the livelihood strategies of the poor, its linkage with natural resource degradation and the specific role played by poor rural women in the livestock subsector. The evaluation noted the increasingly better integration of socio-economic studies into recent livestock research and the firmer rooting of this research at the rural community level. This was associated with progressive improvement in the quality of research output in livestock TAGs.

26. Research on commercial insects. Since 1995 IFAD has provided support to ICIPE's Commercial Insect Unit (TAGs 308 and 491). Some of this research has built on traditional knowledge and practice to generate improved technologies for sericulture and apiculture for African farmers. It is one of the few TAG research areas that have been effective in generating post-harvest technologies as well as production technologies.

27. **Fisheries research**. These TAGs have been limited to inland fish farming, primarily in Bangladesh. This cluster of grants to ICLARM shows a clear learning curve in understanding the relevance of technology to poverty, as well as in linking grants to IFAD loan projects.

28. **Research on NRM**. This highly relevant body of research has focused on generating technology outputs for water, soil and agroforestry, mainly in NENA and West Africa. The specific outputs have included technologies, strategies and policies for conserving water and for the management and

[11] IFAD, Assessing the Impact of the IFAD TAG Programme on Agricultural Research and Technology Transfer in the NENA Region 1980-1998 – working document, November 2001.

rehabilitation of pasture and rangeland. Agroforestry research has been comparatively less successful to date in completing appropriate technology outputs – one reason being that it requires a long lead-time, at least five years or more, and skills for intensive multidisciplinary work at the community level, which not all IARCs possess. Recently designed agroforestry TAGs have integrated past lessons learned, and serious efforts are being undertaken by IARCs to widen research partnership and integrate socio-economic issues at community levels.

Box 4. Lessons on the Generation of Technology Outputs

Overall the programme has been reasonably effective in achieving the technology generation objectives. Crop and cropping-system research began early in the programme and benefited from accumulated knowledge and lessons. Livestock and NRM research face particularly difficult challenges in the context of poor rural communities, but notable improvement has been observed in tackling these issues in the more recent TAGs. Lessons to be noted are:

- A gap can exist between the objectives and challenges of the research and the capacity to carry out that research effectively. TAG design should address such gaps and introduce measures to address them.
- The desire for grantee institutions to conduct the research *they* want, as well as what IFAD wants, has resulted in a shift or a dual focus during implementation of some TAGs.
- IFAD's focus on short-to-medium-term outputs can work in the case of established crops with ongoing programmes if an appropriate entry point is identified for TAG-funded downstream research.
- Longer-term innovative research is needed in fields critical for the poor (e.g. water harvesting, NRM, neglected crops, higher-nutrition food crops) and can include some strategic/applied research as well, provided that potential linkages with the rural poor and IFAD projects can be established.
- A longer time frame is also needed when research involves community-level collective action and combines various disciplines, e.g. NRM, IPM and livestock.
- The three-year implementation period can result in incomplete technology outputs and undermines impact achievement and assessment for many TAGs.

H. Poverty Impact of Agricultural Research

29. Agricultural research can have a major impact on poverty; the difficulty lies in proving such impact on a case-by-case basis. In the case of the AR/TAG programme, this is made even more difficult by a lack of relevant data. In the review sample, evaluations were available for less than a quarter of the sample TAGs12. The survey results argue that more studies have actually been done, suggesting missing reports or delayed impact evaluations (after TAG completion). Time and budget limitations and lack of clarity among grantees on what kind of evaluation IFAD expects have been some constraints. Two main approaches were used by TAGs for impact assessment: technology adoption studies and economic impact assessment, which measures economic rates of return of research. Very few TAGs were able to go beyond these definitions to estimate the research impact on rural poverty.

30. The available data confirm that attribution of poverty impact to agricultural research is complex and based on a number of assumptions. It occurs indirectly, through the impact of research on agricultural productivity and through the effect of productivity changes, on a variety of other economic and social aspects at micro, sectoral and macro levels. The issues are as follows:

[12] Some IARCs emphasize impact assessment more than others. ICARDA alone has produced more than six impact-assessment studies on its received grants.

Box 5. Difficulties in Assessing the Poverty Impact of Agricultural Research

- The link between improved technology, increases in productivity, and poverty reduction has multiple causal or conditioning factors, of which agricultural research is only one.
- It should not be assumed that adoption of technology is equivalent to benefits, *especially* in the case of the poor. Findings show that poorer farmers often do not have the needed asset base to make the best use of new technologies, *even if they adopt them.*
- The multiple livelihoods of the poor complicate the attribution problem. Improvement in one, such as own-farm production, if accompanied by the need to invest more time or inconvenient time, can result in loss in another, such as wage income.
- Gradual erosion and reversals can occur in impact over time due to changes in adopted practices, loss in effectiveness of the technology, capture of benefits by the better off, or market factors.
- Attribution is particularly difficult to verify in the case of small contributions.

31. To compensate for the lack of data, the evaluation adopted a methodology for assessing the potential for poverty impact based on "appropriate products/available dissemination mechanisms". It defines TAGs as having poverty impact potential if they can meet the following four impact conditions or proxy indicators of impact:

- Impact condition # 1: usable technology outputs have been completed.
- Impact condition # 2: outputs are appropriate to resource poor farmers.
- Impact condition # 3: there are no major constraints to dissemination.
- Impact condition # 4: linkages have been established with a system for dissemination.

32. The evaluation checked the above-mentioned conditions as a proxy for poverty-reduction potential in the reviewed sample. Less than one third of the reviewed grants fulfilled these conditions. However, the evaluation would like to note that this figure has to be interpreted with care as only a rough proxy indicator. TAGs were more likely to meet the second condition – that of appropriate technology – if farmers had participated in the research. Notwithstanding the above findings, there are several cases of research TAGs in which the poverty impact has been established unambiguously (e.g. research on cassava, faba beans, rice, potatoes, plantain and some others).

33. Recognizing this scarcity of impact data and the methodological lacunae in the field, in recent years IFAD has emphasized impact achievement and assessment in its support to agricultural research. It has contributed to the development of impact evaluation methodologies that have become an important input for the CGIAR Special Programme on Impact through the Standing Panel for Impact Evaluation. IFAD is supporting this initiative to develop methods that identify the necessary conditions for favourable impact of agricultural research on the poor and determine the best methods for assessing this impact[13].

[13] Fourteen country case studies will be completed by April 2003, and a paper synthesizing the preliminary results of the case studies is in preparation. A major feature of these studies is that they go beyond conventional treatment of poverty as solely a matter of income, expenditure, food intake or nutritional status. Drawing on participatory poverty assessments, the studies look at the vulnerability of poor people to various trends and shocks and use the sustainable livelihood framework, thus paying attention to a wide range of capital assets.

Box 6. Poverty Impact of Agricultural Research: Biological Control of the Cassava Mealybug (TAGs 36, 136-IITA)

The TAG research for biological control of the cassava mealybug (CMB) is a good illustration of the potential impact of agricultural research. Cassava is the staple crop of 200 million Africans, primarily the poor. In the 1970s a new pest, the CMB, began to devastate cassava fields throughout Africa and threaten the food security of millions. TAG 36-IITA supported strategic and applied research that identified a natural enemy of the CMB – a tiny wasp from Paraguay – as the control solution. After careful study, it was disseminated in Africa in the 1980s. Thus the solution did not involve the use of expensive pesticide inputs by the poor, but was essentially 'free'. Under two phases of TAG 136, coverage was expanded throughout cassava-producing countries in Africa with excellent results. By 1994, some USD 27 million had been spent on CMB control. The benefits to poor farmers whose fields had been saved was estimated at USD 4.5 billion, or more than 160 times the cost of the control measures[14]. Others have estimated the benefit-cost ratio at 149:1.

Some of the factors that lead to the successful impact of this research:

- early identification of the pest threat;
- sensitization of governments concerned to the seriousness of the threat, resulting in commitment to control;
- long-term grant support from IFAD, coupled with additional support from loans and other donors;
- existence of good institutional capacity and technical expertise at IITA;
- additional technical support from a consortium of international and national institutions;
- ability of IFAD to identify gaps in research capabilities and makes funds available to eliminate them;
- efficient backstopping and flow of funds from IFAD to IITA; and
- low costs for the poor.

The success of this programme has helped galvanize support for agricultural research, particularly in the area of biological control.

I. Institutional and Policy Impact of Agricultural Research

34. The evaluation recognizes the important policy and advocacy role performed by IFAD through the AR/TAG programme. Together with other committed donors, IFAD has strongly advocated the poverty focus of the CGIAR system, became a founding member of the Global Forum on Agricultural Research (GFAR), and is playing an important role in the CGIAR Special Programme for Impact Assessment (see paragraph 33).

35. The role of the programme in promoting pro-poor research became particularly clear through the institutional survey and visits. IFAD efforts in this respect succeeded in sharpening the focus on poverty-related research in the work programme of the CGIAR system. In recognition of this role, in 2002 IFAD was invited to become an official co-sponsor of the system. It has also taken the lead in funding certain areas of poverty research (e.g. neglected crops) and has catalyzed other donor support. At the regional or national levels, about one third of TAGs in the sample had important policy or strategy objectives. Many of these actually achieved some degree of policy impact. Some newer TAGs are explicitly building in activities for policy dialogue and influence.

36. IFAD's advocacy role in the creation of GFAR in 1996 is worth noting. The Fund was a lead agency in the global effort that led to its establishment, and chairs its support group to mobilize the international donor community around the GFAR agenda. GFAR aims at facilitating cost-effective

[14] Main source: L. D. Swindale, *Globalization of Agricultural Research: A Case Study of the Control of the Cassava Mealybug in Africa,* available at www.worldbank.org.

partnerships and strategic alliances in research to reduce poverty and food insecurity and to conserve and manage biodiversity and natural resources. Main aspects of the GFAR agenda are: demand-driven research implemented through equal partnerships among stakeholders; strong farmer perspectives in setting the research agenda, taking into account the regional heterogeneity of farming systems; and effective involvement of the intended users (poor farmers) in research design and technology diffusion.

37. The AR/TAG programme has also had a positive impact on institutional capacity, at least in the short term and particularly at the NARS level. Almost all IFAD-financed TAGs have been engaged in NARS capacity-building, particularly for GARIs[15]. The evaluation findings suggest that at least 50% have achieved a significant impact at this level, with most of the remaining TAGs also having a positive impact. Capacity-building at the national level has consisted of short-term training on research through workshops or short, focused courses on technical subjects and methodological topics (e.g. impact assessment, farmer-participatory research and gender issues). Sometimes extension staff have been trained as well as researchers[16].

38. However, several respondents to the institutional survey highlighted the difficulty of achieving field-level impact from training because of the serious financial and human resource constraints of the large majority of NARS. There are a number of factors involved, such as the high level of turnover in some countries of national staff (including those trained by TAGs), and the lack of equipment and of travel budgets for field research. Other types of capacity-building activities have included financing of higher degrees for researchers; provision of laboratory equipment or other essential capital investments needed for research.

J. Knowledge Impact of Agricultural Research

39. The review found that almost all TAGs had generated lessons worth disseminating. Actual dissemination of those lessons, and therefore impact on knowledge diffusion, still needs strengthening. Often the knowledge generated by TAGs has only been disseminated to a small group of 'network' researchers and has not reached the larger development community, farmers or a wider circle of IFAD staff. Technical advisory notes (TANs) are potentially very useful tools for the dissemination of TAG research findings to a wider development audience, both inside and outside IFAD. Since 1998 some 55 TANs have been produced. Of these, 15-20 are ready for posting on the IFAD TAG subsite. TANs are short and user-friendly, and PT is taking measures to increase both the number and quality. Other methods used by TAGs to disseminate information include scientific journals, conferences and sourcebooks, dissemination through networks[17] and through IARC information centres.

K. Programme Management

40. Management of the AR/TAG programme has undergone major improvements in recent years. Historically, the programme was entirely managed by IFAD/PT. In earlier years grant selection decisions were centralized, with little involvement of regional divisions. More recently there has been a conscious effort to address this situation, and to involve regional staff in TAG initiation and management, in order to ensure that financed research is in line with regional strategies and research priorities, and to enhance linkages with IFAD projects[18]. Steps have included: (i) the PD guidelines for AR/TAG, implemented since 1998, which introduced, inter alia, the possibility of TAG initiation and

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[15] The need for such capacity-building has varied among regions and countries.

[16] Some TAGs have trained more than 100 scientists (in one case, 500).

[17] About a quarter of the agricultural research TAGs have established networks of one kind or another, usually of researchers and, much less frequently, mixed networks that include researchers, extension agents, IFAD project staff and occasionally farmer association representatives.

[18] PT maintains the coordination function. This includes: management of the grants pipeline (processing and reviewing of all grants); Executive Board document preparation and Board presentation; implementation progress reports to the Assistant President/PD and external reporting through the *IFAD Annual Report* and to various international research forums; liaison with other IFAD divisions on TAG-related matters; and implementation follow-up with TAG task managers in PT and the regional divisions.

management by regional divisions; (ii) new TAG screening criteria and procedures, developed by an in-house task force in 2000, with immediate application; (iii) the institution of TANs to generate and disseminate learning from the programme, which have been very well received by IARCs and other partners; and (iv) annual reviews of ongoing grants, starting in 1999, which perform important functions, e.g. feedback to grant recipients and reporting to IFAD's Executive Board.

41. Despite the significant progress noted above, there is still room to enhance efficiency. Overall, IARCs commended IFAD's management of TAGs and the professionalism of the staff involved. While fully acknowledging improvements introduced by IFAD over the years, they and IFAD staff highlighted the following areas where further improvement can be made: (i) streamlining and systematizing the approval processes to increase efficiency; (ii) providing more comprehensive guidelines for progress and completion reporting, including a unified reporting format and some guidance on expected evaluation; (iii) speeding up disbursement processes; and (iv) providing practical means to improve linkages of TAGs with IFAD investment projects. Supervision of TAGs continues to be variable both in frequency and quality. Funding constraints are a major reason. One solution used by several TAGs has been to include funding under individual TAGs for supervision purposes, but difference of opinion exists on this practice.

V. MAIN CONCLUSIONS AND RECOMMENDATIONS

A. Overall Performance of the Programme

42. The AR/TAG programme has now been operating for more than two decades. During that time, IFAD has played a strong advocacy role in redirecting the focus of the CGIAR system towards more poverty-focused research, taken the lead in opening up new research areas, and continued to play a pro-poor advocacy role in a number of international forums related to agricultural research. The programme has achieved several well-known successes in agricultural research. There have also been some less-publicized failures. The majority of TAGs fall somewhere between these two extremes. TAGs are usually well designed, and overall they have been reasonably effective in achieving stated objectives. Due to unavailability of impact assessment studies, the impact of most TAGs on poverty cannot be rigorously established. TAG impact on establishing effective partnership for research and strengthening national research institutions appears to be highly positive, though sustainability cannot be rigorously verified.

43. Overall, the programme remains relevant to the IFAD poverty mandate and its current SF. It has progressively focused on enabling the rural poor to access appropriate technology for improving their livelihood and on the technical and socio-economic needs of those living in ecologically fragile environments. Better use of farmer-participatory research and multidisciplinary approaches has helped, but more can be done to involve farmers and CBOs in setting research priorities. As the programme has increasingly included new research areas, it has become too diffuse in its focus. Supply factors and individual interests still play too large a part, and IFAD has yet to provide coherent institutional direction for the programme and better means to link it with its loan projects.

44. The overall programme impact is clearest in terms of institutional capacity-building, both at the IARC and NARS levels. Its poverty impact is least easily pinpointed, in part because linkages with IFAD loan projects have rarely succeeded and because adequate impact evaluations are not systematically undertaken. Impact on knowledge is generally agreed to be much weaker than it could and should be, and yet is probably the easiest to improve. TANs are a good step in that direction. Room for improvement exists with respect to the programme's efficiency, in particular proposal review procedures and implementation. Traditionally, the programme focus has been shared between CGIAR and non-CGIAR centres, while distribution of grant resources between institutions within these two categories has become highly uneven. Programme efficiency and systematization of procedures can be further improved.

B. Conclusions on Programme Policy, Strategy and Procedures

45. **The AR/TAG programme needs a clear strategy, priorities and better focus.** While grant approval processes have received considerable attention, the technical or research subject matter priorities have not. The programme is attempting to cover too many areas within a framework of zero growth in resources. In addition, basic issues, such as the main goal and objectives of the programme, research priorities, longer versus short-to-medium term research, and upstream versus downstream focus are still not quite clear. Some regional divisions have elaborated regional research strategies that guide their own TAG selection, but these are not positioned in a well-defined institutional policy/strategy of support for agricultural research, and will benefit from further focus and prioritization. A ground-level policy and strategy discussion is needed to determine what IFAD research priorities are, given the new strategic framework, how these can be linked to regional priorities, and how the programme can address them effectively.

46. The AR/TAG programme needs to establish a niche in innovative research for poverty reduction. Despite emphasis in all programme documents, including the 1997 guidelines, on "the need to develop through applied and adaptive research innovative and effective means to eradicate rural poverty", innovation has not been a main criterion in assessing grant proposals. The SF and the recent document, Evaluation of IFAD's Capacity as a Promoter of Replicable Innovations, highlighted IFAD's potential catalytic role as an innovator. There is a need for the programme to carve out a niche in the generation of an innovative research agenda. Possible areas include: no-tillage farming; water harvesting; higher-nutrition food crops for the poor; new research partnerships that include emerging actors in the field of agricultural research (e.g. the private sector and NGOs); more-effective integration of the poor in the setting of research priorities and in implementation; and similar topics of relevance to IFAD investment projects.

47. **The consistency between resource allocation in the AR/TAG programme and that of IFAD loans should be increased.** Ideally, the allocation of resources in the programme should be consistent in thematic terms with the planned allocation of resources in the Fund's loan portfolio. This is important if grants are to address research issues identified by operations and to link with future projects. Such planning is not currently done. Synchronization between TAG and loan programmes (the former preceding the latter chronologically) should be done on the basis of regional and location-specific identification of research needs and the tailoring of AR/TAG programme priority areas accordingly.

48. **Programme procedures need strengthening**. TAG procedures need to be more efficient. A series of positive moves in recent years culminated in the implementation, in May 2000, of the AR/TAG screening criteria. These have made programme procedures more transparent and participatory. However, the programme needs to further enhance selection rigour and efficiency. Proposal selection criteria and processing procedures need revisiting and further systematization. IARCs have asked for more guidance at all stages.

49. **Reporting should be more appropriate to IFAD concerns.** Implementation completion reports do not appear to be prepared consistently. Nor are progress, completion or supervision reports comparable in terms of topics covered and adequacy. Impact assessment is not systematically performed. Problems faced during implementation and solutions proposed are not sufficiently discussed, and yet these are among the most informative parts of the report for IFAD, and also for future TANs. Overall, there is a tendency to produce either publicity documents or technical dissertations. Linkages with IFAD loan projects are usually not covered.

C. Conclusions on the Research Funded

50. **AR/TAG grants show wide variation in quality**. There are some very well-conceived and executed TAGs and some poor ones, with CGIAR institutes performing better overall in quality of proposals, performance and impact. Research proposals need to give more attention to capacity for implementation both at IARC and NARS levels. This also raises the issue of whether IFAD should give

priority to the better-performing IARCs and NARS, that is those with a good track-record, and phase out support to those that are consistently low performers.

51. Linkages between TAGs and IFAD loan projects have been difficult to achieve. In the evaluation assessment, this is the weakest aspect of the programme. Limited forward planning, lack of joint grant/loan coordination, unclear research priorities, difficulties in identifying technology needs and delays are frequent causes. Past experience has provided some useful lessons on how to better achieve linkages. There are some good models among the TAGs. More could be done at the TAG proposal and start-up stages to lay a better basis for linkages, particularly by IFAD staff. Loan projects can play a more effective role in enhancing such linkages. They should not be viewed only as a platform for dissemination of TAG-financed research output, but can also provide the field context in which downstream research should be designed and adapted. Encouraging cooperation and exchange of knowledge among country portfolio managers (CPMs), IFAD/PT technical advisers, grant managers and project field staff is essential to the fulfillment of this role. Supervision and reporting have not paid adequate attention to the linkage question.

52. There has been a general trend in the programme towards more multidisciplinary, multipartner and participatory research, which has been accelerated in recent years. This is in line with IFAD's SF and priorities, and ensures better impact of research on poverty. Although social aspects are becoming increasingly well integrated, economic and policy issues need more attention. Cost-benefit analysis, initial policy-constraint analysis and policy dialogue need greater focus in the future. Scope for improvement exists in increasing the participation of farmers and CBOs in determining research priorities and in providing insights into traditional practices and innovations. CGIAR and some non-CGIAR centres are gradually developing the necessary capacities.

53. **Some TAG projects are moving beyond technology validation to technology dissemination activities.** While in some ways, this is desirable, it also raises strategic issues. At the IFAD level, there is danger of overlap between AR/TAG focus and activities and those of the IFAD/NGO Extended Cooperation Programme and, indeed, those of the IFAD loan programme. Replacing national research and extension systems in some of their activities is another danger. At the level of IARCs, there is the question of value added and the match between such research and the skills of grant recipients.

54. **There is a danger of research achievements and impact being undermined by the narrow time frame.** The very large majority of research activities financed have a duration of three years, even though IFAD Executive Board documents allow three to five. Extensions, funding of subsequent phases and sometimes small grants are occasionally used to 'patch up' grant projects in order to allow them to achieve their objectives. This approach is inefficient and is advantageous neither to the grantees nor to IFAD. Apart from capacity constraints, it suggests that research activities, and particularly the newer impact-oriented ones, need a longer implementation period than the usual three years. A longer time frame of four to five years would result in better research, particularly where life cycles are long or considerable initial capacity-building or background social research is needed. It would also permit a realistic assessment of impact.

55. **The programme has made a good contribution to capacity-building, particularly in participatory methodologies and poverty-oriented research at the national level.** But in spite of efforts made to help NARS, there are a number of constraints on longer-term impact: the generally weak financial situation of NARS and staff attrition and rotation. IFAD needs to better recognize the implications of these constraints. If capacity-building is to be a major objective of the programme, then adequate time and funding should be allowed for this purpose under TAGs. If production of output is the overriding goal, then the programme should be more selective of national partners, favouring those with existing capacity.

56. **Too little is known about the poverty impact of individual TAGs or clusters of TAGs.** This argues for making impact evaluation a more important part of TAGs, with expectations laid out clearly at the design stage, adequate time, and funding earmarked for the purpose.

D. Recommendations

(a) Developing a Policy and Strategy for IFAD's Support to Agricultural Research

The programme has not had an agreed-upon strategy for guiding IFAD's contribution in the area of agricultural research. Preparation of a research strategy for the programme will first need to feed into, and then build upon, the output of the new task force that will recommend a general policy and strategy for IFAD's grant programme. Preparation of the research strategy should therefore build on the following axes: (i) IFAD's SF for 2002-2006; (ii) the new IFAD strategy for grants in general, and synergies between research grants and other grant lines; (iii) programme experience and lessons as captured by this evaluation; and (iv) regional technology gaps and research needs, as articulated by regional strategies. The strategy would need to cover:

- programme goal and general objectives;
- link with the IFAD SF;
- research focus of the programme, types of research IFAD should and should not finance, including extent to which it should be strategic or downstream, and respective time horizon;
- specific thematic priorities or technology gaps that have greatest importance during 2002-2006 (to be reviewed periodically);
- expected emphasis on innovative research;
- expected linkages between AR grant programmes and IFAD's loan portfolio;
- broad spectrum of partnership in setting research priorities;
- range and types of organizations the programme should support;
- relative importance to be given to agricultural research for technology development, as compared to socio-economic and policy research;
- relationship between grant-funded and loan-funded research;
- complementarity and linkages of AR/TAGs with other IFAD grant lines (particularly the Extended Cooperation Programme and small grants);
- expected role of farmers, CBOs and local participatory processes in setting research priorities and in implementation of research programmes; and
- guiding principles for generation and dissemination of knowledge from TAGs.

(b) Strengthening the Linkages between Grant-Financed Research and the IFAD Investment Programme

- Establish a system for joint loan-grant planning that would also strengthen communication between IFAD CPMs, grant coordinators, grant managers and the loan project staff concerned;
- synchronize grant/loan implementation;
- define the role of IFAD projects at the field level in forging linkages with grant-financed research;
- prepare/finalize divisional agricultural research strategies for both loan- and grant-funded research, with clearly identified priorities;
- establish a corporate-access database for the programme that is not limited to closed and ongoing grants, but includes pipeline applications in order to ensure greater transparency and to inform the joint planning process; and
- share information on technology outputs of the programme more widely through TANs on the IFAD website, as well as through other information networks and dissemination mechanisms.

(c) Enhancing the Poverty and Institutional Impact of the Programme

- Increase TAG duration to up to five years, as indicated in policy documents, to allow initial time for situational assessment and post-research time for impact evaluation;
- systematically include farmers, CBOs and NGOs as effective partners in setting research priorities and implementing research programmes;

- direct greater attention to both assessment of national capacities and further building of capacity for participatory research;
- systematically evaluate the impact of all TAGs, with earmarked funding for the purpose and agreement on indicators, including measures of utilization of grant outputs by IFAD investment projects; and
- identify consistently low IARC performers and determine steps to be taken.

(d) Improving Internal Processes and Procedures

- Further systematize grant review and selection procedures to enhance transparency, ensure fair competition among applicants and assign appropriate weight to innovative research;
- conduct better reviews of final proposals, particularly of institutional arrangements and capacity, M&E arrangements and research budget;
- review the impact of the 2000 screening procedures and processes during their 'trial' period to determine any need for improvement; and
- provide more comprehensive guidelines to grant applicants and recipients, and for supervision, evaluation and impact assessment of AR/TAGs.

(e) Resources Required Should be Reassessed and Adequate Allocations Made

- The recommended refocusing of the programme should be associated with a reassessment of the financial resources needed within the existing overall resource constraints.
- Human resource needs should also be reassessed, with a view to enhancing the programme's management and coordination, strengthening linkages with IFAD projects, and continuing technical backstopping and quality control. Such assessment requires a detailed analysis of the workload and time budget for IFAD staff concerned and is outside the scope of the present evaluation.
- Adequate resources should be allocated for supervision, and new, more effective modalities examined.
- The decentralization process introduced since May 2000, though highly desirable, needs to be reassessed in terms of its effect on linkages with IFAD loan projects. At the time of the evaluation, none of the new TAGs (post 2000) had been completed and hence could not be included in the assessment.

(f) Knowledge Generation and Dissemination Requires Immediate Attention

- TANs are a positive step in the right direction, but delays in their production need to be addressed. The notes could be fine-tuned to make them more useful to institutions and projects that might wish to consider the technology.
- A system needs to be set up to capture and share the many non-technical but useful lessons being generated on topics such as: institutional partnerships, participatory processes in research, methodologies such as impact monitoring and evaluation, and on transferability, sustainability and technology adoption processes.

Evaluation of IFAD's Technical Assistance Grants Programme for Agricultural Research

Corporate-level Evaluation Report

MAIN REPORT

I. AGRICULTURAL RESEARCH FOR RURAL POVERTY ALLEVIATION

A. An Overview of the Key Challenges

1. Persistent and Widespread Rural Poverty

1. It is now widely recognized that poverty has many dimensions and the most often measured parameters have included income (measured as less than USD 1 per day per person), food consumption (below caloric requirements), nutritional (stunting in children under five years) and asset poverty (physical capital as well human, social and financial). It has been estimated that more than 1.2 billion people in the world are living in abject poverty on less than USD 1 a day (World Bank, 2001). Using FAO estimates (FAO, 2000) of "agricultural poor" and applying UNDP Human Poverty Index (HPI)[19] to population numbers, it has been projected that the total agricultural poor population of about 786 million in 2000 would increase to about 823 million by year 2010 and to about 845 million by year 2020 (ICRAF, 2000). Given the persistent high proportion of current and projected agricultural poor, there are good reasons to emphasize poverty alleviation strategies that generate employment, provide access to reasonably priced food to the poor and contribute to economic growth. Agricultural research and technology can play a critical role in such a strategy.

2. The Role of Agricultural Technology in Poverty Reduction and Increased Food Security

2. Since small farmers and the rural poor are both producers and consumers, research to raise productivity and production through technologies that poor farmers can afford to adopt profitably can confer "producer-consumer" benefits to the rural poor. Despite initial controversies, the poverty reducing influence of agricultural growth led by the green revolution technologies (varieties, fertilizer and irrigation management) for rice and wheat in India is now well documented as a success story[20]. It is estimated that between 1960 to 1990, cereal production in India grew by nearly 3% per annum. Similar broad relationship across much of Asia is reported during the Green Revolution era where by 1995 the total number of poor declined from about 1.2 billion to about 0.8 billion despite a 1 billion increase in the total population. An evaluation of the impact of the genetic improvement work of the International Agricultural Research Institutes (IARCs) of the CGIAR and their NARS partners, concluded in 2000 that the adoption of improved varieties developed and released as a result of research efforts of these institutions has now become a dominant factor in most major crops. Further, analysis of the production impacts of these improved varieties showed that without the input of this research:

- price for grain crops would have been between 21 to 47% higher over the 25 year period depending on the crop;
- imports of food in developing countries would have been 9% higher;
- the area to crops, especially to meet increasing demand for rice, wheat and maize, would have been significantly higher;
- there would have been a higher number of malnourished children;
- the poor would have been hurt more by the higher prices as they spend higher proportion of their income on food.

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[19] The Human Poverty Index (HPI) developed by UNDP is based on measures of health, education and access to resources for maintaining livelihoods. HPI is well correlated with life expectancy.

[20] Data in this paragraph are based on: (Ghose, 1989); (Fan, Hazell and Thorat, 1999); (Datt and Ravallion 1997); (Rosegrant and Hazell, 2000); and (Evenson, 2000).

3. Matching Research Priorities with Regional Needs

3. Technological challenges vary from region to region in their severity and priorities. In Africa the focus of a pro-poor research and development strategy would be to increase yield of traditional crops (often termed as "neglected" or orphan crops such as cassava, yam, banana and plantain) and to improve nutritional quality in the diet of the poor, especially through legumes and vegetables. In the drier areas of the sub-Saharan Africa sustainable management of crop-livestock production system is as important as is increased productivity of crops. The rapidly growing more favored areas of Asia and Pacific region would benefit from diversification of production systems, value addition to commodities and development of non-farm economy. In contrast, in the more risky less favored areas priority would still be to develop technologies that increase productivity of staple foods crops. In West Asia and North Africa region the severity of natural resource constraints faced by the poor calls for a focus of technologies that conserve water, which is the most critical factor for sustainability, and growth of agriculture. Technologies for better management of degrading rangelands and highlands through integrated crop/livestock production systems along with appropriate institutions and policies, would be needed to secure livelihoods of the poor. In Latin America, with better functioning markets, the strategy could be to promote integrated high value agriculture for urban and export markets to improve income of the rural poor and accelerate growth of the rural economy. In hilly neglected areas, with low agricultural potential, other advantages can be exploited to help the poor, including biodiversity, agro-forestry, and promotion of indigenous forests products. A common theme in all the regions would appear to be the need to develop policy, institution and technological recommendations that conserve soil and water and improve sustainability of production systems.

4. The Socio-Economic Constraints

4. A good understanding of socio-economic constraints of the target farming communities is essential to the development of pro-poor technologies. Failure to do so often results in failure of what otherwise appears to be technically robust recommendations. There is a wide range of socio-economic factors that could influence adoption of new technologies. For example household characteristics such as family size and gender dimension (as an indicator of labor availability), age distribution (as younger farmers tend to be better adopters), farm size (as an indicator of potential income), access to non-farm income (if the new technology requires purchased inputs) and gender relations (as an indication of intra household decision making) could all be important considerations along with cost of technology, access to public services and credit, timely availability of critical inputs, access to market and information/knowledge. To ensure that these considerations are taken in to account researchers are increasingly undertaking both biophysical and socio-economic site characterization before commencing research. In addition, empowerment of farming communities and adoption of farmer participatory technology development and dissemination approaches are being adopted to ensure relevance to needs of the farming communities.

5. Empowerment of women merits special attention because of their primary responsibility for providing the food, water and fuel needs of their families (IFAD, 2001). In addition, certain farming activities, such as animal management, and several aspects of crop agriculture, are largely undertaken by women. As men from poorer rural areas migrate to other faster growing regions or to cities for work, women left behind have to carry a much greater burden for managing the family farm. Despite this, women have significantly less access than men to knowledge, assets and services. Singh and Paris (2000) analyzing the implication of increasing involvement of women in managing the rainfed rice-based cropping systems in Eastern India concluded that special efforts must be made to develop women's skills and knowledge in order to maximize benefits from new technologies. They also pointed to a need for further research to make new technologies more women-friendly and to asses additional constraints imposed by the migration of male members of the family on adoption of technologies largely suited to needs of the male managed farm households.

B. The Changing Focus of Agricultural Research

1. The Institutional Setting

6. The agricultural research and development (R&D) organizations that work for the poor in developing countries include the international centres for agricultural research (ICARs) supported by the Consultative Group on International Agricultural Research (CGIAR), some other international research centres supported by donors (non-CGIAR) and a number of regional research organizations. Most of these institutions have received support under the IFAD's Agricultural Research and Training (AR&T) programmes and have implemented the R&D programmes in partnership with the national agricultural research systems (NARS).

7. The CGIAR and non-CGIAR systems represent an early endeavor of the international community to develop a global agricultural research system. It started in1971 with the establishment of CGIAR. This initiative was jointly sponsored by the Food and Agriculture Organization of the United Nations (FAO), United Nations Development Programme (UNDP), International Fund for Agricultural Development (IFAD), and the World Bank. Starting with four international centres (CIAT, CIMMYT, IITA, IRRI), it has grown in to an association of 58 public and private members that supports a system of 16 international agricultural research centres (list is given in Appendix 1). The mission of the system is to reduce poverty and hunger in the developing world through research on technical and policy issues relating to the major food commodities of importance to the world's poor producers and consumers. In addition, it also works on natural resources and biological diversity to protect the global environment. Over the years the CGIAR has become of immense importance to NARS of the developing countries not only as a contributor to their research efforts but also in building national research capacity and as a bridge between NARS and the advanced research institutions (ARIs) of industrial nations. Other International Research and Regional Centres also exist and many undertake high quality R&D work in specialized areas of great importance to the developing countries. Both systems receive finance from national and international donors.

8. The National Agriculture Research Systems (NARS), usually comprise a lead national coordinating entity and agricultural research institutes. The system saw a rapid growth between 1970 to 85. In the case of larger countries such as China, India, Brazil and Nigeria, this resulted in a large expansion resulting in many cases by a proliferation of research institutions and programmes. IFAD's support to NARS provided through the AR&T programme has largely been channeled through the international and/or regional centres. The TAG financed research tries to ensure that the work is carried out in countries concerned through the national system. Such grants have often included support for national capacity building or networking between research systems of the participating countries and with the international centres. IFAD's direct support to the national systems is usually through loan projects. These can either be free standing research projects or a component in an agricultural development project.

2. The Emerging Challenges[21]

9. Even though the world's overall population growth rate is slowing, it is still projected to increase by about 73 million a year taking the World population to 7.5 billion by 2020. Most of the population growth and 85% of the increased demand for meat and cereals would be in the developing world. Thus, the challenge of reducing poverty and hunger in many parts of the world is as great today as it was 25 years ago. In fact, in Sub-Saharan Africa (SSA), given the prediction of low rates of future economic growth, the food situation is expected to be worse than it was in the past. FAO estimates that 22% of the undernourished lived in SSA in 1995/97 which would increase to 32% in 2015. The situation in parts of Africa is further aggravated by HIV/AIDS that is reducing agricultural production and has left some areas dependent on children and the elderly to tend to field activities.

[21] Based on (Rosegrant et al 2001); (FAO 2000); (Sackler 1999); (Garcia and Granger 1996).

10. In Asia there is little uncultivated land left which is suitable for agriculture. The rate of increase in irrigation, a second major factor in stimulating agriculture production over the last three decades, has slowed down dramatically since the 1980s. Fertilizer usage, another important contributor to increased food production in the past is either leveling off or in some locations is causing negative environmental effects due to excessive use. In all developing regions increasing population pressure, especially in rainfed areas, overgrazing, deforestation, inappropriate management practices and urbanization are leading to land degradation and loss of cultivable area. While there are variations between different parts of the world, the shortage of fresh water is looming as the most serious threat to food security and poverty reduction. At the same time irrigation induced environmental problems (e.g. salinization/sodification) are increasing, especially in Asia. Since agriculture remains the dominant water user in all developing countries, adoption of more efficient and environmentally safe approaches to water use are urgently needed. Socio-economic and demographic changes are also contributing to the loss of biodiversity. More than 70% of world's fisheries resources are overexploited leading to leveling off of marine fish harvests (Garcia and Granger, 1996). Global climate change poses special problems to sustainable increases in food production. Put together, these changes pose daunting challenges to increasing food production, reducing hunger and poverty.

11. In addition to the challenges outlined above, the public international (and national) research system on which the developing world depends for agricultural technologies also confronts a funding crisis. After seeing dramatic funding increases in global agricultural research during the green revolution period from USD 11.8 billion in 1976 to 21.6 billion in 1995, during the nineties this rate of increase has significantly slowed down or in some cases declined. In the case of the CGIAR system while the overall contributions have stayed around USD 330 per annum mark since 1995, in real terms, the funding has declined over time due to cost escalations related to inflation and other factors. This has triggered a number of actions to increase efficiency and a search for further innovations related to governance, institutional structure, programme composition and funding mechanisms, which are being reviewed on an on-going basis at various levels in the system.

12. The intensity of agricultural research investment as a proportion of agricultural Gross Domestic Product in the national agricultural research systems (NARS) in the developing world over the last 25 years has stagnated around 0.6% as compared to 5% for the developed world (Byerlee, 1998). This gap in investment between the developing and the developed countries are especially worrying in the context of increasing globalization of world agriculture in which technological advances would be crucial to competitiveness. NARS, therefore, not only require greater funding but also need to improve efficiency by rationalizing institutional structures, improve research management, sharpen poverty focus of research programmes and forge new partnerships with the public and the private institutions.[22]

3. The Evolving Research Agenda

13. **The changing focus of IARCs**. In response to emerging challenges, the international research agenda, especially that pursued by the CGIAR, has been evolving over time. In this process the Centres have taken advantage of advances in biological sciences (biotechnology), built on past knowledge for continued incorporation of desirable traits in to germplasm of mandated crops and integrated these with improved management practices, adopting a systems approach for sustainable increases in productivity. The social scientists have worked more closely with biologists and participatory approaches have been adopted to better understand the socio-economic circumstances of farming communities to deliver a more responsive research and development agenda. The gender dimension in agricultural research is receiving increasing attention. In addition, Centres, especially ISNAR and IFPRI, have highlighted the importance of appropriate policy framework for agricultural technology development, adoption and growth. Following the third review of the CGIAR system in 1997/1998, the system's new mission statement emphasizing food security and poverty eradication was redefined as follows: "to contribute to food security and poverty eradication in developing

[22] Data based on (Byerlee 1998); (Pardy and Beintema 2001); (CGIAR Secretariat); (Echeverria 1998).

countries through research, partnership, capacity building, and policy support, promoting sustainable agricultural development based on the environmentally sound management of natural resources".

14. **The promise of biotechnology for increasing the yield potential**. The quest for increasing yield potential of crops and animals would continue to be a high priority in the foreseeable future for meeting increasing food demand and to protect the environment. The gains made through the green revolution technologies would have to be matched by similar yield-enhancing technologies if challenges highlighted above are to be met. The attempts being made by IRRI scientists to re-engineer the rice plant to gain 20 to 25% advances in yield potential are an example of developments to come (IRRI Annual report 2000/2001). While inputs from all disciplines would be needed to increase yield potentials, part of these improvements would continue to be through germplasm improvement in which advances in biotechnology combined with the conventional breeding programmes would play a crucial role.

15. To realize full potential of improved germplasm researchers are increasingly adopting a holistic approach that integrates new varieties with practices that take into account not only scientific information for sustainable management, e.g. of pests and natural resources, but also indigenous knowledge of farmers and their socio-economic circumstances. Examples of this approach can be found especially in the fields of Integrated Pest Management (IPM), Soil, Water and Nutrient Management, Natural Vegetation Management and Biodiversity Conservation.

16. Since the mid-seventies an important biotechnology tool, marker assisted selection, has been used in conventional plant and animal breeding programmes to transfer desirable genes in to preferred lines. Ever since first transgenic plants were tested in 1982, the potential role of biotechnology has seen an ever advancing horizon[23]. Despite its immense promise, however, application of biotechnology to crop and livestock improvement has raised a number of questions. Since most of the commercialized biotechnology products are based on proprietary science with high end-user costs, accessibility by the poor remains a crucial issue. In addition, there are concerns about the environmental and food safety of engineered species that are governed by national, regional and global regulatory systems. Further improvements in regulatory mechanisms and risk assessment criteria is an active area of on-going debate.

4. Role of the Public and the Private Sector in Agricultural Research: The Evolving Debate

17. **The public sector**. Although the priorities for the agricultural research system continue to be development and poverty alleviation, as indicated above, over the last 25 years the nature of problems that need to be addressed have become more complex and, in some cases, have global implications. The issue is no longer to produce more food but to do it a way that is not harmful to the environment. This in many cases requires long-term multidisciplinary research and new partnerships that go beyond the limits of traditional agricultural sciences. Given the public goods nature of the product a significant share of the responsibility for financing this research lies in the public domain. Despite this need, however, in developing countries public sector institutions are experiencing increasing shortages in funding, human resource capacity and a deteriorating infrastructure. In the developed world with a significant shift in research funding from the public to the private sector, science based products are increasingly covered by the intellectual property right (IPR) regimes. These trends raise

[23] For example, it has made it possible to solve problems caused by biotic and abiotic stresses, especially in less favored areas. The cotton plant with insertion of gene that confer resistance to a key insect, herbicide tolerant soybean and maize are now widely cultivated in many countries of the world. Researchers have produced transgenic plants that tolerate drought (wheat, rice), salinity (rice), flooding (rice), aluminum toxicity (maize). Delayed ripening traits that improve shelf -life in tomato and melon have been commercialized and the technique offers potential for reducing high post-harvest food looses of perishable products. Insertion of genes that modify nutritional status of plants (e.g. enhanced beta carotene production, a precursor of Vitamin A, in rice, mustard) or make it possible to use plants as medium for synthesis of products with medicinal properties is being actively researched. In animal agriculture attempts are being made to address environmental problems caused by nutrient runoff from intensive pig farms by producing transgenic pigs.

serious concerns both from the point of view of strengthening capacity of NARS in the developing countries, especially in SSA, and in accessing IPR protected technologies.

18. **The private sector.** Globalization of agriculture and increasing institutionalization of IPR regimes under various WTO agreements as well as growing demand for inputs in agriculture due to commercialization are potentially making private for-profit investment in agriculture more attractive, e.g. in agricultural chemicals, biotechnology and seed industry. As a result private research is expected to grow but at a significantly variable pace in different countries depending upon the circumstances. Pray and Umali-Deininger (1998) Examination of evidence on whether the private sector can fill the gap of declining public research in developing countries, concluded that countries with large markets for modern inputs, strong IPR rights, a strong science infrastructure and supportive government policies can expect to see a broad based growth in private investment (e.g. Brazil, South Africa, Malaysia) that would fill the gap or replace public investment in some areas of applied and adaptive research. In countries or sectors where these conditions are only partially met (China, India) the private sector will remain small. Countries where most of these conditions are not met or are missing, are most likely be ignored by the private sector, most countries of SSA.[24] However, many would question the ethical basis of the increasing coverage of agricultural science based products by IPR and the consequent growth in private agricultural research in a world where poverty and hunger inflict a large majority.

19. **Link with community level institutions**. Empowerment of communities to encourage participation in both social and economic development activities is now a common theme of interventions aimed at poverty reduction. Many IFIs strategies of assistance emphasize decentralization and empowerment at the local level as an important plank for achieving pro-poor rural growth. In the community based development programmes the empowerment process has invariably used participatory approaches and involved Non-governmental Organizations (NGOs) to mobilize communities. The use of participatory approaches in technology development and dissemination started ten years ago and is gradually spreading. In some instances local grass roots institutions have been strengthened. Ashby et al (2001) through local initiatives, training, financial and technical support, have successfully taken over important research decisions. The experience of these initiatives, while still relatively young, have shown that by devolving adaptive research to the farming community, the cost of formal research is reduced while increasing its impact. This approach merits further promotion, especially in directing research towards neglected areas.

II. THE EVALUATION

20. In recognition of the importance of agricultural research for rural poverty alleviation, the IFAD Technical Assistance Grant Programme for Agricultural Research has been initiated in 1979 with the Fund's inception. Between 1979 and end 2001 a total of 199 Grants for Agricultural Research and related training have been approved for a total of USD 172 million. There has been no comprehensive evaluation of the AR&T programme in the more than two decades of operation. A desk review of the programme was conducted in 1996, and a number of regional reviews have also taken place, most notably in NENA region. The present evaluation is therefore long overdue. As in the case of other IFAD programme evaluations, it mediates the Programme past and future. The ultimate objective is to increase the effectiveness of IFAD's support to agricultural research, and thereby, to enhance IFAD's impact on poverty.

A. The Objectives and Expected Outcomes of the Evaluation

21. The evaluation has four main objectives:

i) Assess the achievements of the AR&T TAG Programme (in relation to its objectives) and the extent to which the Programme has fulfilled such objectives.

[24] Data based on (James, 1996); (Prey and Anderson, 1997).

ii) Analyze the main trends in grant funding for research over the years, identify reasons for changes, and assess the relevance of the Programme in terms of current IFAD's strategy and priorities.
iii) Identify and analyze factors that have affected the Programme's effective and efficient operations and likely impact.
iv) Provide clear and realistic recommendations for future orientation of the Programme, which will represent building blocks in articulating a strategy of grant resource utilization.

22. The evaluation is intended to generate three main outcomes:

i) Recommendations for updating or, if indicated, reorienting IFAD agricultural research agenda and policy. Such recommendations need to approach the AR&T Programme in the context of the importance of agriculture research for poverty alleviation and the value IFAD places on partnerships (with CGIARs, non-CGIARs and with the National Agriculture Research and Extension System, NARES).
ii) Recommendations related to Programme relevance and impact. The evaluation views relevance as having three dimensions: poverty, the Programme priorities, and regional research priorities, as defined by IFAD regional divisions. Impact is viewed from three perspectives: poverty, institutional impact, and impact on knowledge.
iii) Recommendations related to the Programme's reach and efficiency. This includes the distribution of grant resources between institutions, regions, countries and types of research, as well as management efficiency, and efficiency of knowledge sharing between IFAD and its partners.

B. The Evaluation Methodology

23. The evaluation was designed to be participatory, involving both the grant recipient organizations (CGIARs and non-CGIARs) and IFAD staff. The evaluation process was both desk and field based. It is based on a four pronged approach:

i) A desk review of all available documents for 42 grant programmes involving 67 individual TAGs, out of 199 approved TAGs between 1979 and 2001.
ii) Discussion with IFAD staff, particularly those involved in TAG processing and management.
iii) A formal survey of all grant recipient institutions.
iv) Field visits to a selected nine grant recipient institutions in all regions.

24. The findings of these three sources of information are synthesized and analyzed in the evaluation report.

1. Desk Review of Documents

25. **Review sample selection**. A sample of 42 grant programmes (corresponding to 67 approved TAGs, i.e. 34% of the total), with a value of approximately USD 49 million (i.e. 28% of the total funds allocated to the programme), was selected for comprehensive desk review. Of these 67 TAGs, 54 are closed representing 34% of the total number of closed grants as of end 2001. To the extent possible, this sample was selected on the basis of the following criteria:

- Regional representation close to actual allocation under the programme from 1979-2001.
- Institutional representation (CGIAR and non-CGIAR recipients of grants) close to relative allocation under the programme.
- Thematic diversity of research topics, roughly in line with actual allocation under the programme.

26. In addition to the above main selection criteria, it was ensured that the sample represented at least one to three of the both global grants (classified as such by PT) and the largest grants and longest institutional relationships.

27. A smaller sample of (eight) ongoing (post 1998) TAGs were included in order to capture new trends, particularly as these grants would be operating under the new PMD Guidelines[25].

28. Two factors may have introduced some bias into the selection process, but wherever possible, this was accounted for in the data analysis:

- Lack of documentation: the team found that many of the selected completed TAGs did not have sufficient documents in the files with the result that these had to be replaced with the closest matching TAGs that did have the minimal necessary documentation (defined as having a design report, obviously a President's Report, and a completion report). Since it can be assumed that the better performing institutions are also better at reporting, the adopted process may have introduced a positive bias into the selection process (assuming that the documents had not simply been misplaced in IFAD). Inconsistencies in the database, particularly the differences in approach to numbering of grant phases, also may have resulted in some distortions or bias.
- Reviewer or staff interest: staff interest in having particular grants reviewed was respected where possible and reviewers may also have biased selection through personal interest or reputation of certain TAGs.

29. **The Framework for review**. A detailed framework was used for analysis of all grants (Appendix 5). The three main sections of the framework were: design, performance and impact. The design assessed IFAD's rationale for funding the TAG, clarity of objectives, components, implementation arrangements and internal consistencies among all these aspects. Attention was also paid to special features such as nature and extent of integration of socio-economic research, M&E arrangements for the TAG, extent of intended NARS' involvement and clarity of fund's allocation. Performance of the TAGs was evaluated in terms of (i) relevance of objectives with respect to IFAD's mandate, the TAG programme, the needs of the poor and regional priorities and strategies; (ii) effectiveness in achievement of objectives; (iii) linkages with IFAD loan portfolio; (iv) participatory performance; (v) partnership performance of both IFAD and the implementation partners; and (vi) efficiency of the grants programme on the basis of available information on economic (cost/benefit assessment) and financial and managerial efficiency.

30. The impact of TAGs was assessed on rural poverty, on policy and institutional development at various levels and on knowledge, though obviously this was difficult to do. The review also attempted to assess likely sustainability of benefits, defined as the perceived ability of the research and extension systems of the collaborating countries to support the area of research during the post-project period.

2. Grant Recipient Survey

31. As part of the evaluation, a survey was conducted of institutions that had received grants under the programme (Appendix 6). A total of 31 Questionnaires were sent out. The questionnaire explored institutional partnerships and capacity building, establishment of research priorities, research approaches used, and research outcomes and impact. Respondents were also invited to make suggestions to IFAD for improving the effectiveness and efficiency of the TAG programme.

32. There was a good response, with 25 institutions responding, i.e. 80% of recipients (See Appendix 7). The responding institutions were:

[25] PMD, *Guidelines for AR&T Grants*, Rome: Approved by the OSC in December 1997.

- CGIAR respondents: CIAT, CIFOR, CIP, ICARDA, ICLARM, ICRAF, ICRISAT, IFPRI, IITA, ILRI, IPGRI, IRRI, IWMI (IIMI), WARDA. (Total =14).
- Non-CGIAR respondents: ACSAD, AOAD, CARDI, CATIE, FAO, ICIPE, IDRC, IFDC, IICA, INBAR, SSO. (Total =11)

33. The responding institutions were fairly well balanced between CGIAR and non-CGIAR, in line with their comparative importance in the Programme. The only non-respondents were CIMMYT, for the CGIARs, and CEDARE, CIHEAM, INFOSAMAK, OAU/STRC and RADHORT for the non-CGIARs. The evaluation was aware that a certain amount of response bias could exist, since respondents were identifiable, but responses were cross checked with other sources of the same information, and inconsistencies are acknowledged in the report. Overall, the most useful contribution of the survey responses was not in providing quantitative data, but in the detail of explanations provided and the views expressed. Most of this data has been integrated with other findings, except for a separate section on suggestions and recommendations made to IFAD.

3. Institutional Visits

34. The evaluators visited a total of nine grant recipient institutions in Asia, Latin America, Africa and the Middle East. Six CGIAR and three non-CGIAR institutions were visited. The main purpose was to verify information and analysis of the desk review and institutional questionnaires through consultations with staff of IARCs, NARES, visit to research sites and to the extent possible discussion with NGOs/CBOs involved in the research programme.

35. Institutional visits involved intensive consultations with staff, particularly those who were or had been involved in IFAD funded TAG implementation, and, as relevant, consultations with NARS, NGO, extension or other partners, field visits to ongoing IFAD TAG project and focused discussions with farmers participating in field testing. The visits served to check on other data sources, and to round out and cross-check such information. Reports were drafted on each visit. Findings have been integrated, as appropriate.

III. OVERVIEW OF THE AR&T TAG PROGRAMME

A. Historical Background: the Evolution of IFAD's Approach in Supporting Agricultural Research

1. The Lending Policies and Criteria: Setting the Agenda

36. The Lending Policies and Criteria (LP&C) illustrates the Fund's original view of the role of research. The food problem of the poor, it states, may be approached from different angles. One of these is that of "encouraging research and extension to the production of foods consumed by the poor". Another is that of "researching, developing and extending technologies which increase employment while raising the productivity of land and capital"[26].

37. The LP&C goes on to specify that the Fund's Technical Assistance including that for research "would normally be provided on a grant basis". However, one of IFAD's main objectives in setting up its Grant Programme, at its inception, is that of linking it to its investment portfolio. In this respect, the LP&C states that: "support to countries for research and extension activities, in particular, the development of technology appropriate to small farmers would be supported. Small scale but innovative projects with a strong exploratory element, leading to future larger scale investment decisions, would receive special attention" (paragraph 29). Paragraph 35 of the same document allowed the Fund to provide grants for suitable activities of international regional and national research institutions.

[26] IFAD Lending Policies and Criteria, paras. 16, 17 & 18

38. **Goal and objectives of the programme.** IFAD's approach in supporting agricultural research evolved gradually on the basis of this broadly defined agenda and the Fund's subsequent practical experiences. The approach is embodied in a number of Board Documents between 1978 and 1991 and an internal 1997 document.[27] In all these documents the objectives and priorities of the programme were formulated in very broad terms without clear prioritization. This has led to a wide ranging interpretation of the role of the programme in-house and with its partners. The overall goal of the programme was broadly seen as contributing to the reduction of rural poverty (specifically among IFAD project beneficiaries). The objectives of the programme, while never stated clearly and categorically, can be construed as:

- Develop and adapt appropriate and sustainable technologies within a reasonable span of time in support of resource poor farmers and the rural poor.
- Promote IFAD's partnership with IARCs to influence their agenda towards pro-poor research.
- Strengthen the capacity of these institutions, as well as National Agricultural Research Institutions for pro-poor research and training.
- Support technology related socio-economic research to ensure relevance and sustainability.
- Generate knowledge and information on appropriate agricultural technologies and practices.

39. Four periods can be distinguished in the development of IFAD's approach to agricultural research: an early period going from 1979 to 1984, a second one from 1985 to 1991, a third one from 1992 to 1996 and a last period starting from 1997. The four periods should be considered as a continuum, and not as discrete phases in time. Indeed, some overlap of emphasis and concepts can easily discerned throughout the four periods. However, broadly speaking, some dominant features of research are still recognizable, and can be broadly attributed to each period.

2. The Early Years: 1979-1984

40. During the very early years, **the Programme's research emphasis was placed on commodities rather than on factors of production or on farming systems.**[28] At the time, International Research Centres (IARCs) belonging to the CGIAR system were working on improved varieties of cereals, legumes, and roots and tubers, many of which were the food and feed crops produced and consumed by the rural poor. IFAD supported these centres with the aim of adapting the technology created to the needs of resource-poor smallholders, and at the production of applied technology for smallholder agriculture. An additional beneficial impact was that of influencing the research agenda of CGIAR centres towards resource-poor smallholder production systems.

41. The strong emphasis on commodities lasted only for the very first years, after which IFAD progressively moved towards farming systems research having realized its necessity for the rural poor. As the need arose to formalize IFAD's Grant approach, a set of priorities and criteria for the choice of AR&T TAGs were approved and endorsed by a 1982 Board[29], and further modified by the Board in 1984. The research programmes that were to receive support by the Fund would have to reflect one or more of the following elements[30]: a) Concentration on basic food crops, including low-cost food crops and pastoral livestock production; b) Integration of crops and livestock into a viable farming system that would meet the specific requirements of the small farmer; c) Focus on new crop varieties and farming systems that would substantially raise the potential of areas with poor water control, lower fertility and periodic drought stress; d) Improvement in the quality of the product, in the reduction of losses due to pests or diseases, and in the conservation of soil fertility or saving of inputs; e) Improvement in institutions and economic policies which, under certain circumstances, can contribute as much to increasing agricultural output as can the more conventional biological and

[27] Guidelines for AR&T TAG, 9 December 1997.
[28] EB 84/21/R.26, IFAD's role in financing agricultural research", p.10
[29] EB 82/16/R.46, "IFAD's role in financing agricultural research", p.2-3
[30] EB 84/21/R.26, IFAD's role in financing agricultural research", p.3

physical research; f) Development of technological innovations to reduce the workload of women in agriculture and increase their income and employment in the agricultural sector.

42. One of the research directions that emerges from these elements is one that would lead towards a "more efficient and stable mixed-farming system"[31]. This greater emphasis on farming systems led to another shift in the direction of the research: because small farmers' situations are local, and differ from one another in many respects, research should therefore be location-specific. Institutionally speaking, this meant widening the scope of IFAD's finance to cover, in addition to CGIAR-IARCs, region-specific non-CGIAR centres. Indeed, towards the mid 80s, the share of Grant funds going to the CGIAR centres decreased while the share directed at non-CGIAR region-specific centres, closer to national institutions, increased.

3. 1985-1991: Shifts in Focus with IFAD's Enhanced Specificity

43. In the second half of the eighties, IFAD set itself new research objectives linked primarily to the sustainability of farming systems. The Fund documented its realization that research for increased sustainability included the development and adaptation of new technology that would make optimal use of land and water resources. Alongside the development of agricultural production technology, the emphasis was gradually shifted from long-term basic research to the downstream aspects of the applied research, the adaptation and adoption of technology to fit particular farming systems and the technology related socio-economic research. The grant approach that thus evolved during this period was one that "further moved Fund-supported agricultural research and training closer to the users and beneficiaries of its operations"[32]. This shift was also due to IFAD's enhanced "specificity", consisting of the paramount importance of rooting research and extension in the demand of the poor, including women. The need thus emerged to develop participatory approaches at the grassroots level for setting the agendas of research, testing and adaptation of agricultural technology. At the institutional level, moving closer to the poor required a closer relation with and feedback from the latter. Considering that national research institutions (NARS) would be better placed for this purpose, the Programme thus started an approach of progressively involving NARS more into its research efforts.

44. Consistently with the above shift in focus, the type of research supported also gradually changed. In the early years the Fund seemed to privilege long-term basic research[33]. Towards the end of the eighties its role was considered to be most useful in "supporting the downstream aspects of the applied research to develop high-yielding crop varieties which can be used by small farmers through on farm testing/adaptation to local parameters of soil fertility, water availability, pests and weeds..."[34]. In terms of partnerships, this meant the need to create linkages not only with the relevant international and regional research institutions, but also with private and public sector institutions, which would be willing to invest in biotechnological research oriented towards resource-poor conditions.

4. 1992-1996: The Evolving Policy Framework and the Link with Socio-Economic Research

45. An important paper, presented to the Board in 1991, makes a series of important suggestions in terms of future research approaches, based on earlier developments, and that were later to be incorporated in the 1995 additions to the LP&C and, more importantly and fully, in the 1997 "Guidelines for Agricultural Research and Training Technical Assistance Grants (AR&T TAGs)".

46. Apart from the development of technology, and as part of the effort to strengthen the adaptation and adoption of technology, other areas of research were suggested for further consideration. One of the main areas highlighted was that of agricultural technology related socio-economic research: "the

[31] EB 84/21/R.26, IFAD's role in financing agricultural research", p.10
[32] EB 91/44/R.78, "IFAD's Evolving Policy for Grant Financing of Agricultural Research", p. 6
[33] EB 82/16/R.46, "IFAD's Role in Financing Agricultural Research", p.4
[34] EB 91/44/R.78, "IFAD's Evolving Policy for Grant Financing of Agricultural Research", p. 25

Fund should continue its increased support for socio-economic research as a central and intrinsic parameter of research programmes which seek to develop technology for small farmers"[35]. Socio-economic research was considered important for a number of reasons. First of all, to move closer to the beneficiaries, socio-economic research would also be crucial in addressing the relationship between the farmer and the research-extension system with an emphasis on feedback mechanisms which can ensure that the needs of the beneficiaries be fully reflected in the technology generating process. In this effort to create a client demand-driven technology system for farmers, the role of NGOs as facilitators of this feedback linkage would be studied.

47. The paper also strongly suggested that socio-economic research be put in practice to address other issues, such as those of: creating incentives to promote beneficiary participation in the process of transition from subsistence farming systems, towards sustainable production systems; studying important factors linked to poverty alleviation such as household food security, health and labour productivity; establishing the basis for steering research towards more diversified crops, in particular towards high value crops and livestock (including fisheries and forestry) as well as rural micro-enterprises. With respect to the latter, an adequate accent would have to be placed on post-harvest technology for handling, storage, processing, and marketing.

48. At an institutional level, the paper called for a precise commitment on behalf of IFAD to strengthen the capacity of NARS. Until then however, IFAD should "continue to provide support [to technology testing and adaptation to location-specific conditions] through collaborative research networking"[36].

49. This greater emphasis on beneficiary participation and client-oriented research was clearly reflected in an important additional annex to the LP&C. The specific elements of the new research approach defined in the 1995 Annex include "client-oriented research". The approach is to "make the smallholders the initiating partners ... in the process of identification of technology issues, and in the development and diffusion of new technology"[37]. The Annex goes on to explicit that, on the basis of this approach, **"IFAD's support for international, regional and national research centres will focus on five areas: a) traditional food crops; b) farming systems; c) environmentally-sustainable agricultural technology; d) technology to reduce the drudgery of women's work; and e) the decentralization and refocusing of agricultural research".**

5. The 1997 Guidelines

50. In 1997, for the first time a set of formal Guidelines for AR&T TAGs were prepared "in response to an urgent need for developing and agreeing upon a structured approach towards initiation, development, approval and supervision/administration" of the AR&T component of the TAGs. The Programme is seen as an instrument that "focuses on the development, through applied and adaptive research, of innovative and effective means to eradicate rural poverty"[38]. The Fund's entry point in the research process is clearly defined as well as the time frame for its activities: "the research programmes... will principally involve adaptive and applied research rather than basic research", so as to yield results within a relatively short time-frame.

51. It is important to note that, even more so than in the past, there is a clear intention starting from this date to link the Programme strongly to the Fund's loan portfolio and corporate strategy. A 2000 Board paper claims that "in the early years the research programme was more driven by the needs of the international and regional research centres rather than by IFAD's own corporate strategy[39]". The setting up of formal guidelines and internal screening and review processes in 1997 therefore

[35] EB 91/44/R.78, "IFAD's Evolving Policy for Grant Financing of Agricultural Research", p. 25
[36] EB 91/44/R.78, "IFAD's Evolving Policy for Grant Financing of Agricultural Research", p. 27
[37] Lending Policies and Criteria, Annex, para.18, p.27.
[38] "Guidelines for Agricultural Research and Training TAGs", PMD, December 1997, p.1
[39] EB 2000/69/R.11, "Grant Financing: A New Approach", p.5

represents an attempt by IFAD to "get a firmer hold of its strategic focus and priorities", and to create a tighter link between IFAD's loan and research programmes. Thus, at the beginning of the "Guidelines" there is a clear reference to the AR&T Grants Programme as being "a critical instrument for the pursuit of IFAD's corporate strategy". In addition, the first selection criteria contained in the document concerns the "Responsiveness" of the AR&T TAG proposals: "[these] should address issues and concerns of relevance to the current and future loan portfolio of IFAD's regional and corporate strategies"[40].

52. In terms of areas of focus the 1997 guidelines presented the following list of "critical technical areas", within which specific priority areas are to be determined at the level of the regional operating divisions: a) Focus on crops, livestock and aquatic production; b) The integration of crops, forestry, aquatic resources, livestock and micro-enterprise activities within a viable (farming) system which would meet the specific requirements of the rural family and their nutrition and household food security; c) Recognize, build on, and transfer traditional agricultural technology and practices, including the development of innovative farming practices that would: substantially raise the potential of rainfed areas with poor water resources, address problems of low soil fertility and periodic drought stress while emphasizing the need for sustainable natural resource management; d) Support socio-economic and organizational analysis to increase understanding of farm and market-level constraints to agricultural and rural development; e) Develop pre- and post-harvest technology; f) Develop time and labour-saving technological innovations with an explicit focus on reducing the workload of poor rural women; g) Support the development, training and introduction of improved... practices in the management of water resources; h) Develop/strengthen regional and national research and training institutions to create indigenous capacity for conducting research and training; i) Support networking and training initiatives [as well as the] dissemination of results and promotion of collaboration ... among researchers.

53. The areas of focus listed above capture and reflect the changes in emphasis that evolved throughout the past 20 years. There is thus a balance between food crops, livestock, fisheries as well as their integration within a viable farming system. The Fund also explicitly acknowledges that "technology to increase productivity and improve production will have little success in poverty alleviation in the absence of other support, such as pre and post harvest and processing technology for preservation and adding value at or near the farm". Other changes visible in the 1997 "Guidelines" include a recognition that efforts to develop new technology must build on the traditional practices of small farmers. In line with the previous areas of focus, the Guidelines also contain an explicit reference to the need to "develop time and labour-saving technological innovations with an explicit focus on reducing the workload of rural poor women". The development of national institutional capacity for research through training and support for networking are also explicitly emphasized.

54. It is important to note that the Guidelines also spell out in detail the criteria to be applied in considering research grants for entry into the pipeline, and for their design and development. According to these criteria, grant proposals should: address issues and concerns of relevance to the current and future loan portfolio; lead to significant, measurable impact on IFAD beneficiaries; have sustainable knowledge dissemination through downstream linkages with concerned networks and institutions; and contain adequate implementation and organizational arrangements, including procedures and indicators for monitoring, a budget indicating that adequate resources will be available for the implementation of key activities, provision of independent auditing and evidence of the institutional capability of implementing agencies. The Guidelines also set out the screening and review process and procedures, including a scorecard and ranking procedure. An important development introduced in the new procedures is that any division in the Project Management Department can identify, develop and supervise research TAGs. This is a major shift from earlier practice where these responsibilities were only borne by the Technical Division.

[40] "Guidelines for Agricultural Research and Training TAGs", PMD, December 1997, p.5

7. Financing Arrangements

55. Article 7 of the Fund's agreement stipulates the conditions of grant financing: "the proportion of grants shall not normally exceed one-eighth, or 12.5%, of the resources committed in any financial year". At its 23rd Session held in 1984 however, the Board approved a floor of "at least 3.5% of its total loan and grant commitments or USD 14 million, whichever was greater, to agricultural research". These decisions were amended by the Executive Board in 1988. The floor of USD 14 million annually was removed. Grant funds would represent 5% of IFAD's annual effective lending programme, and AR&T TAGs would be eligible for 70% of this sum (3.5% of total resources committed annually). In 1994[41] however, the overall cap for TAG financing was raised to 7.5%, while the overall cap for Agricultural Research remained at 3.5%[42].

56. In the early years of the CGIAR system, the Research Centres had three separate budget categories –unrestricted core budget, restricted core budget and special projects. Given that the "restricted core" programmes included many long-term commodity based basic research activities that was of interest to IFAD at the time, the Fund devoted the largest proportion of its financing of AR&T to such programmes[43]. As the Fund moved away from a long-term research focus however, the practice of reserving CGIAR grants almost only for restricted core activities was discontinued (EB 34 - 1988). Today IFAD funds only specific activities and does not contemplate funding any portion of the centres' core budgets.

B. Programme Resource Allocation: Patterns and Trends

1. Overview of AR&T TAG[44] Financing Trends

57. From IFAD's inception to December 2001 the Fund approved a total of 199 AR&T TAGs for a total of USD 171.541 million[45]. These were granted to 32 Agricultural Research Centres, of which 17 are CGIAR centres and 19 are non-CGIAR (See Appendix 2). The IFAD supported TAGs were implemented in 89 countries. Only 39 of these TAGs are currently ongoing. It is important to note that the Fund allocates annually a certain number of "small" grants, i.e. TAGs worth less than USD 100 000, which only require the President's signature rather than the Board approval. Some of these relate to technical backstopping to IFAD financed projects, others are used for consultations and workshops and others yet as support for larger AR&T TAGs[46]. Some CGIAR centres have also received small TAGs[47]. All small TAGs are outside the scope of the present study[48].

58. While in the very early years large amounts of funds were granted to the programme, this trend declined and reached a low in 1991-1992 (Graph 1). The reason for the decline was due to a decision made by IFAD management to minimize the AR&T Grant's Programme momentarily. Following the presentation of a new Policy Paper for the Programme in 1992, and the succession of a new President,

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[41] EB 94/53, p.2

[42] This last ceiling however, is not rigid, and a "three year moving average" principle is applicable: the ceiling can thus be exceeded in a single year, but the overall average over the immediately previous three years must not exceed the prescribed 3.5%.

[43] EB 84/21/R.26, IFAD's role in financing agricultural research", p.9

[44] *All references to "TAGs" in this chapter refer to Agricultural Research and Training TAGs.*

[45] *This figure does not take into consideration subsequent cancellations of grants or portions of grants. The number of grants taken for this study corresponds to the number of Board submissions and approvals.*

[46] *Such as the "small" TAG 507-FAO on the "Development of myco-acaricides for bont tick control in the Caribbean", in support of the larger TAG 320-FAO, "Programme for adaptive research on environmentally sustainable strategies for the control of the tropical bont tick from the Caribbean".*

[47] *Such as TAG 522-ICIPE "Enhanced Rice/Wheat Production in the Indo-Gangetic Plain" and 409-ISNAR "Development of a Method for the Impact of Agricultural Research".*

[48] *However, two of these "small" TAGs (544-GFAR "Research Poverty and Rural Poverty Alleviation", and 543-ENDA "Evaluating the Impact of Research Partnerships") have been included in the sample of TAGs analysed more in detail in Chapter 4.*

the programme steadily began receiving more funds, until almost reaching the level of USD 12 million in 2001, but never caught up with the high level of USD 15 million in 1982.

59. The initial peak may be explained by the fact that in the early years, AR&T grants were largely individual-commodity based, and were often given in large yearly commitments in support of the same programme. Examples of such early TAGs are ICARDA's TAG 1 that received nine consecutive yearly grants of about USD 900 000 each in support of its faba beans research programme in the Nile Valley or IITA TAG 2 with six consecutive yearly grants of USD 1.1 million in support of Root and Tuber in Africa. ICIPE received nine yearly grants for its research on crop borers (TAG-39) in Africa, of about USD 850 000 each. From 1980 to 1985 CIAT received six yearly grants for its research on field beans in Latin America (TAG-33). IRRI received the same number of yearly commitments for its rice based cropping systems research in Asia (TAG-35) both of about 1 million each. This was the major funding arrangement of the TAG programme until 1989. Following this year, TAG allocations were approved for periods of three years, and were smaller. Indeed if we take three years to be the standard period of duration of a programme, then the average grant size prior to 1989 was USD 1.9 million, against USD 1 million after 1989.

60. From 1979 to the end of the 1980s, AR&T TAGs have represented more than 50% of the total amount of grants allocated by the Fund, with peaks of over 70% in the earlier years. As Graph 2 shows, however, this proportion decreased dramatically from 1988 to 1991, and it is only in 1993 that the amount of funds allocated to AR&T increased again and reached the level of almost 40% in 2001.

61. In terms of types of research supported, the most notable feature of the AR&T TAG programme has been the shift from applied research, which occurred frequently in the first decade, to the more downstream adaptive research and technology validation (Table 1 and Graph 3)[49]. In quantitative terms, these two types of research have remained dominant throughout the years with respect to other types of research. IFAD allocated only a small portion of its funds in the early years to finance strategic research. During the last period, both socio-economic research and institutional development have grown in importance, and that after the late eighties there has been a more balanced distribution of funds between categories.

2. Regional and Country Distribution of Grant Funds

62. Geographically speaking, the highest amount of funds has been granted for activities in Africa (41%), followed by the Near East and North Africa Region (NENA) (29%), and Asia and the Pacific (17%). Latin America has been granted the lowest share of TAGs (10%). (Table 2 and Chart 1). In terms of the thematic focus of each region, most regions are in line with the emphasis given to crops/cropping systems. Table 3 shows that most of the TAGs allocated for Natural Resource Management and Integrated Pest Management have been directed to Africa (74% and 66% respectively), while most of the Post Harvest activities and TAGs concerning Socio-Economic Research have taken place in Asia (79% and 43% respectively). It is also interesting to note (and possibly not surprisingly so) that in the case of NENA, all of its natural resource management TAGs deal with water management. NENA has also been the region where most funds for technology related institutional development have been granted (54%).

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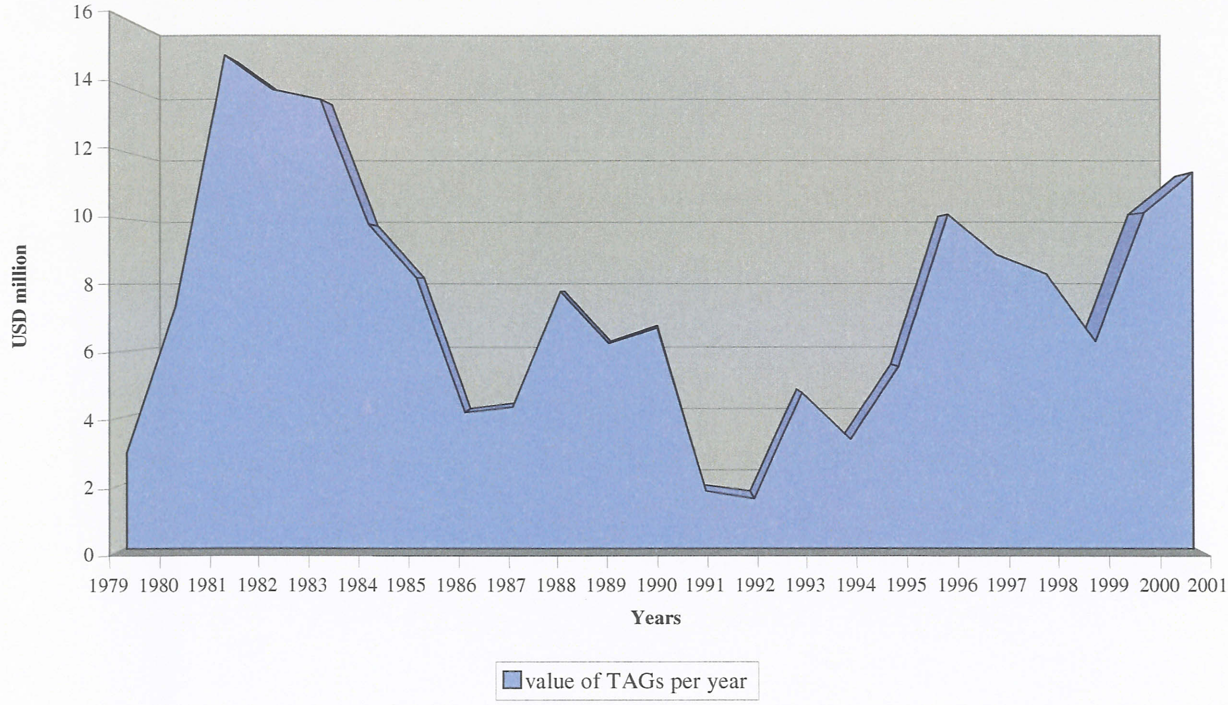
[49] *The definitions of each research typology used are as follows:*
strategic research – the quest for solution of specific research problems; *applied research* – application of scientific knowledge to the solution of practical problem; *adaptive research* – development of technological packages using solutions to practical problems from applied research; *technology validation* – on-farm trials to test applicability of technological packages to specific locations/situations.

Graph 1: Trend in amounts approved for AR&T TAGs per year



Graph 2: Proportion of AR&T TAGs vs total TAGs per year

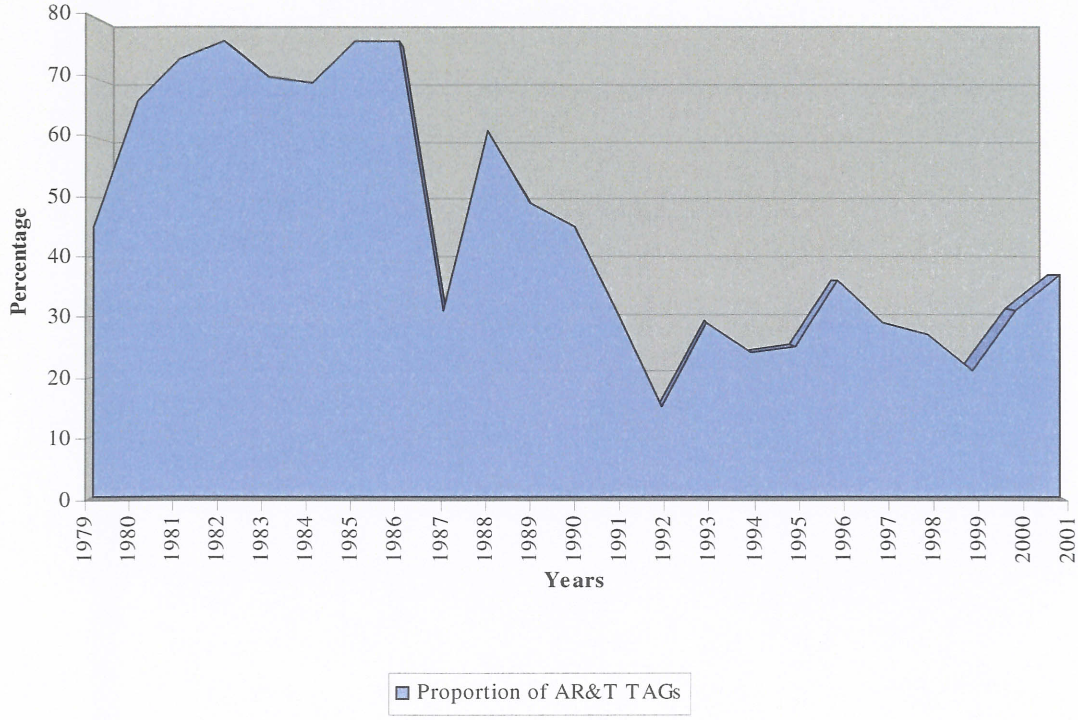


Table 1: Funds allocated (in USD million) per type of research per period

Types of research	*1979-1985*	*%*	*1986-1993*	*%*	*1994-2001*	*%*	*Total*	*%*
Strategic	4.42	6%	-	-	-	-	**4.42**	**3%**
Applied	52.73	75%	16.55	45%	14.24	23%	**83.51**	**49%**
Adaptive and Technology Validation	3.05	4%	15.79	43%	34.21	53%	**53.05**	**31%**
Technology Dissemination	2.54	4%	0.80	2%	3.05	5%	**6.39**	**4%**
Socio-economic Research and Studies	4.44	6%	1.3	4%	4.69	7%	**10.44**	**6%**
Institutional Development/Networks	3.5	5%	2.38	6%	7.86	12%	**13.74**	**8%**
Total	**70.67**	**100%**	**36.82**	**100%**	**64.05**	**100%**	**171.54**	**100%**
%	**41%**		**21%**		**37%**		**100%**	

Strategic research: the quest for solution of specific research problems. *Applied research:* application of scientific knowledge to the solution of practical problem. *Adaptive research:* development of technological packages using solutions to practical problems from applied research. *Technology validation:* on-farm trials to test applicability of technological packages to specific locations/situations.

Graph 3: Amounts of funds allocated by research type per periods

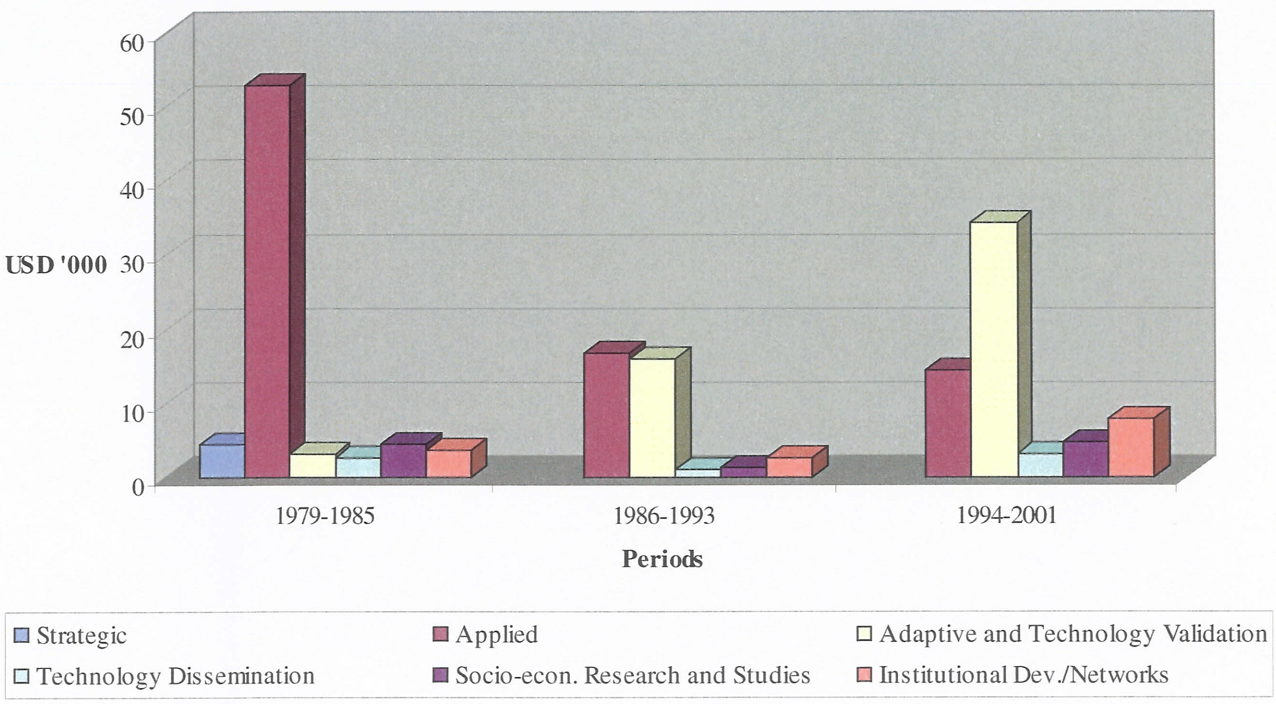


Table 2: Classification of TAGs per geographical area by value (in USD million)

Classification	*Africa*		*Asia/Pacific*		*LAC*		*NENA*		*Global*			
	USD	*%*	*USD*	*%*	*USD*	*%*	*USD*	*%*	*USD*	*%*	*Total*	*% of total*
1. Crops/cropping systems	25.5	36	15.7	55	12.2	68	26.1	53	3.3	62	82.9	48
2. Livestock Production System	9.6	14	3	10	1.7	9	7.3	15	0	0	21.7	13
3. Natural Resource Management	13.5	19	1.5	5	0	0	3.4	7	0	0	18.5	11
4. Integrated Pest Management	19.6	28	0.5	2	2	11	6.5	12	1	20	29.6	17
5. Post Harvest Management System and Value Addition	0	0	3.3	11	0	0	0.4	1	0	0	3.7	2
6. Technology related Socio-Economic Research	1.6	2	3.1	11	0	0	1.6	3	0.9	18	7.3	4
7. Technology Related Institutional Development and Policy Reform	0	0	1.6	6	1.9	10	4.2	9	0	0	7.8	5
TOTAL	69.9	100	28.8	100	17.8	100	49.6	100	5.3	100	171.5	
% of total funds by region		41%		17%		10%		29%		3%		100

Chart 1- Proportion of TAG funds per geographical area

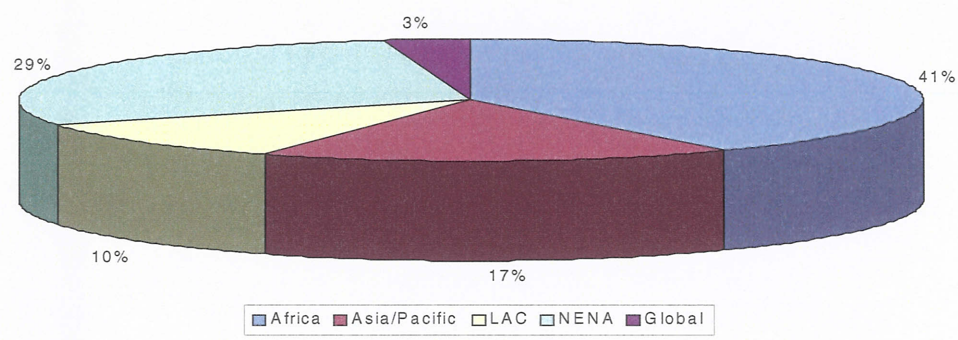


Table 3: Thematic focus per region

Classification	*Africa*	*Asia/Pacific*	*LAC*	*NENA*	*Global*	*Total*
1. Crops/cropping systems	31%	19%	15%	31%	4%	*100%*
2. Livestock Production System	44%	14%	8%	34%	0%	*100%*
3. Natural Resource Management	74%	8%	0%	18%	0%	*100%*
4. Integrated Pest Management	66%	2%	7%	22%	3%	*100%*
5. Post Harvest Management System and Value Addition	5%	79%	5%	11%	0%	*100%*
6. Technology related Socio-Economic Research	23%	43%	0%	22%	12%	*100%*
7. Technology Related Institutional Development and Policy Reform	0%	21%	25%	54%	0%	*100%*

63. The large majority of TAGs are regional in nature, i.e. they cover more than one country. Less well recognized, is the fact that several are national. That is, there have been TAGs under which partnerships and field level activities only took place in one country (such as India, Bangladesh).

64. According to the database, less than 5% of TAGs approved by IFAD over the years have been classified as "global", considered as "inter-regional". However, if one applies such a definition, then fully 19% of the sample TAGs can be considered "global." This calls for a more precise geographical definition of the TAGs.

65. AR&T TAGs have been unevenly distributed in terms of country of implementation. Of the 89 countries worldwide where they have been implemented, 57 have received one to four TAGs, 26 have received between five to nine TAGs, and only six have received more than ten TAGs (Table 4).

66. The number of participating countries in the TAGs ranges from one (e.g. TAGs 167, 167a, 181, 263) to 15 or 16 (e.g. TAGs 264, 332, 361) with an average of five countries per TAG. In those TAGs where there are many participating countries, on occasion, IFAD funding has been earmarked for activities in certain specific countries, while other donors provide support for the remainder (e.g. TAG 183a). Many participating countries can overburden management and threaten success of activities. This is especially the case when objectives are complex, and a number of institutions are involved. It is less of a problem where objectives are relatively simple, as under the highly effective TAG 361-IPGRI, which involved 13 countries. It could be argued that with relatively complex objectives involving multi-institutional programmes, coverage should be limited to four countries to maximize effectiveness.

3. Distributional Profile of the Grant Funds

- **CGIAR vs non-CGIAR**

67. Table 5 shows that CGIAR centres have had a greater importance both in terms of value of grants received (62% of total USD value) and of number of grants run (67% of all grants). It is also CGIAR centres, IITA and ICARDA in particular, that have received the largest number of projects per centre (25 and 21 respectively) (Table 7). CGIAR centres have also received the largest grant amounts per centre (ICARDA and IITA with USD 22.5 million and 18.5 million respectively).

68. Regionally speaking, CGIAR centres have received most funds for the implementation of the TAGs in all regions, especially in the Asia/Pacific region (88%). The only exception is East Africa where CGIAR institutions have only received 18% of overall TAG funds for that area. Indeed, most of the TAGs allocated for the East Africa region have been granted to ICIPE, a non-CGIAR research centre based in Nairobi, that operates mainly in Eastern Africa. In the NENA and LAC regions the situation is more balanced out with half the funds going to CGIAR centres, and the other half to non-CGIAR centres. The TAGs that are global in nature (see Table 6), .i.e. that cover countries belonging to more than one region, have been granted to CIAT, IFPRI and CIP, all of them being CGIAR centres.

Table 4: Number of TAGs per country

Region	Number of TAGs		
	1-4	5-9	10-15
Africa	Zaire, Togo, Gabon, The Gambia, Rwanda, Zimbabwe, Malawi, Zambia, Chad, Liberia, Cape Verde, CAR, Burundi, Somalia, Djibouti, Eritrea, Sierra Leone, Equatorial Guinea, Guinea, Botswana, Lesotho	Mali, Benin, Cameroon, Ghana Côte d'Ivoire, Senegal, Niger, Ethiopia, Burkina Faso, Uganda, Tanzania, The Sudan	Nigeria, Kenya
Asia	Pakistan, Papua New Guinea, Malaysia, Sri Lanka, Pacific Islands, Bhutan, Cambodia, Laos	China, Indonesia, Nepal, Philippines, Thailand, Vietnam	Banglade sh, India
NENA	Armenia, Mauritania, Iraq, Iran, Turkey, Lebanon, Jordan, Kuwait, Oman, Qatar, UAE	Tunisia, Libya, Syria, Egypt, Yemen, Bahrain, S. Arabia	Morocco, Algeria
LAC	Mexico, Colombia, Venezuela, Brazil, Peru, Caribbean Islands, Argentina, Bolivia, Chile, Nicaragua, El Salvador, Guatemala, Honduras, Ecuador, Cuba, Suriname, Paraguay		
Total	*57*	*26*	*6*

Table 5: Number and value of approved AR&T TAGs by type of recipient

CGIAR/ non CGIAR	*Total number of grants received*	*Percentage of total*	*USD value of grants received ('000)*	*Percentage of total*
CGIAR	134	67%	106.156	62%
Non-CGIAR	65	33%	65.385	38%
Total	**199**	**100%**	**171.541**	**100%**

Table 6: Value of grants received per region by CGIAR vs non-CGIAR

Regions	*Total grant amount (USD '000)*	*Total grant amount (CGIAR) (USD '000)*	*Total grant amount (non-CGIAR) (USD '000)*	*%*		
				Total	*CGIAR*	*non-CGIAR*
Africa (total)	69.90	41.91	27.99	100%	61%	39%
West Africa	42.46	30.41	11.92	100%	72%	28%
East Africa	16.21	1.858	13.43	100%	18%	82%
Africa wide[50]	11.24	9.65	2.65	100%	76%	24%
Asia/Pacific	28.69	25.24	3.60	100%	88%	12%
NENA	49.64	24.73	24.91	100%	50%	50%
LAC	17.85	8.96	8.88	100%	50%	50%
Global	5.308	5.308	0	100%	100%	0%

[50] This category includes all the TAGs that cover countries both in East and West Africa, such as in the case of TAG 284-ILRI which has been implemented in Ethiopia, Kenya, Zimbabwe, Burkina Faso and in Côte d'Ivoire.

- **Institutional Distribution of Funds**

69. In general the range of average grant sizes for the Non-CGIARs (USD 0.19 to 2.58 million) is much wider than that of the CGIARs (USD 0.46 to 1.96) (Tables 11 and 12). However, if one considers average grant size for the two groups the difference is insignificant.

70. In terms of distribution of funds amongst the centres belonging to the CGIAR, most of the funds have gone to a relatively small percentage of the centres (38% of the centres have been allocated 71% of the funds – Table 14). The same has occurred for those centres not belonging to the CGIAR: Table 16 shows that 32% of the centres have received 82% of the funds. This shows a certain concentration of funds allocations rather than an even distribution across institutions.

71. A closer look at the frequency of the grants received by those institutions that received ten or more grants (Table 15), shows that these institutions have been supported almost every year. It must be highlighted however that some of these institutions, received sometimes up to nine grants to develop one programme, as in the case of TAG 1-ICARDA, made up of nine different grants aimed at the development of the "Applied research on broadbeans in the Nile Valley". This approach was predominant in the early stages of the Grants Programme where an emphasis was placed on both upstream commodity-based research and downstream research. The funds granted were therefore used to cover a whole spectrum of activities. With an increasing focus now being placed on downstream research, the amount of funds needed have decreased markedly.

4. Sectoral Allocation and Trend of TAG Funds

72. All the TAGs undertaken by IFAD since 1979 were classified by the Evaluation under seven categories, and sub categories (Table 16 and Chart 2). It is important to note that in the process of grouping the TAGs, the team encountered difficulties with projects involving activities that fall under more than one category (for example, some TAGs contain elements of natural resource management and livestock production, others focus both on livestock production and social capital development). In these cases, and where the funds allocation was not clearly earmarked, the activity that corresponded to the dominant objective of the TAG was taken as a criterion for classification.

73. As is clear from the data presented, one half of all TAGs deal mainly with crops or cropping systems while only a quarter tackle issues related to livestock production systems and natural resource management. Varietal development for both crops and livestock has been given somewhat more importance than varietal management (Table 16). Within the crops category, a more detailed analysis of the types of crops on which most TAGs focus shows that cereals have the first place followed by legumes (see Table 17 and Chart 3). An analysis of the importance given to the various crops over time (Graph 4) shows that ever since 1979 a greater emphasis was placed on cereals with respect to other crops, particularly in the first years. In recent years legumes have begun to acquire a greater importance, especially vis-à-vis roots and tubers that have declined steadily ever since the end of the eighties. In the livestock category small ruminants are the main focus of the TAGs dealing with livestock, followed by cattle, and camels (Table 18).

74. An analysis over time (Graph 5) shows that starting from the late eighties the proportion of funds allocated to TAGs for crops decreased dramatically until reaching its low at the beginning of the nineties. This decline in emphasis runs parallel to an increase in the share of TAGs that focus more on livestock production systems and on integrated pest management, although in recent years crops have once again gained a prominent position. Although less hefty in terms of funds received, the importance gained since the mid nineties of TAGs dealing with technology related and socio-economic research, as well as the grants dealing with natural resource management and post harvest management.

Tables 7 and 8: Number and value of grants received – CGIAR vs non-CGIAR

Research Centre (CGIAR)	*Number of grants received*	*%*	*Grant amount in USD '000*	*% of total*
IITA	25	19%	22.51	21%
ICARDA	21	16%	18.55	17%
ILRI	13	10%	11.76	11%
ICRISAT	10	7%	8.89	8%
IRRI	10	7%	7.22	7%
WARDA	9	7%	7.08	7%
IFPRI	8	6%	6.07	6%
CIAT	8	6%	4.77	4%
CIP	8	6%	4.62	4%
ICRAF	6	4%	3.69	3%
ICLARM	4	3%	3.12	3%
CIMMYT	4	3%	2.36	2%
IPGRI	3	2%	1.98	2%
IIMI*	3	2%	1.84	2%
CIFOR	2	1%	1.70	2%
ISNAR	0	0%	0	0%
TOTAL	***134***	***100%***	***106.16***	***100%***

* Newly renamed IWMI.

Research Centre (non-CGIAR)	*Number of grants received*	*%*	*Grant amount in USD '000*	*% of total*
ICIPE	16	25%	16.34	25%
ACSAD	14	22%	12.70	19%
IFDC	6	9%	7.75	12%
CATIE	5	8%	6.42	10%
OAU/STRC	5	8%	5.17	8%
FAO	4	6%	5.00	8%
IICA	3	5%	2.30	4%
AOAD	1	2%	1.60	2%
CEDARE	1	2%	1.30	2%
CIHEAM	1	2%	1.25	2%
IDRC	1	2%	1.07	2%
IJO	1	2%	1.00	2%
INBAR	1	2%	0.90	1%
INFOSAMAK	1	2%	0.70	1%
CARDI	1	2%	0.50	1%
OSS	1	2%	0.43	1%
UNIDO	1	2%	0.40	1%
DLCO	1	2%	0.40	1%
RADHORT	1	2%	0.19	0%
TOTAL	***65***	***100%***	***65.39***	***100%***

Tables 9 and 10: Average grant size[51] per CGIAR/non-CGIAR

Research Centre (CGIAR)	*Average grant size*
IRRI	1.96
CIAT	1.80
ICARDA	1.73
CIP	1.49
IITA	1.33
ICRAF	1.18
WARDA	1.16
ILRI	1.11
IPGRI	1.04
ICRISAT	1.01
CIMMYT	0.92
CIFOR	0.85
IIMI	0.67
IFPRI	0.59
ICLARM	0.46
Overall average	***1.15***

Research Centre (non-CGIAR)	*Average grant size*
CATIE	2.58
OAU/STRC	2.50
FAO	1.90
ICIPE	1.63
CIHEAM	1.60
IFDC	1.6
ACSAD	1.59
INBAR	1.30
RADHORT	1.25
OSS	1.07
AOAD	1.00
IDRC	0.90
IICA	0.77
CEDARE	0.70
UNIDO	0.50
CARDI	0.43
IJO	0.40
INFOSAMAK	0.40
DLCO	0.19
Overall average	***1.17***

Tables 11 and 12: Distribution of TAGs (per number and value) for CGIAR centres

Institution	*n.*	*% of total n.*	*n. of grants*	*%*
IITA, ICARDA	2	13%	46	35%
IITA, ICARDA, ILRI, IRRI ICRISAT, WARDA	6	38%	88	66%

Institution	*n.*	*% of total n.*	*value of grants*	*%*
IITA, ICARDA	2	13%	41,1	38%
IITA, ICARDA, ILRI ICRAF, CIAT, IRRI	6	38%	76,1	71%

Tables 13 and 14: Distribution of TAGs (per number and value) for non-CGIAR centres

Institution	*n.*	*% of total n.*	*n. of grants*	*%*
ICIPE, ACSAD	2	11%	30	47%
ICIPE, ACSAD, IFDC, CATIE, OAU/STRC FAO	6	32%	50	78%

Institution	*n.*	*% of total n.*	*value of grants*	*%*
ICIPE, ACSAD	2	11%	29,0	44%
ICIPE, ACSAD, IFDC, CATIE, OAU/STRC, FAO	6	32%	53,4	82%

[51] Please note that in order to account for an average grant duration of 3 years, the number of grants allocated prior to 1989 were divided by three. For further explanations see section (a) above (paragraph 4).

Table 15: Frequency of grants received by the largest recipients

Research Centre	Year of funding
IITA	79, 80, 80, 81, 81, 82, 82, 82, 83, 83, 84, 84, 85, 85, 86, 86, 87, 88, 89, 92, 93, 94, 98, 99, 2000
ICARDA	79, 80, 81, 81, 81, 82, 82, 83, 83, 84, 86, 87, 88, 88, 93, 95, 96, 97, 98, 2000, 2001
ICIPE	80, 81, 82, 82, 83, 84, 85, 87, 88, 89, 95, 97, 97, 98, 99, 2000
ACSAD	80, 81, 82, 83, 84, 85, 86, 87, 88, 90, 91, 97, 2000, 2000
ILRI	80, 81, 82, 83, 84, 85, 88, 94, 97, 97, 98, 99, 2001

Table 16: Classification of AR&T TAGs

Classification	*Value of grants*		*Number of grants*	
	Value (USD '000)	%	*n.*	%
1. Crops/cropping systems	***82 860***	***48%***	**96**	**47%**
1.1 varietal development	46 834	27%	64	31%
1.2 varietal management	36 026	20%	32	16%
2. Livestock Production System[52]	***21 716***	***13%***	**27**	**14%**
2.1 nutrition	600	0%	1	0.5%
2.2 disease management	4 425	2%	5	2.5%
2.3 varietal management	16 691	10%	21	11%
3. Natural Resource Management	***18 463***	***11%***	**20**	**10%**
3.1 Soil/fertility management	5 555	3%	6	3%
3.2 Water management	5 368	3%	7	3.5%
3.3 Agro-forestry	7 540	4%	7	3.5%
4. Integrated Pest Management	***29 616***	***17%***	**31**	**16%**
5. Post Harvest Management System and Value Addition	***3 695***	*2%*	**5**	**3%**
6. Technology related Socio-Economic Research	***7 350***	*4%*	**14**	**7%**
7. Technology Related Institutional Development and Policy Reform	***7 841***	*5%*	**6**	**3%**
TOTAL	***171 541***	***100%***	***199***	***100%***

Table 17: Crop emphasis of TAGs

Types of crops	*Number of TAGs dealing with crops*	*%*	*Value of TAGs dealing with crops (USD million)*	*%*
Cereals	54	56%	46.9	56%
Legumes	17	18%	17.2	21%
Roots and Tubers	16	17%	13.9	17%
Perennial/Tree crops	7	7%	2.7	3%
Plant genetic/biodiversity	2	2%	2.2	3%
Total	***96***	***100%***	***82.9***	***100%***

[52] *This category includes honey bee, sericulture and fish culture activities aimed at micro enterprise development.*

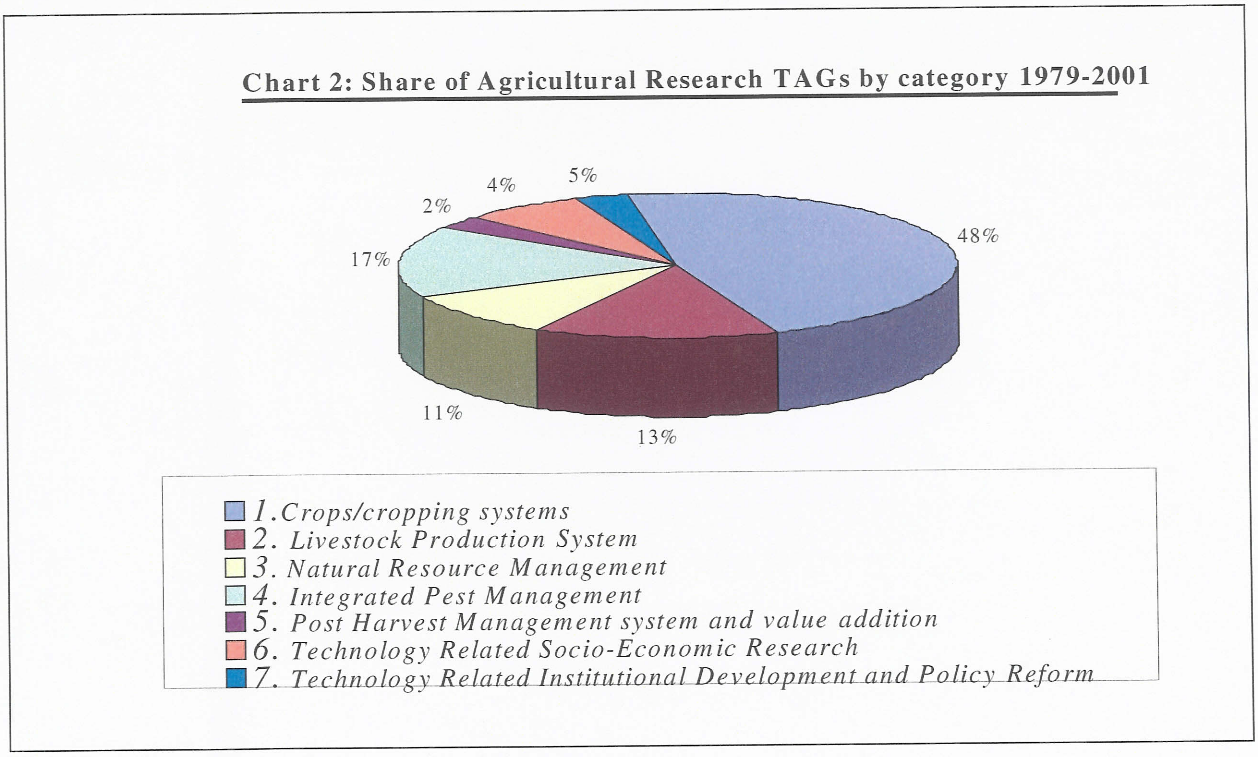


Chart 2: Share of Agricultural Research TAGs by category 1979-2001
48%
13%
11%
17%
2%
4%
5%
1.Crops/cropping systems
2. Livestock Production System
3. Natural Resource Management
4. Integrated Pest Management
5. Post Harvest Management system and value addition
6. Technology Related Socio-Economic Research
7. Technology Related Institutional Development and Policy Reform

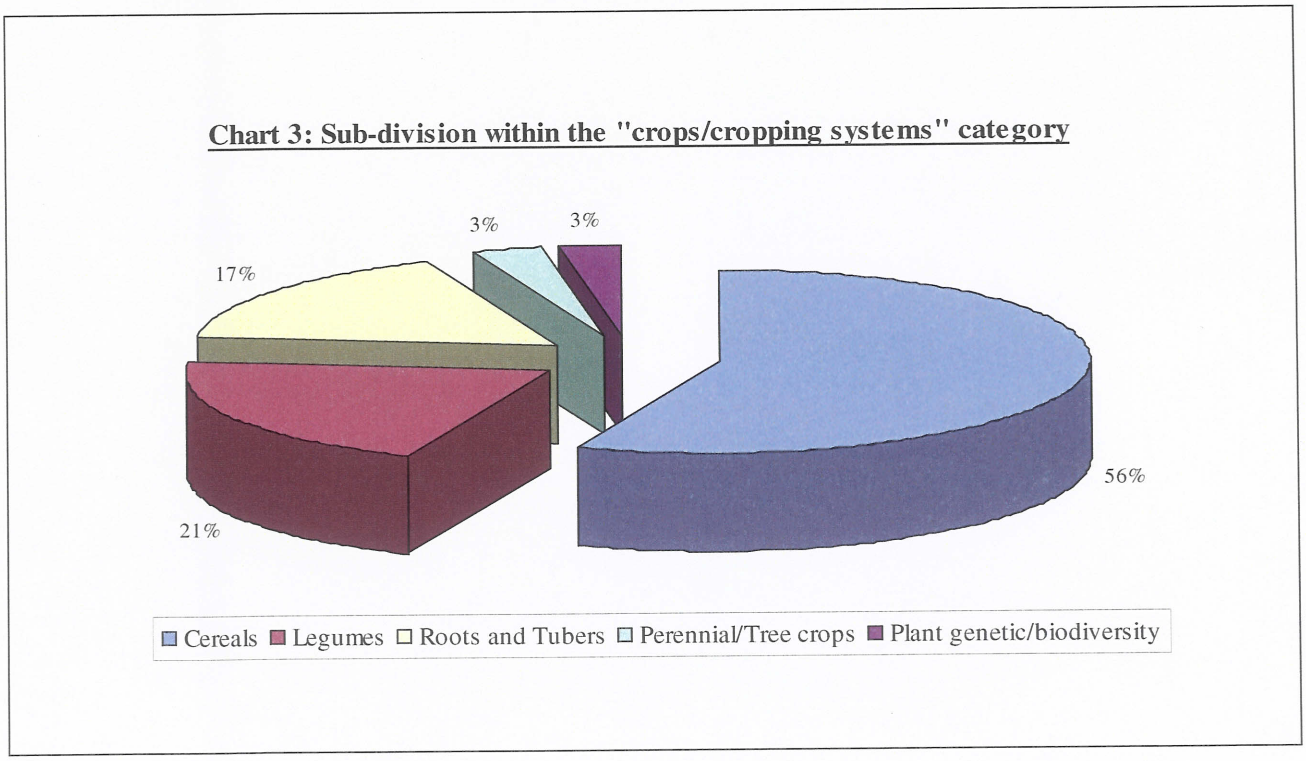
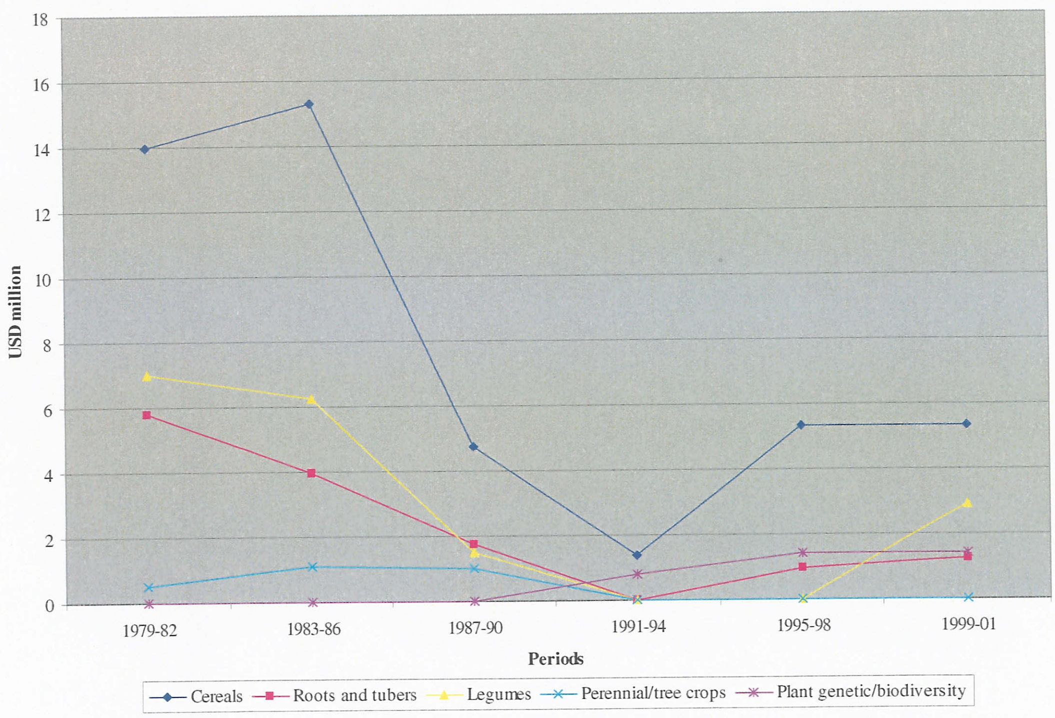
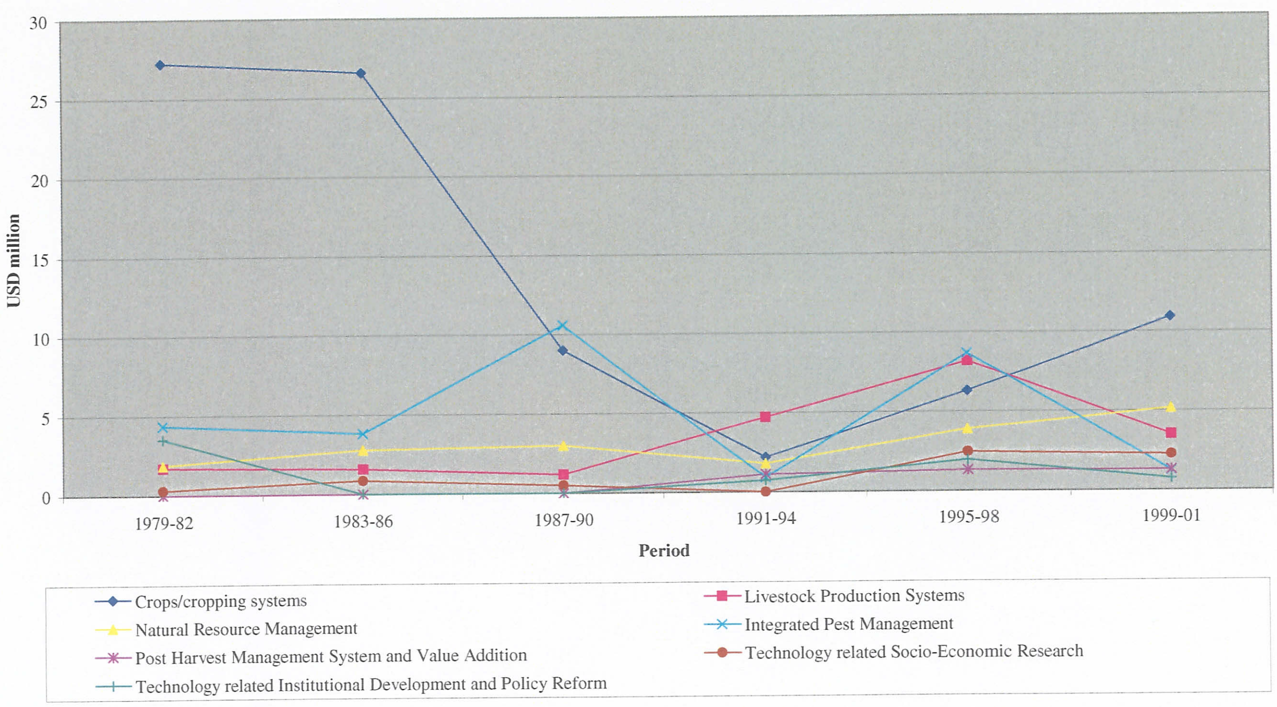


Chart 3: Sub-division within the "crops/cropping systems" category
56%
21%
17%
3%
3%
Cereals
Legumes
Roots and Tubers
Perennial/Tree crops
Plant genetic/biodiversity

Graph 4: Funds allocated for each type of crop per period



Graph 5: Funds allocated for each category by period



75. When a broader three period classification is taken, corresponding roughly to internal policy shifts in IFAD (Table 19), in the early period crops had a substantial weight in the overall allocation of AR&T funds (71% compared to the other sectors). Livestock has grown steadily ever since the early period from a low of 5% of overall funds allocated to 21% in the last period analyzed. The category of Technology related Socio-Economic Research has also been given a greater weight, having passed from 1% of total AR&T grant allocation to 9% in the last period.

5. Management of TAGs

76. In terms of the internal management of the TAGs, throughout the years most TAGs (87%) have been managed by the Technical Division (PT). With the increasing trend of regional management of TAGs by the regional divisions themselves however, that started off in 1997, the proportions are likely to level out. To date, the regional divisions manage 16 grants.

6. Duration of Grants

77. In early years TAG funding was approved on a year-by-year basis. A 1989 Board document discontinued this practice and commenced approval of a three year programme. After that date, most TAGs were granted for a three-year span, even in instances where the original request was for a longer or shorter period. But there are exceptions of TAGs for two years (TAG 364-CEDARE) or even five years (TAG 216-ACSAD). Several proposals clearly indicate an upfront expectation of two or more phases of three years each. Extensions are not uncommon, with 22% of TAGs having one or more extensions.

78. There are at least two reasons for subsequent phases: the first is to continue a worthwhile programme of research, sometimes identified from the beginning as such, or, at times considered as promising as the first phase(s) unfolds. The second reason, and the most common, is to complete the activities that could not be finished off during the first phase(s). In this last case, there is the hope, that the subsequent phase will improve achievements and impact, as in the case when linkages with IFAD loan projects were intended, but not implemented. Although, strictly speaking, not sequential phases, many TAGs are also more loosely interlinked. Examples of such TAG clustering are provided by TAGs to IRRI on rice research, by those to CIAT on cassava, by those to ICLARM on aquaculture, and so on. More often than not, such relevant preceding TAGs are not recognized in the EB proposals, again obscuring the linkage and the complementarity of IFAD supported research.

7. Phasing of Grants

79. More than half of the research programmes funded by the TAGs are made up of more than one grant, or "phase". Examples include: TAG 1 and its phases 1-A to 1-H; TAG 40 and its phases 40-A to 40-F; TAG 136 and its phases 136A, to 136-C, and so on (see Appendix 9 for a full list of all grants)[53].

[53] It is important to bear in mind that in formal terms the denomination of phases changed after 1996. So while before that date, every extra grant that contributed to a single programme was followed by a letter (for example, CIAT's research on field beans consists in grant 33, 33a, 33b, 33c, and so on), after 1996 all new grants, even if contributing to the same programme, were given a separate number (for example TAGs 216-ACSAD and 489-ACSAD in the NENA region, are phases 1 and 2 respectively of the Camel Applied Research Network Programme). This obscures the sequential nature of the research.

Table 18: Sub-divisions within the "livestock" category

Types of livestock	*Number of TAGs dealing with livestock*	*%*	*Value of TAGs dealing with livestock*	*%*
Small ruminants	6	22%	6.7	31%
Cattle	10	37%	6.2	29%
Camels	4	15%	4.0	18%
Seri- and api-culture	3	11%	3.6	17%
Fish culture	4	15%	1.2	5%
Total	***27***	***100%***	***21.7***	***100%***

Table 19: Distribution of TAGs per period

Classification	*Total grants per period*					
	1978-85		*1985-93*		*1994-2001*	
	value	*%*	*value*	*%*	*value*	*%*
1. Crops/cropping systems	50.7	71%	13.6	37%	18.6	29%
2. Livestock Production System	3.3	5%	4.7	13%	13.7	21%
3. Natural Resource Management	4.7	7%	4.8	13%	9	14%
4. Integrated Pest Management	7.6	11%	11.5	31%	10.4	16%
5. Post Harvest Management System and Value Addition	0	0%	0.7	2%	3	5%
6. Technology related Socio-Economic Research	0.9	1%	0.8	2%	5.7	9%
7. Technology Related Institutional Development and Policy Reform	3.5	5%	0.7	2%	3.6	6%
TOTAL	**70.7**	**100%**	**36.8**	**100%**	**64**	**100%**
% of total TAGs	**44%**		**24%**		**33%**	

Table 20: Average grant size[54] by region

Region	*Average Grant Size*
Africa	1.55
Asia/Pacific	1.18
LAC	1.37
NENA	1.6
Global	1.06
Total	**1.35**

[54] Please note that in order to account for an average grant duration of 3 years, the number of grants allocated prior to 1989 were divided by three.

80. Whilst multiple phasing may have a rationale in some cases, a strong dominance of TAGs with repeated phases limits opportunity for financing innovative new ideas through stand alone TAGs and deflects attention from downstream research activities which is meant to be the main emphasis of the AR&T programme. It also limits opportunities for creative institutional arrangements with newer partners, e.g. NGOs, for location specific farmer oriented research.

8. Size of Grants and Cofinancing

81. The size of individual phases of AR&T grants has varied between USD 150 000 (TAG 163-IIMI) and USD 4 million (TAG 213-FAO), with an overall average size of USD 1.35 million (see Table 20). Currently, IFAD staff has to identify an amount at the concept note stage. While it is important to have some idea, it should not be binding. Staff feel that there is an informal limit presently on maximum grant size of about USD 1.5 to USD 2 million per grant. Multiple phasing, can of course get around this, but requires additional time spent by both staff and the grantee. There is no evidence /complaint that the size of grants is an issue in the TAG programme. In the review sample (see Chapter IV for more information on the sample), 39% of TAGs had been co-financed. While cofinancing has definite advantages in making more funds available, it also increases management's reporting burden and sometimes brings in donors whose agendas differ from those of IFAD. This type of problem appears to exist in several of the reviewed grants.

IV. EVALUATION FINDINGS

A. Research Priorities

82. Whose priorities or agenda is driving the research to which IFAD is contributing? Are research priorities being set according to international institution and researcher interests and reward systems? Are they set according to national research plans and priorities of collaborating country NARS? Is research responsive to IFAD's own priorities? How much say do farmers have in priority setting?

1. IFAD's Research Priorities

83. For almost the first two decades of its operation, IFAD's agenda for the AR&T programme was open to interpretation. In June 1997, a TRC on the Draft PMD Guidelines on AR&T TAGs acknowledged the need for an overall policy and strategic framework for TAGs, to provide, among other things, *a basis for defining priorities for selection of AR&T TAGs across competing demands.*[55] While the Guidelines are a definite step in that direction, the policy and strategic framework has still to be provided. The review found unclarity among some grant recipient organizations as to specific IFAD research priorities, although it was noted that IFAD's poverty agenda in research is clearer than in the past. In practice, overall while the existing selection procedures among grant proposals have provided a good screening mechanism a cohort of proposals research priorities appear still to be established on a case-by-case basis, with chance and individual factors playing a role in which type of research is financed and which is not. There are also clear regional division differences in priorities, some matching the existing AR&T TAG selection criteria better than others.

2. General Types of Priorities in TAGs

84. Review of TAG documents show three general types of priorities, sometimes combined in a single research project funded[56]:

[55] PT, Minutes of the TRC of 13 June 1997 on Draft PMD Guidelines for AR&T TAGs.
[56] There are a very small number of TAGs which fit neither classification (such as the new headquarters building for ICARDA – TAG 89-ICARDA).

(i) *Technical priorities* – directed to overcoming specific regional or global constraints in cropping, livestock, natural resource management, integrated pest management and other fields;
(ii) *Support priorities* – directed at overcoming institutional capacity constraints or methodological constraints, which affect the quality of research or its appropriateness to IFAD's poverty mandate and policies. Examples here are participatory research, multidisciplinary research, gender concerns and technology related training.
(iii) *Policy and strategy priorities* – a smaller number of TAGs or TAG components that are clearly directed at regional or global policy issues about which IFAD is concerned.

3. The Process of Priority Setting for Research Supported by IFAD

85. Most documents reviewed reveal an interaction between the research agenda being pursued by IARC, which many times also reflects concerns of NARS, and the agenda of IFAD or other donors. The evaluation survey asked grant recipient organizations how priorities had been set. Almost all claimed that priority setting process had involved consultation with farmers as well as diagnostic surveys with a multi-disciplinary team. The responses of CGIAR and non-CGIAR recipients were very similar on these points. However, whereas fully 86% of CGIARs claimed to have collaborated with IFAD in priority setting, only 44% of the non-CGIARs did so. These results underline the obvious – that usually CGIARs have a closer working relationship with IFAD, which also gives them an advantage in selection.

86. The extent of farmer consultation claimed by IARCs did not match information from proposals and documents. Only one proposal in the review sample showed clear evidence of having consulted farmers beforehand and of being directly farmer demand-based. This was TAG 330 (IPM in Southern Asia), which developed directly from a consultation with farmers from the village of Ashta in India, though with a ten-year time lag between their request for help and TAG start-up. The difference between the two sources of information (documents and institutional responses) could be due to the fact that much of this consultation may have occurred during an earlier stage of research, since most noted that the proposal did build on previous research experience. Or, it could have occurred during the early stages of TAG implementation, when research priorities were defined in greater detail, based on surveys and consultations, as well as other factors.

87. A most unexpected finding was that in only about a third of cases did grant recipients acknowledge that the TAG supported research was already in the organization's Medium Term Plan. This is an apparent contradiction with the statement that almost all respondents saw the TAG research as a complete match with their institution's agenda. This can be explained by response bias. In some cases IFAD has played a clear directive role in establishing a specific research priority for the Programme. This is most evident in the NENA region, where there has sometimes been considerable up-front investment in preparation of a new proposal (as in the case of TAG 216-ACSAD on the Camel Applied Research and Development Network and TAG 364-CEDARE on The Development of a Regional Strategy for the Utilization of the Nubian Sandstone Aquifer System.).

B. Trends in Research Approaches

88. Certain trends are evident in the research approach of the Programme from 1979 to the present. The projects approved show increasing concern about poverty, about sustainability of the environment, and more specifically about major production systems in arid and semi-arid regions of the world. Poverty concerns have led to other changes in the content and approach, particularly in newer TAGs. These changes have been positive in terms of the IFAD mandate and priorities. For review purposes, the dividing line between the "old" and "new" TAGs was taken as 1998 to coincide with approval of the new guidelines

for AR&T TAGs.[57] However, the evidence argues that, in practice, the trend has been more gradual: **the Guidelines served to legitimize what was already happening, rather than to break new ground**. The below discussed conclusions should be considered preliminary, since none of the new TAGs are completed, only a small number of newer grants could be reviewed.

Trend 1: Greater Focus on Technology that is Appropriate to Poorer Farmers

89. In earlier years, poverty orientation of research was assumed primarily on the basis of type of crops (such as cassava, plantains, faba bean) or livestock (such as ruminants) on which the research was conducted. This research was *broadly* relevant to the poorer farmers, but sometimes failed to ensure adoptable technology packages because it was not appropriate. Major constraints of poorer farmers, such as lack of access to fertilizer, pesticides, good quality soil, and water, were not always recognized. An early illustration is TAG 1-ICARDA (Applied Research on Faba beans in the Nile Valley). While this early TAG should be acknowledged for its multidisciplinary and participatory approaches as well as its positive impact on children nutrition, the technology packages proposed were based on intensive use of costly inputs such as fertilizers, insecticides, fungicides and herbicides and also assumed timely availability of water. These packages more suited to needs of the medium income farmers who could afford all the necessary inputs, but excluded the poorer ones.

90. The newer TAGs are more aware of the need to match research outputs to intended end users. Therefore the first step tends to be the development of a better understanding of the targeted poorer farmers, to ensure that research undertaken is compatible with their resource base and their agricultural practices and experience (discussed under social science research, below). Increasingly, they are also making better use of the poor farmers' wealth of traditional "survival" knowledge of what works in their environment. As a result, TAGs such as 320-FAO (Adaptive Research on the Tropical Bont Tick) and 330-ICRISAT (IPM in Southern Asia), took indigenous knowledge, practice and physical technology into account. Several newer TAGs are ensuring that poorer farmers even have an input into defining the research agenda. One way this occurs is through involving farmers in varietal selection. Overall, 11% of sample TAGs demonstrated farmer input into varietal selection as under TAGs 318-CIAT (Development and Transfer of Improved Cassava Genetic material) and the ongoing TAG 457-IITA (Improved Yam Technology Development in West Africa). All these factors tend to ensure that poorer farmers will both want and be able to afford the research outputs.

Trend 2: A Shift of Focus from Crop Improvement to Crop Management Research

91. Early TAGs, such as those for rice research at IRRI and for cassava research at IITA, contributed to the long-term varietal development programmes of the CGIAR institutes. Over the years, there has been increasing recognition that the use of improved germplasm must be combined with appropriate management practices to maximize benefits for farmers. At the same time sustainable management of natural resources has emerged as an important area requiring greater attention. As a result the newer TAGs are helping to integrate work on development of improved varieties with sustainable crop/production management practices taking a systems perspective. This has included a greater emphasis on agro-ecological characterization through soil/land capability analysis, attention to water availability and to understanding of climatic changes, to allow addressing issues related to stability of production in rainfed environments and efficient use of natural resources. Some examples are TAGs 485-ICARDA (Management of Natural Resources in the Arabian Peninsula), TAG 364-CEDARE (Development of a Regional Strategy

[57] PMD, *Guidelines for Agricultural Research and Training Technical Assistance Grants,* Post-OSC Version, Rome: IFAD, 09 December 1997 (internal document). The review has found this document to be confusing and ambiguous, but it nevertheless makes clear certain changes in emphasis which have been noted. Recommendations for strengthening are discussed later in the report.

for the Utilization of the Nubian Sandstone Aquifer System), TAG 535-IFDC (Soil Fertility Management in Sub-Saharan Africa).

Trend 3: Increased Attention to Technology Dissemination and Use

92. Traditionally, agricultural research has been concerned with technology development. In the case of IFAD TAGs, the emphasis has increasingly been placed on the later stages of the development process. There has been more attention to technology validation, using on-farm trials, to test the applicability of technological packages to specific locations or situations. This still remains the central focus. But some newer TAGs, such as TAG 330-ICRISAT (IPM in Southern Asia), TAG 362-ACSAD (Rainfed Agricultural Technology Development in the NENA Region), TAG 411-CIP (Integrated Management of Potato Late Blight Disease), TAG 488-WARDA (Development of Rice Technologies in West Africa), TAG 531-ICLARM (Community Based Fisheries Management in South and Southeast Asia), are even moving beyond technology validation to looking at technology dissemination issues, perhaps in an effort to show on-farm impact of research. As a result, they are contributing to developing effective dissemination strategies, conducting research on technology dissemination mechanisms, and preparing related modules and materials for extension services. In some instances, IARC scientists are getting closely involved in dissemination-related work, e.g. TAG 263-IRRI (Rainfed Rice Production FSR Phase II), giving rise to questions as to whether this represents best use of IARC expertise, and how far downstream IARCs should go. Other IARCs are extending their activities into dissemination, through forging new partnerships, especially with NGOs and, less frequently, the private sector. This trend has brought with it a greater interest in communication support, strengthening of farmer organizations, market studies and group-based processes.

Trend 4: Increasingly Active Involvement of Farmers in the Research Process

93. As IARCs are becoming more aware of IFAD's interest in farmer participatory trials, the newer TAGs are also stressing it more. Several, such as TAG 361-IPGRI (Programme for the Sustainable Use of Coconut Genetic Resources) and TAG 411-CIP (Integrated Management of Potato Late Blight Disease), are giving farmers a more meaningful participatory role and involving them in decision-making. The small new TAG 543-ENDA (Evaluating the Impact of Research Partnerships), illustrates a research model with equal partnership between farmer and scientist, each learning from the other. TAG design in the review sample often promises farmer participation in the research, but this often faces challenges during implementation, or is done inappropriately due to difficulties in getting researchers to the field and lack of incentives on all sides.

Trend 5: An Increase in Multidisciplinary and Multi-institutional Approaches

94. Multi-disciplinary and multi-institutional research in the TAG programme actually dates back to TAG 1-ICARDA. However, the newer TAGs are giving more attention and funding to multi-disciplinary research, and especially socio-economic research than was done in the past. The trend is based on recognition that such research can generate information, which will help to guarantee more appropriate technologies and a better adoption rates (see section on socio-economic research below). While in earlier years, this type of research was often a fringe activity, it is now better integrated with core biological components. More concern with multidisciplinary research, in turn leads to a search for new kinds of partners, who could provide the expertise that IARCs were sometimes missing, such as Universities, NGOs, private sector and community based organizations. This has been of particular importance where the field research has to be conducted in remote and inaccessible areas, where even extension systems do not operate.

95. In spite of positive trends, there are still at least two noticeable weaknesses in the multidisciplinary focus of many TAGs. One is cost-benefit analysis. It appears to be rarely performed up front (found in only about 11% of TAGs). A contributing factor may be the shortage of suitable skills at IARCs level, which was noted by IARCs responding to the survey. But there are a few good examples such as TAG 321-IICA (Eradication of the Carambola Fruit Fly, ongoing). The second notable weakness is in policy research, particularly policy constraint analysis to ensure that research outputs can be disseminated and adopted. A lack of policy level research and action has threatened the impact of some otherwise promising TAGs (e.g. TAG 386- ICIPE on Integrated Pest Management).

Trend 6: Increasing Attention to Gender Issues

96. About half of the reviewed EB proposals for TAGs (mostly of newer vintage) contain some mention of women or gender issues, sometimes as a major part of the rationale (e.g. TAG 318-CIAT on the Development and Transfer of Improved Cassava Genetic material, and 332-IDRC, on Bamboo and Rattan). The original proposals submitted by IARCs rarely do so, which could be why the gender focus is often lost during implementation. The general tendency in most TAGs seems to be to assume a fairly rigid and universal division of labour: men are in charge of production, and women deal with post-harvest processing and enterprises. There is no evidence, for instance, that the older TAGs that dealt with small livestock production, gave attention to women's related role (as in the case of TAG 192-CARDI on Sheep Production Systems in the Caribbean). But the few post-harvest technology components and food consumption or nutrition research activities *have* recognized women's role (even in the case of early TAG 40-ILCA on Arid Zones Livestock Systems).

97. Several newer TAGs seem to be taking gender issues more seriously in agricultural production as well as in post-harvest activities. One of these is the ongoing global TAG 411-CIP, on potato late blight disease, which conducted such analysis in all participating countries, requested special training in gender issues from CGIAR, and is truly gender mainstreamed in all aspects. Both it and TAG 318, included women in the technology selection process. TAG 330-ICRISAT also involved women's traditional technology expertise in the development of IPM solutions for management of pulse pests in Southern Asia. Overall, there is some indication of a trend toward a more integrated genuine appreciation of gender issues among some IARCs, but not others.

98. The above six design trends are generally in line with the development of the overall IFAD approach, as evidenced in loan projects, and with general international research trends. But they also raise some important issues that IFAD needs to address. First, some recent AR&T TAGs are becoming virtually indistinguishable from NGO/ECP grant financed pilot projects apart from the IARC coordination role and the size of the grant involved (usually around USD 1 million instead of under USD 100 000, as under the NGO/ECP). Secondly, there is indication that some IARCs are much more comfortable with certain new approaches, such as multi-disciplinary research, new research partnerships, particularly with NGOs, farmer managed research and gender mainstreaming in research, than are others, who tend to be more traditional. This argues for greater sharing of best practice and learning on such approaches. Thirdly, the highly localized research activities that are now taking place under some TAGs, necessarily place more responsibility on NARS, NARES (and NGOs where they are involved), therefore increasing the need for both adequate allocation of funding to such partners and related capacity building. This also raises the question of the comparative advantage of IARCs versus national institutions and the optimum use and combination of IFAD loans and grants.

C. Main Features of Design

1. Quality of Design

99. By the time the AR&T proposals are presented to the EB, they have normally benefited from the input of IFAD staff as well as the IARC, and often NARS and consultants. Strictly in design terms, without subjecting them to the test of implementation, the large majority of the EB submissions (over three quarters) are well presented proposals in terms of rationale, objectives, description of main components and core research, extent of integration of socio-economic research, institutional arrangements and M&E arrangements. Most are internally consistent and appear implementable. Less than a quarter of the proposals were rated by the review as marginally satisfactory or unsatisfactory. A frequent reason for a poor rating was that they were overly ambitious in terms of numbers of countries and objectives, were internally inconsistent, or, the M&E arrangements were not acceptable. When CGIAR and non-CGIAR were compared, it was found that those of CGIAR applicants were usually better.

2. Differences between the Original and EB Proposals

100. The desk review of TAG reports compared original and EB versions of the submitted proposals. Many exhibited notable differences. A small proportion had significant differences, in geographic coverage (the number of countries, or which regions within countries – e.g. TAG 263-IRRI, which originally proposed activities in both India and Bangladesh, but only India was proposed to the EB). Another few have differences in the intended population focus (as under TAGs 216-ACSAD on the Camel Applied Research and Development Network, and 332-IDRC on the Development and Transfer of Technology of Smallholder B&R), the specified objectives, or types or numbers of activities to be implemented (TAGs 362-ACSAD on Rainfed Agricultural Technology Development in the NENA Region). Most often, the EB versions have reflected a clearer poverty focus and have inserted plans for linkages to IFAD investment projects, which were not present in the original. Post-harvest technology components have also been added in several instances. In a few cases (as under TAG 183-ICRAF on Agroforestry Research in West Africa) there were as many as three different sets of objectives in the documentation: those of the original proposal, those of the EB, and those stated in the final report. The latter appeared to be a retroactive rationalization of activities actually implemented. In another unusual case, the TAG project was "renegotiated" between EB approval and its start-up some two years later "to meet government needs" with resulting design changes (TAG 167a-ICLARM – implemented only in Bangladesh).

101. Although implementation sometimes followed the EB proposal, in spite of earlier differences (as under TAG 148-IRRI on Rainfed Rice Production), more often the grantee appeared to compromise, or even follow the original proposal. A notable number of TAGs – probably around two thirds – were found to have made fairly significant changes in the TAG project (as defined by the EB proposal) during implementation. Some of these have clearly been agreed upon with IFAD, and/or have reflected circumstances like budget shortfalls, as when co-financing has not materialized (TAGs 256, 256a –IICA on the Development of South American Camelids), delays in start-up (TAG 320-FAO-IICA on the Control of the Tropical Bont Tick), or delays during implementation (TAG 318-CIAT). Others appear to have occurred because of difference in agenda between IFAD and the grantee institution.

3. Proposed Implementation Arrangements and Partnership

102. **There have been various implementation arrangements proposed for TAGs**. All but one of the TAGs in the review sample, involved IARC partnership with NARS, but much less frequently with NGOs. Normally, the grant recipient IARC is the designated coordinating institution, with responsibility for programme execution, coordination and cooperation with various participating institutions, technical support and field monitoring. But there are occasional exceptions. One of the TAGs in the review sample

was eventually coordinated by a NARS, after a two-year period of renegotiations (TAG 167-ICLARM, which was implemented in only Bangladesh), with the IARC performing a planning, training and technical backstopping role. In a few other instances, the IARC is the executing agency, while coordination and management of activities is performed by a network (as in TAG 361-IPGRI on the Sustainable Use of Coconut Genetic Resources); or, the IARC coordinates activities, but implementation is managed either completely (TAG 192-CARDI on Sheep Production Systems in the Caribbean) or in part (TAG 307-WARDA on the Accelerated Diffusion of Rice Technology) by another organization, such as a University or an NGO, sometimes through sub-contracting arrangements.[58]

103. In a sizeable minority of the TAGs reviewed, the grant recipient IARC proposed to work closely with one or more other IARCs, with implementation responsibilities based on comparative advantage, but with IFAD funds disbursed to only one (for instance, TAG 318-CIAT, TAG 375-CIMMYT/IITA on stress tolerant maize in East, West and Central Africa; 306-ICARDA/CIMMYT on the creation of a Network on Durum Wheat Improvement). In other cases the grantee was clearly in charge, but receiving scientific support, as needed, from other IARCs (as in TAG 136-IITA on the Biological Control of Cassava Pests, where ICIPE and CIAT also undertook certain scientific collaborative activities, or TAG 183-ICRAF, where IICA and ICRISAT-ISC collaborated). Technical support is normally to be provided by the grant recipient IARC, sometimes supported by other IARCs, as above. In one of the sample projects (TAG 308-ICIPE on the Development of Sericulture and Apiculture Technologies) collaborative arrangements were set with key national institutes in China and India for technical support in sericulture and apiculture for research in Africa. Governance systems for institutional partnerships (such as steering committees, workshops, consultations) are discussed below under the section on partnerships.

104. An important gap in the proposals, is the usually inadequate information for assessing whether the institutions identified have competence and comparative advantage in the activities proposed[59]. The best example of such evidence in the sample TAGs was TAG 411-CIP, which attached an annex summarizing related competence of all proposed research partners, which should be used as a prototype. Weak institutional capabilities resulted in weak implementation performance of a number of the reviewed TAGs.

4. Resource Allocation

105. In the review sample, 46% of TAGs had been co-financed. Co-financing has definite advantages in making more funds available, which in many cases is essential for implementing the full programme. It also enhances chances of linkages with development projects of other donors. However, the downside of co-financing are increased management (financial, monitoring and reporting) costs and sometimes brings in donors whose agendas differ from those of IFAD. This type of problem appears to exist in several of the reviewed grants. The following resource allocation issues were furthermore observed:

- All TAGs do not specify funding to be directly allocated to NARS. A good example of where this is done is TAG-411, which is also highly unusual in allocating 66% of TAG funds directly to NARES, with very low HQ administrative costs.
- The allocation of resources to NARS is often very small – for example, only USD 2 000 under TAG 386-ICIPE; about 4 000 under TAG 264. This may not provide sufficient incentive for good performance, even when field research costs are fairly low as in this instance.
- Overheads rates have varied tremendously over the years, but have now been stabilized at 12.5% since 2000. However, an analysis of the budgets reveal ways of getting around this.

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[58] In the WARDA case, a sub-contract for the technology dissemination activities was given to the NGO Winrock International Institute for Agricultural Development which coordinated other private and public partners in this effort.
[59] PMD, *TAG Planning and Screening Procedures,* which appear to have become effective in May, 2000.

- Several TAGs include costs of IFAD supervision and/or technical support. This is viewed as a conflict of interest by some, and advantageous by others, given IFAD's financial constraints.
- TAGs rarely budget for M&E costs as a separate line item. If IFAD continues to be interested in impact evaluation of TAGs, this should be encouraged.

5. Proposed Monitoring and Evaluation Arrangements

106. **M&E in proposals**. The M&E arrangements provided for TAGs are largely "inconsistent." There are some excellent arrangements, some very poor and some simply non-existent. Not all proposals note M&E for TAGs, even among the more recent ones. Surprisingly the sample data do not show a clear trend towards more attention to M&E over the years. It is rare for funding to be earmarked for the purpose under the budget. Several TAGs approved in the eighties and early nineties focused entirely on impact evaluation (TAG 120-IFPRI on the Nutritional Effects of Cash Cropping, 167 and 167A-ICLARM, 284-ILRI on Trypanosomiasis Control Technologies in Tse-tse affected Areas), even using control situations, such as those of ICLARM. Others, such as TAG 183a-ICRAF, noted that part of the research to be conducted would be on impact. Participatory M&E has been a part of several TAGs, including TAG 411-CIP, TAG 309-FAO the establishment of a Regional Animal Disease Surveillance and Control Network, TAG 488-WARDA on the Dissemination of Rice Technologies in West Africa. Even negative impact has occasionally been flagged (as under TAG 320-FAO) although not as often as it should have been (as under TAG 167-ICLARM, where negative impact on fish traders was not identified, but it was taken into account under the next phase). Overall, no consistent pattern could be identified.

107. In a few cases, where the EB proposal made no mention of the subject, it was well dealt with by the original proposal forwarded by the grantee (such as TAGs 457-IITA). Nor does it necessarily follow that evaluations noted in design will also be implemented, although lack of related information and missing reports could be partly to blame for this impression The present review also found that in several cases neither proposal made mention of evaluations to be carried out, but they were actually done in practice, sometimes by IFAD (as in the case of TAG 362-ACSAD), seemingly often when a second phase was being considered. Therefore, any reference to M&E in the proposals has to be "taken with a grain of salt."

108. **Monitoring**, done usually by the grant recipient institution, has been primarily technical, done by the project agronomists, some of it apparently informal in nature. Occasionally, there has also been attention to monitoring of farmer emerging reactions, as well as to technical aspects, as in the case of TAG 307-WARDA. In this case, the proposal stated that the Programme Co-ordinator, with the help of field staff, was to be responsible for monitoring implementation progress during regular field visits. Data was also to be collected from rice farmers to assess their views on technologies being demonstrated. Log Frames, with monitoring indicators spelled out, have only been included in some of the newer TAGs such as TAG 386-ICIPE on pest management of vegetable cultivation in SSA, TAG 411-CIP, TAG 531-ICLARM (in the original proposal). TAG 308-ICIPE proposal noted that a set of monitorable indicators for both implementation and emerging impact monitoring were to be developed at start-up.

109. **Evaluation** has been proposed to be conducted in various ways – by outside experts, by IFAD, and by the grantee organization itself. No clear policy was found on this. Usually proposals provide little detail on the nature of the evaluations to be undertaken, and do not indicate funding, with a few exceptions (TAGs 256, 256A-IICA, TAG 412-IITA on the Biological Control Programme for the Cassava Green Mite). But it seems that individual field tests are evaluated much more often than the programme as a whole. Again, the evaluation in such cases is usually technical. Some TAGs have gone beyond this, as in the case of TAG 257-CIFOR (International Network for Bamboo and Rattan Research and Development Programme), notes three forms of evaluation in the IFAD proposal: (i) periodic evaluation of the progress and impact of individual research activities by the Working Groups; (ii) a project Analysis and Evaluation Workshop towards the end of PY2; and (iii) an external evaluation of the network, at the end of PY3, in

accordance with the evaluation scheme and indicators developed for the project. TAG 411-CIP clearly specified a participatory impact evaluation in the proposal, noting that the focus would be more than technical, to include evaluation of the adapted Farmer Field School model, and social and economic as well as technical data would be used. Where TAGs have been proposed purely for the purpose of evaluating IFAD projects (TAGs 120s, 301, IFPRI), or evaluating a strategy (TAG 167, 167a-ICLARM, which evaluated fish farming extension), or to compare a variety of strategies used in a given problem area (as in the case of *trypanosomiasis* control – TAG 284-ILRI), there are useful methodological and technical lessons for IFAD loan projects, but usually not extracted.

110. **Two M&E lessons.** The review of M&E has brought out two important issues. One is the need to consistently include at least a paragraph on M&E in the proposal, noting responsibilities and general focus, with funding earmarked for M&E in the budget. The amount could range from 4% to as 7% of total cost (the latter was earmarked under TAG 256-IICA). The second issue concerns impact evaluation, and duration of grants. This is often very difficult to do, particularly when the research is at an earlier stage, with little in the way of activities at the farmer or field level. However, even when products or activities with impact potential exist, it can also be meaningless, if the point of impact measurement takes place too close to the time of ongoing activities. It would measure short-term impact, but not sustainability of impact. As shown by TAG 167a, there can be a progressive loss of impact once activities stop.[60] The point was made by ICLARM in the original proposal of TAG 531, noting: "Assessment of the longer-term sustainability of the community based fisheries management introduced by the project would require a further impact assessment at least three years after completion of the project support." Obviously, this has implications for duration of TAGs.

6. Integration of Socio-Economic Research

111. **Methods**. As mentioned earlier, over the years socio-economic research has become both a more frequent and a better-integrated and utilized feature of AR&T grant projects. Even some earlier TAG proposals have included some socio-economic research, but these were confined to formal surveys. Surveys still remain the most common social science research methodology used by TAGs. But the range has widened recently to include: baseline, household, farming system, nutritional, demographic, KAP, KPP, key informant, and market surveys. Less frequent use is made of other types of social science research such as: participatory rural appraisals (PRAs), participatory natural resource mapping, focused discussion groups, direct observation and, collection of oral histories.

112. **Differences between IARCs**. The evaluation survey, as well as the field visits, confirmed that most of the research organizations that IFAD works with are now using socio-economic as well as biophysical research. But the responses also confirmed that considerable differences still exist between IARCs in their understanding of, and capacity for such research, as well as between CGIARs and Non-CGIARs. The best ones view socio-economic studies as an essential aspect of a farming systems approach to research, in that it helps to understand farmer needs, constraints, and potential for participation and adoption of technology. These IARCs are trying to build up in-house expertise. But other IARCs and many NARS, state that they do not have social scientists on staff. [61] This means that they have to widen partnerships at the country level, to include those institutes that do have social scientists on staff, or, use students for conducting studies. IARCs report that suitable social scientists are particularly difficult to find.

[60] This TAG actually has very interesting findings on impact, which are rarely captured by studies. They include findings on the extent to which fish farmers continued, and discontinued the recommended practices after extension stopped, findings on "second wave" adopters of technology, impact on fish consumption patterns, and some data on negative impact (on fish traders).

[61] While there is not enough information to arrive at reliable conclusions, responses suggest that perhaps livestock, fisheries and forestry focused IARCs are particularly lacking in such expertise. This may be because there is a long tradition of social research on cropping, focusing on technology adoption, dating back at least to the sixties.

Box 1: Some examples of the functions performed by social science research in TAGs.

⇒ *To provide background information* on production systems and production constraints of smallholders, in order to identify factors which need to be considered in technology development or local adaptation of technologies (e.g. TAGs 40-ILRI on Arid Zones Livestock Systems, 192-CARDI on Sheep Production Systems in the Caribbean, 263-IRRI on Sustainable Rice Farming Systems in Southern Asia, 306-ICARDA/CIMMYT).

⇒ *To identify farmers' technology (usually varietal) preferences*, in order to feed into biotechnical research (e.g. TAGs 318-CIAT on improved cassava genetic material, 457-IITA on improved yam technologies, 375-IITA/CIMMYT on disseminating stress tolerant maize).

⇒ *To identify indigenous technology or knowledge* which may be able to be upgraded and/or laterally disseminated (e.g. TAG 320-FAO on the control of the tropical bont tick in the Caribbean, 330-ICRISAT on IPM for pulse pests in Southern Asia, 361-IPGRI on the sustainable use coconut genetic resources).

⇒ *For cost-benefit analysis* of alternative approaches or technologies (e.g. TAGs 183-ICRAF on Agroforestry Research, 332-IDRC on the Development of Technologies for Bamboo and Rattan-based producers).

⇒ *To support policy and/or institutional change* (e.g. 309-FAO RADISCON, 485-ICARDA on the sustainable management of natural resources in the Arabian Peninsula).

⇒ *For benefits projection,* as where market studies are conducted (e.g. TAG 183-ICRAF, 332-IDRC).

⇒ *For impact analysis.* Several grants have been allocated entirely impact analysis, including the early TAG 120-IFPRI, which evaluated the income and nutritional effects of a shift from semi-subsistence to cash cropping (1984 approval), 332-IDRC, which conducted a variety of socio-economic studies on bamboo and rattan,[62] 531-ICLARM on community-based fisheries management, and 257-CIFOR/IDRC, which ear-marked the IFAD funding only for this type of research, while other donors funded other types of research.

113. **Capacity building**. The IFAD rationale (in the EB version of the proposal) has sometimes argued for including socio-economic research in order to build IARC and NARS capacity (e.g. TAG 257-CIFOR/IDRC). In line with this, TAGs have at times included social science research training (as in TAG 72-IITA on Plantain Production in Africa) or the hiring of social scientists for participation in the research activity (as in TAG 183-ICRAF).

D. Relevance of Research Objectives and Outputs

114. The stated *objectives* of the majority of the TAGs, as presented in the EB proposal, have been relevant to the needs of the rural poor, to the AR&T Programme goals, and to IFAD regional priorities and strategies. But relevance *of outputs* is much lower. Nor have the objectives and activities always remained the same as they were in the IFAD version of the proposal, particularly since the EB version is often quite different from the original. It is not uncommon to have a shift during implementation, often decreasing relevance. The evaluation noticed that the shift tended to be towards the original proposal of the IARCs.

1. Relevance to IFAD's Poverty Mandate

115. The review found that some 86% of TAG/EB proposals had stated *goals and objectives* with clear poverty relevance. But fewer TAGs actually generated technological solutions, which could be considered relevant to and adoptable by the poor. In those instances when outputs had actually been produced as intended, and a decision on relevance could be made, only about 60% of technology outputs were found to

[62] The TAG is one of very few which also included policy constraint analysis.

have clear relevance to the rural poor[63]. *In the remaining TAGs there were clear constraints to use of outputs by poorer rural farmers or others.* The gap between relevance of objectives and relevance of outputs is normally caused by insufficient understanding or attention by implementers to livelihoods and constraints of the poor. There has been improvement in this over the years through increasingly good integration of socio-economic research and farmer participation in the TAGs. Therefore, while the review did not find evidence to support the common belief that the earlier TAGs lacked a poverty focus in their goals and objectives, it *did* find a gap at the implementation level, which affects poverty impact particularly for earlier TAGs.

116. **Shift in relevance during implementation**. As noted in the above discussion on design, it is not unusual to have a change in the objectives and components of the TAG during implementation. In a small, but important minority of cases, the change has definitely been for the better – to reflect useful learning during implementation and to enhance poverty relevance (TAG 361-IPGRI).[64] Unfortunately, more often it has been the reverse, resulting in a decrease in poverty relevance. This is illustrated by TAG 362-ACSAD, where shifts during implementation, included: in the agro-ecological system focus, and from on-farm testing with use of implements available to farmers, to mainly testing on-station, using costly machinery, with the farmers' fields used only as controls. Or, under TAG 216-ACSAD, where the focus moved from a farming systems approach, which was to include consideration of alternatives to camel production and the interface between semi-nomadic herders and sedentary populations, to exclusive focus on camels and camel promotion.

2. Relevance to the AR&T Programme

117. The large majority of TAG designs were also relevant to the goals of the AR&T Programme. They dealt with problems of high priority to the poor, as noted. They had potential for linkage to IFAD's loan portfolio. The grantee institution had comparative advantage or competence in the research area, and often an already ongoing programme. Usually, there was a possibility of technology packages being generated in the medium term. There was potential for multiplier effects or replicability. Even some of the early TAGs met many of the criteria of 2000 PMD TAG Screening Criteria.

118. The few occasions where TAGs could not be considered as centrally relevant to the Programme are instructive. One TAG (364-CEDARE, on the Development of Regional Strategy for Utilization of Nubian Sandstone Aquifer System) effectively focused on developing a regional policy and strategy, with enormous relevance for the region, both to industry and farming. It is also very much in line with the PN regional programme focus on water scarcity (see below). IFAD may want to consider whether a special grant window may be opened for this type of research in order to support IFAD's policy-related goals. Another two TAGs, although having a cross-country technology transfer aspect, were primarily concerned with implementing a microcredit programme, coordinated by the grant recipient (TAGs 256, 256a-IICA, on the Development of Camelids, Phase I and II). While well linked to and supportive of the IFAD PL regional programme, it is generally acknowledged that grant funds should not be used for lending purposes, and that the AR&T grant recipient institutions are unlikely to have the capacity to effectively manage loan programmes.

3. Relevance to IFAD Regional Strategies

119. The ultimate test of relevance to regional strategies (as also acknowledged by the present Screening Criteria) is that the TAG has potential for linkage to IFAD loan projects. The evaluation found that fully 82% of the reviewed TAG proposals specifically refer to ongoing or pipeline IFAD investment projects, to

[63] Not necessarily those covered in IFAD projects; nor does relevance necessarily imply adoption and/or impact.
[64] This raises the issue of flexibility and quick IFAD approval of any changes.

which the TAG was relevant. Though most of these linkages were not achieved during or after TAG completion, the intention of linkage was mentioned in the design documents. Input to future loan projects was also usually expected, even where there were also parallel linkages to ongoing ones. These TAG projects were therefore viewed as addressing technology priorities, which dealt with regional agricultural constraints of one kind or another. The below table is based on analysis of regional strategies, for identifying perceived role of grants and the technology gaps/priorities of the region.

Table 21: Regional Division Priorities for Technology and Grant Use

Regional Division	Grant and Technology Role in Regional Strategy	Technology Focus
PA	Strategy highlights access to technology for raising agricultural and NR productivity, with loans and grants jointly involved.	Focus on agriculture and NRM technologies (esp. related to soil fertility and water conservation). Prioritized technology characteristics: technologies that provide alternatives to external inputs, build on indigenous knowledge and practice, consider existing systems and constraints (e.g. gender division of labour), are sustainable and environmentally friendly, have visible and rapid benefits, and can be disseminated through client-driven institutions.
PF	Strategy views grant-based instruments as "building blocks" upon which loans can be constructed. Emphasis on NGO/ECP piloting role rather than AR&T grants.	Passing reference to need for smallholder access to technologies. Creating a better knowledge, information and technology system is one of strategic thrusts proposed, but primary interest is in technology dissemination rather than technology development.
PI	Strategy highlights both the development and the dissemination of sustainable or regenerative agricultural technologies, specifically for the development of less favored areas.	Characteristics of technologies for development of "less favoured areas," include conservation technologies based on indigenous knowledge and (specifically for hills and mountain areas) low-cost, gravity-fed technologies for sprinkler and drip irrigation. Technology focus includes forestry, agro-forestry, land-degradation, medicinal plants, organic foods.
PL	Strategy continues the use of grants primarily for setting up strategic regional networks, to provide technical support to projects.	Technology dissemination, rather than development is emphasized, with attention to development of local markets for extension and technical services. Technology for women is given special priority.
PN-NENA	Strategy notes use of grant funding for support of loan programme inception and implementation, including for innovative approaches and pilot projects that governments are reluctant to fund. Specific reference to grant use for research, TA, capacity-building and impact assessment. Plan to have broader-based interaction with universities, policy institutes, government and NGOs in addition to continuing with research centres "with proven track record." An example given of good grant funding is poverty mapping for targeting purposes.	Technology seen as a major constraint affecting the poor. Clear and focused attention on technology for arid areas, including: drought resistant varieties, water-saving technologies, improved rangeland management techniques.

E. Achievements of Research Objectives: Technology for the Poor

1. Overview of Achievements and Constraints

a) Achievement of Stated Objectives

120. The objectives of the research TAGs reviewed have often been stated in terms of the development of relevant technology for the poor. The evaluation found that these TAGs performed less well in terms of achievement of stated technology objectives than they did on design or relevance. About 60% were found to have achieved *most or a good part* of their objectives, about one third achieved some of their objectives and 10% achieved little. The CGIAR implemented TAGs were much more likely to have a satisfactory or above performance than the non-CGIAR ones.[65] There were no clear regional trends. Although there appeared to be some IARCs, which were less effective than others, it is not advisable to place conclusions on the sample, which does not include all TAGs implemented by all IARCs. In some instances, there were major differences in performance between different TAGs implemented by the same grantee (e.g. between TAGs 120 and TAG 301 on household food security and nutritional aspects of IFAD poverty alleviation projects, implemented by IFPRI) and even between several phases of the same project (as in the case of TAG 40-ILCA).

b) Short-term versus Longer-term Strategies for Generating Outputs

121. From the beginning the AR&T Programme, has stressed achievement of outputs over the short to medium term. During implementation this has not been consistently the case. At the early stages of the programme, multi-phased grants were more common, with IFAD supporting several longer-term research programmes. The New PMD Guidelines and the AR&T TAG Screening Criteria also explicitly prioritize medium to short-term outputs. Currently IFAD staff seem to informally view the lead time for achievement of outputs as consisting of only three years – that is, the usual length of a single TAG, discouraging repeat phases.

122. But agricultural research, is a long-term process. Depending on the nature of problems, ten or even fifteen years is not considered excessive for generation of completed technology outputs to address a given constraint. This is especially the case in certain kinds of research situations, as where there is little previous research to build on. In addition, agriculture production systems of smallholders in less favoured environments, for example in rainfed areas of Asia, Africa and NENA regions, are by nature complex and difficult to address. Where NARS are particularly weak, as in parts of Africa and Latin America, more time is needed up-front for capacity building. Farmer participatory research and impact evaluation also takes extra time, but is essential for generating appropriate outputs. In most situations, this makes the search for technically, environmentally, socially and economically sustainable production technologies a medium to long term task.

123. But single research projects can support a slice of an established research programme, building on accumulated research knowledge and outputs from past research, to further expand knowledge and produce technologies. TAGs have, therefore, to carefully choose the entry point for IFAD support, making sure that it is towards the end of the research programme, preferably at the technology validation stage. However, research, which is restricted to this shorter-term focus, is also restricted in terms of innovativeness. Opening up an entirely new research programme on, say, a "neglected" crop will involve a longer-term commitment. The same applies to research that begins to tackle a new pest control issue or find solutions to difficult environmental problems. Therefore, there is a trade-off involved in the choice between a longer-term approach to producing relevant outputs and a shorter-term focus.

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[65] Again, differences in reporting quality may be a factor.

c) The Problem of Attributing Technology Outputs to a Single TAG

124. It is somewhat artificial to consider research outputs as uniquely linked to a single TAG. In many cases TAGs under different numbers[66] could be considered to be part of related research programmes and to have benefited from "technology spillins" or "technology spillovers". For example, if we consider, TAG 148 alone, it would appear not to have produced usable outputs even though it benefited from work of TAG 35-IRRI on Rice Based Cropping Systems Research. However, a review of TAG 263, which benefited from the work of previous TAGs as well as other programmes of IRRI, produced striking results with potential for large scale adoption in the short-term. Again, if we take TAGs 167 and 167a for ICLARM, the results are less than satisfactory in terms of developing appropriate solutions for the poor, and particularly the landless poor. However, TAG 350-ICLARM on fish and rice production in South and South East Asia built on the learning from these TAGs, and TAG 531-ICLARM is going even further in developing complimentary social solutions to the technical ones. Therefore, a more adequate approach to achievements would be to look at the outputs of interlinked "clusters" of TAGs, or, a longer-term programme of research of IARCs to which IFAD has contributed. In cases where such a programme is easily identifiable, as in the case of ICIPE and IITA's work on cassava, or IRRI's work on rice, such an approach to assessing achievement could be feasible but require much wider information on IARCs research programmes.

d) The Range of Outputs Achieved by the Research TAGs

125. While technology development is the main expected output of the TAGs, it is not in line with the programme's approach, the only one. In the sample TAGs reviewed, 70% of TAGs had primarily technology development objectives. The rest were more concerned with capacity building, knowledge development, partnerships, networking or methodological issues. The evaluation institutional survey asked IARCs to note the *output* of the TAGs they had implemented. Their responses covered a wide range, as in box 2.

Box 2: The TAG Programme Output: IARCs Perspective

Physical Technology and Farming System Outputs
- Identification of improved crop or livestock production practices.
- Development and sometimes, dissemination, of new and/or improved varieties.
- Identification and dissemination of pest management technologies.
- Improved methodologies or approaches for applied research (e.g. for ecosystem analysis, farmer participatory research, impact evaluation).
- New tools such as guidelines, maps, remote sensing technology, which could enhance future research or extension.

Knowledge and Capacity Outputs
- New or strengthened institutional partnerships (other IARCs, extension, NGOs, CBOs).
- New partnerships (to promote multi-disciplinary research).
- Improved capacity (usually referring to NARS, but sometimes to extension systems, farmers).
- New operational networks, or expansion of existing networks or sub-networks.

Direct Benefits at the User Level (in cases where dissemination and adoption had occurred)
- Income benefits to poorer farmers as a result of improved technology access or better practices.
- Enhanced household food security resulting from production increases in consumed items.

[66] TAG 148-IRRI; TAG 263-IRRI; TAG 36-IITA, TAG 136-IITA; TAG 412-IITA; TAG 182-ICARDA; TAG 264-ICARDA; TAG 306-ICARDA; TAG 362-ACSAD; TAG 37-ACSAD, TAG 149-ACSAD; TAG 362-ACSAD.

e) Findings on Completion of Technology Outputs

126. The general findings of the evaluation on achievement of technology outputs of individual TAGs were as follows:

- In practice *less than half of TAGs were found by the evaluation to have actually achieved technology outputs during a three-year TAG period.* Particularly under the earlier TAGs, such as TAG 1-ICARDA on Faba Beans in the Nile Valley, TAG 40-ILCA on Arid Zones Livestock Systems, TAG 72-IITA technology outputs have usually taken two or more grant phases.
- There *is a better correspondence between short to medium term technology output expectations and research methods in recent years*, because the research supported by IFAD tends to be more downstream. During period I (1979-1990) almost 75% of TAGs had a core focus of applied research, in the second more than half the TAGs focused on adaptive research and technology validation (see discussion in chapter 3).
- *About 20% of TAGs, all implemented in the 1990-2001 period, have actually gone beyond the generation of technology packages to attempting technology dissemination on a small scale.* This has been done through demonstration plots, dissemination of improved seeds and varieties to farmers, promotion through NGOs, CBOs, extension systems, media or other channels for promotion of new technology or new management practices. Most have achieved partial success, according to stated objectives.

Box 3: Illustration of Non-Achievement of Technology Outputs

TAG 40-ILRI: ***Livestock Production Systems in the Sahel,*** is one of the earlier TAGs. The three objectives of the TAG made technical sense, but farmer circumstances and traditional practices had not been adequately taken into account in design of the TAG.

Objectives #1– introduction of forest legumes. The focus was on agro-silvo pastoral systems involving alley farming with leguminous trees to provide protein rich diet to small ruminants. But it was found that farmer adoption and long-terms sustainability of the system failed. There was particularly poor participation among women, who were recognized as major owners of small ruminants.

Objective #2– strategic feed supplement for small ruminants. This objective assumed use of the leguminous trees from the previous objective, which did indeed provide superior growth rates to other crop residues such as green maize stover. But since the introduction of leguminous trees had not succeeded (objective #1 above), this second objective also became unimplementable.

Objective #3– sheep manure as organic fertilizer. In theory this addition of sheep manure would increase soil fertility, but the problem was that in practice animals in the area roamed free, so while technically appropriate, in situational terms it was not a feasible solution. This should have been taken into account at the design stage, but was not. Thus this third objective could also not be met.

f) Main Constraints to Completion of Technology Outputs

127. Six main factors were indicated in non-achievement of TAG technology objectives. Except for the last two, they applied more often to non-CGIAR implemented grants than to CGIAR ones.

- *Over ambitious objectives*, and too many participating countries. An example is TAG 307-WARDA on the Accelerated Diffusion of Rice Technology, which virtually tried to do everything in the space of three years, with negative effects on both quality and quantity of achievements. Occasionally upstream research has been inadequately assessed, resulting in expected solutions not being ready for validation (as under TAG 320-FAO - case of upstream pheronome research at the University of Florida).

- *Inadequate capacity.* The TAGs fall along a management continuum of bad to excellent. A few non-CGIAR grant recipients and many NARS appear to have also suffered from research capacity constraints (e.g. human resources, equipment, vehicles to get to the field). At times CGIARs have also no produced acceptable products, perhaps because of relegation to junior staff (e.g. TAG 301-IFPRI on Household Food Security and Nutritional Aspects of IFAD Poverty Alleviation Projects) or other management constraints (TAG 307-WARDA on the Accelerated Diffusion of Rice Technology, TAG 318-CIAT on Improved Cassava Genetic Material). Very few TAG proposals have discussed capacity for undertaking the research. It is now one of the new screening criteria[67]. The best example found of "superior correspondence to criteria" as defined in the PMD list, is TAG 411-CIP, which was approved a few years before the criteria were developed.
- *Shortage of time.* This was one of the more common constraints (e.g. TAGs 136-IITA on the Biological Control of Cassava Pests, 167-ICLARM, 167a-ICLARM, both on fish culture, TAG 320-FAO on the Control of the Tropical Bont Tick). A three-year time frame is often too short where research tackles new problems, needs to do up-front staff hiring, capacity building, or extensive assessments. Some researchers argue that they need at least three cropping seasons to validate technology. Again, in certain cases, the research needs more time because of the growth cycle, as in the case of agro-forestry. But, barring a few notable exceptions, start-up has usually been slow. In the worst cases bureaucratic infighting or delays in hiring staff, acquiring field offices and so on, has taken years (in certain countries, like Bangladesh, such delays are routine). The common result is incomplete technology outputs.
- *Funding shortfalls.* In several TAGs the expected co-financing by other donors did not materialize (e.g. TAGs 256a-IICA on the Development of South American Camelids, 362-ACSAD on Rainfed Agricultural Technology Development). Or, costs were underestimated or allocated in such a way that little remained for actual research. Certain IARCs seem to have repeat problems with this. In many of these instances, IFAD has provided a second phase TAG to help achieve objectives. Sometimes a small grant (USD 100 000) has been provided to make up the difference (as for TAG 320-FAO).[68]
- *Climatic factor.* Unavoidable climatic factors such as floods, hurricanes and droughts can obviously delay technology testing (as under TAG 136-IITA, 362-ACSAD). Where several different countries and regions are involved, some may not finish activities within the three-year period.
- *Difficulties in partnering with NGOs; CBOs* and establish linkage with the extension system. These difficulties are discussed in details in section F.

2. Farmers Participation in Generating Research Outputs

128. Farmer participation in the research process, as in the farming system research (FSR) approach,[69] helps to make sure that technology is appropriate to farmers' circumstances and preferences. On the dimension of grassroots participation, the review rated TAG design as follows: 18% of TAGs as highly satisfactory, 50% as satisfactory, 11% as moderately satisfactory and 21% as unsatisfactory or unknown. The review found a gap between design and implementation of such approaches, but all the instances of very good performance on this dimension were CGIAR recipients. Some TAGs has not lived up to stated FSR goals, drifting back into a commodity orientation, with nominal, if any, end-user involvement in the research process. A clear improvement trend over time was evident. Increasingly TAGs are actually involving farmers in field experimentation, giving them a more meaningful participatory role, and taking

[67] The third TAG screening criteria is: "The institution(s) identified have competence and comparative advantage in the activities proposed in the concept note."

[68] This should not be interpreted to mean that small grant additions to TAGs are always a "patch-up" for cost overruns. Several have been very strategically used. This is discussed later under recommendations.

[69] An FSR approach to research emphasizes all aspects of farm management, respects farmers' own goals, and is ideally undertaken through on-farm farmer-managed experiments.

results of farmer experimentation or decision-making into account in refinement of improved technology packages.

129. **On-farm trials.** Around 80% of sample TAGs had implemented at least some on-farm technology validation and demonstration works, often in parallel to on-station trials. While a judgment could not be made in all cases, it was found that about 30% of these included at least some farmer managed trials, with substantive farmer input to decisions. At one end of the range were on-farm trials such as those in TAG 362-ACSAD, where only the experimental controls were conducted on farmer fields, and trials were clearly researcher managed. At the other, we have newer TAGs such as 361-IPGRI and 411-CIP (see box), where men and women farmers were heavily involved and progressively take over management of research. TAG 148 and 263-IRRI (see box) are good examples where farmers were involved in participatory technology development in rainfed rice-based farming systems of Eastern India. The example shows that it is not sufficient to involve only the male members of communities in the decision making process as it can result in introduction of technologies that may be economically efficient but disrupt social balance. The small new TAG 543-ENDE, also illustrates a research model with equal partnership between farmer and scientist, each learning from the other. Most of the TAG research falls somewhere in between. The example set by this TAG should be followed closely during implementation and lessons learnt appropriately discussed and disseminated. Lack of adequate incentives for both farmers and researchers involved, was clearly a major constraint in conducting on-farm trials.

Box 4: An Illustration of Farmer-Managed Research: TAG 411 Integrated Management of Potato Late Blight (LB) Disease

The International Potato Centre, in Lima, Peru, is implementing a phased and learning-based approach to farmer managed field testing under ongoing global TAG 411. The Farmer Field School (FFS) methodology is adapted for the purpose. No incentives are given to farmers, or to the group facilitators who are all volunteers.

First cropping season: Farmers acquire general understanding of the crop cycle, of IPM practices, learn about causes of LB and about experimental methods, through discovery-based approaches in FFSs. During the first cropping season, they conduct a series of experiments in plastic boxes, and a set of field experiments aimed at understanding and testing component technologies for IMP-LB control, as well as developing understanding of research techniques. In the Andes in Peru, this learning actually extends into the second cropping season because farmers have difficulty grasping the experimental paradigm.

Second cropping season: The research agenda is placed in the hands of the FFSs. They are encouraged to integrate the concepts learned during Season I into a locally appropriate and acceptable IMP-LB strategy through the design and conduct of on-farm trials. They are also given support to extend their experimentation to other agricultural problems they confront. Again, in the case of Peru, the experimentation needs to continue for at least two cropping seasons and perhaps for three, as farmers gradually gain confidence. The process is continually monitored and impact on technology adoption is evaluated.

The FFS model has clear advantages for channeling farmer participation in research, and has been found to speed up the adoption process by several years. But costs of maintaining FFSs are high. The collaborating NGO in Peru estimates USD 2 500 per FFS per annum. Such costs can be better justified where the FFS assumes multiple functions, rather than focusing on a single crop, as is beginning to occur under this programme.

130. Where on-farm trials were conducted under TAG financed research, TAG reports found it had made one or more of the following contributions to the process:

- More realistic assessment of technology applicability and local adoption potential – 25%.
- Useful information on farmer technology preferences (e.g. on different varieties or solutions) – 20%.
- Dissemination of the technology (resulting from the horizontal demonstration effect of trials) – 20%.
- Understanding of which techniques and combinations of techniques work best for farmers, for developing improved technology packages – 15%.
- Information on promising indigenous technologies, which could be researched – 12%.
- Capacity building for farmers, through the research experience – 4%.

131. **Farmer Participation in Varietal Selection.** About 10% of the reviewed TAGs demonstrated involvement in farmers participation in varietal selection mostly of newer origin. The new ongoing TAG 457-IITA provides a good illustration: already in PY1 farmers in Benin, Ghana, Togo and elsewhere, were involved in evaluation of yam cultivars in terms of both tuber yield and culinary qualities. TAG 318-CIAT on cassava (see box) is another. *14% of TAGs had implemented participatory monitoring and evaluation of research*: TAGs began promoting such approaches at least as early as 1984, which is earlier than their appearance under IFAD loan projects. Good examples include TAGs 120-IFPRI, 167a-ICLARM, 192-CARDI.

Box 5: An Illustration of Participation in Varietal Selection. TAG 318 Programme for the Enhancement of Income-generation Potential through Development and Transfer of Improved Cassava and Post-Harvest Technologies.

The described farmer-participatory research took place in Brazil, with NGO collaboration. Farmers were actively involved in selecting cassava varieties for further development. In order that this work, the programme went to some trouble to establish a common language between farmers and researchers, and to understand what specific aspects farmers in different localities looked for in cassava. What they found was:

- Women and men looked for different features, primarily along processing versus production lines.
- The most important selection criteria applied by farmers were: root and foliage production, root dry matter content (by their evaluation means), plant architecture and planting material production.
- Farmers tended to base their preferences on their current varieties (that is, if the current cassava varieties had white roots, then they wanted white roots).
- Although they may have used different language, farmers and researchers looked for much the same types of features.

Such farmer selection was used to eliminate and prioritize varieties for further work. Farmers were also involved in field-testing on their own plots. CIAT noted that the involvement of farmers, particularly at the early stages of the selection process, increased efficiency. But clearly it takes time and money.

3. Examples of Technology Outputs of the Programme

a) Technology Outputs of Research on Crops and Cropping Systems

132. As documented in Section III, the Programme has been most active in crop and cropping systems research over the years. Some of the best known TAGs, which have achieved major impact and generated favourable publicity for IFAD, have dealt with related topics.

133. *Example #1: short- to medium-term crop research that has built on prior research knowledge and products in established crops.* In this case short-term technology outputs are generated on the basis of earlier research, which is normally best found in research on established crops, especially grains. Frequently such research builds on and uses new and improved varieties, to develop and refine location-

specific technological packages and associated management practices. The review sample included several TAGs that have taken advantage of available knowledge and improved varieties of rice, wheat, maize, grain legumes, to adapt them to a specific location and user type. This end-user oriented research helps to identify gaps between the on-station results and results on farmers' fields and to find solutions. TAG 263-IRRI (Collaborative Research and Development or Sustainable Farming Systems in South Asia*)*, utilized the past knowledge from research on rainfed rice supported by IRRI and the national programmes on genetic improvement and components of crop management practices, to develop ecosystem-specific rice and rice-based production technologies suited to needs of the poor smallholders in Eastern India. TAG 306-ICARDA/CIMMYT built on findings from earlier crop improvement work of CIMMYT and ICARDA to improve dryland durum wheat productivity for West Africa and Northern Africa, identifying more drought and disease tolerant varieties.

134. *Example #2: technology development on the basis of indigenous knowledge and technology.* Such a research strategy would usually result in small improvements in existing crop and livestock management practices (such as planting time, spacing arrangements, IPM). But such seemingly minor improvements can increase and stabilize food production at least risk. The technology outputs are more easily adoptable for poorer farmers, particularly for subsistence crops, on which farmers are often loath to spend money for fertilizer or pesticides[70]. Some examples of IFAD experience:

- Reviving and disseminating traditional practices as in sericulture, apiculture – TAG 308-ICIPE and for IPM of pulse pests under TAG 330-ICRISAT. The latter TAG has a particularly well documented case on effectiveness of manual shaking of pigeonpea, which is a simple indigenous cultural practice for dislodging pests.
- Building new solutions on the basis of traditional knowledge (for suitable intercropping with coconut – TAG 361-IPGRI).
- Development of physical technologies by local people on the basis of locally available products and production technologies (e.g. development of a neem insecticide by village women in TAG 330-ICRISAT).

Box 6: TAG 263-IRRI: Collaborative Research and Development of Sustainable Farming Systems in South Asia (Phase II) – Building on Existing Farmers Knowledge

This TAG built on area farmers' indigenous technical knowledge, with a small improvement, to generate appropriate and adoptable technology.
In parts of East India farmers practice direct seeding, raising the crop when the fields are still unflooded (upland) and converting these to flooded (lowland) after the rains. This indigenous method called *beasi* or *beushening* saves labour (about 70 person days compared to transplanting), avoids need for a separate nursery and, by giving the crop an early start, avoids terminal drought. Despite these advantages, however, crop yields suffer due to uneven crop establishment and weed competition. A simple modification developed under the TAG involved raising of a nursery in the same field which allows farmers to undertake gap filling and improve weed control measures.

135. *Example # 3: research on improved crop management techniques.* This type of research can be short-term and is usually associated with improved varieties. Ideally, its starting point is a thorough understanding of existing practices of smallholders, and the reasons for current practices, including multiple livelihood obligations. Where this has not occurred, the new management practices are usually not adopted

[70] This approach has similarities with the central philosophy of the now closed Special Program for Africa. A summary of this approach is provided in the OE evaluation of the SPA programme and a case study was also produced under the OE review of *IFAD's Capacity for Innovation*, Rome, 2001.

(as where earlier weeding is proposed, but farmers can not do it because the timing conflicts with seasonal off-farm employment).

136. Several TAGs have been concerned with optimal management practices such as fertilizer application, tillage (land preparation), seeding rate, weed control, sowing date, and harvesting techniques. TAG 181-ICRISAT developed technology for increasing the productivity of groundnut, pigeonpea and chickpea for semi-arid areas of India, using varieties and crop management practices that were earlier developed by ICRISAT through its core programme. TAG 362-ACSAD developed crop rotations incorporating wheat or barley with either a legume crop or legume forage or self-generating legume pasture, for the rainfed areas of Near East and North Africa. TAG 148-IRRI developed improved practices for optimum rainfed rice crop establishment and fertility management, including use of green manure crops, which would be affordable to resource-poor farmers.

137. *Example # 4: Longer-term crop and cropping systems research.* The approach to achieving shorter term outputs described above for established crops, while remaining a basic feature of the programme, and often associated with established crops, was not universally applied to *all* established crops.

> *4.1.* Outputs from long-term research on the faba bean, an established crop. IFAD supported long-term research on faba bean (TAG 1-ICARDA - Nile Valley Project) over three phases between 1979 to 1988 (nine individual yearly TAGs) for breeding of suitable varieties and crop management work to meet location specific needs of farmers in different countries. Faba bean was an important part of ICARDA's core programme. The main rationale for IFAD's long-term support appeared to be the importance of faba bean as a source of protein for poorer people in the participating countries. The first two phases of research developed new varieties and some component technologies, such as weed control, fertilizer application, pest management, with research conducted on-station. Later, some intensive inputs integrated production packages were also developed in farmers' fields, for instance in the Nile Delta in Egypt, to deal with the problem of chocolate spot disease of faba bean. A method of making faba bean "safe" in health terms was also developed to avoid favism, an acute form of haemolytic anemia. Phase III of the long-term research programme actually developed linkages with development projects to accelerate dissemination. While in many ways an excellent multi-disciplinary and participatory research programme, with many technology outputs, its main weakness from IFAD's perspective was that the technology outputs generated were too input-intensive. This precluded adoption by most of the poorer farmers, who could neither afford the inputs or had access to longer-term extension services for needed inputs, information and instruction.

> *4.2* Outputs from long-term research on rice, an established crop. Between 1979 to 2001 the AR&T Programme allocated USD 11.762 to IRRI and 4.23 million to WARDA for rainfed rice research. It addressed the major constraints to higher rice productivity in rainfed areas, i.e. drought, submergence and flash flooding, low resource base of farmers and unavailability of appropriate technologies. The research objectives progressed from varietal development (various phases of TAGs 3-WARDA on Rice Research and 35-IRRI on Rice Based Cropping Systems) to validation and delivery of new technologies to farming communities using participatory approaches (TAGs 263-IRRI, 424-IRRI, and 488-WARDA). This is a longer-term research programme, which still generated several usable short-term outputs along the way. The TAGs were implemented jointly by the institutions of the Indian Council for Agricultural Research (ICAR) and IRRI. They utilized a great deal of accumulated knowledge of the national and international partners, new information from TAGs on rice varieties, environments and ecosystems, had close involvement of farming communities in planning and implementation of the research programme. This enabled the TAG to identify, validate and refine selected indigenous technologies for seedling management, crop establishment and nutrient application. It has been estimated that the cumulative effect of these

technologies development led to an annual growth rate in rice production of more than 2% per annum over the past five years.[71]

138. *Example # 5: Outputs from research on "neglected" crops.* Many important food crops of the rural poor, especially in Africa, have received inadequate attention from international and national research systems to conserve and enhance their economic status through germplasm collection, improvement in productivity or the quality of traded products. Such lack of upstream research limits ability for downstream site specific technology validation and transfer. Until establishment of IITA in 1967, cassava, yam and plantain, which are basically crops of the poor, were "neglected" crops in research terms. IFAD took a lead in supporting work on these crops and mobilized additional donor support for research and development.

5.1. Outputs from long-term research on cassava. Cassava is a crucial crop in household food security in Africa, especially for the poor. IFAD has supported cassava research over the entire life span of the AR&T Programme (1979 to present), allocating a total of USD 12.7 million to various cassava research programmes. This research has covered a wide range, including some upstream germplasm development as well as downstream research, and finally cassava policy development. A range of technology products has been generated along the way. Between 1979 to 1984 six annual grants totaling USD 6.85 (TAG 2) were provided for the IITA's Root and Tuber Improvement Programme. Technology outputs were improved cassava varieties.

Starting in 1980, (TAGs 36 and 136 – USD 3.1 million) the Programme supported research on biological control of two cassava pests which were threatening the food source of a large population of cassava growers in Africa - the well-known Cassava Meal Bug (CMB), and Green Spider Mite (GSM). IFAD assumed a leadership role in addressing this threat and provided long-term support to research and development efforts both through its own grant and loan resources and by mobilizing additional funds from other donors. IITA was able to mobilize a team of dedicated scientists who developed a pro-poor, environmentally safe and sustainable approach to solving the pest problem. The research on CMB looked for natural enemies in Latin America, the "home region" for CMB. It developed a highly cost-effective control approach, which involved release of a parasitoid in cassava producing countries in Africa (see box under section on Impact). GSM proved to be more difficult, requiring additional support (TAG 412). The success of the cassava programme also helped to galvanize additional support for agricultural research in general and for this type of work in particular, both at the international and national levels.

Other grants for cassava research have been provided since, including for transfer of germplasm base from Latin America to areas in Africa with similar conditions (TAG 318-CIAT and IITA): *Programme for the Enhancement of Income-generation Potential through Development and Transfer of Improved Cassava and Post-harvest Technologies)* and for development of a global cassava policy.

5.2. Outputs from shorter-term research on plantain. Plantains are a major staple food crop in the high rainfall regions of tropical Africa. In many places they are consumed in larger quantities than cassava, yam and maize. However, in spite of potential to increase yields, research on this crop was neglected for many years. Between 1981 and 1986, the AR&T Programme provided six annual grants for applied and adaptive research totaling USD 1.61 million (TAG 72-IITA). The basic goal of this research was to develop an efficient smallholder production system for plantain and to strengthen plantain research capacity in the West African national research organizations. Due to the very limited prior knowledge, the research had to choose its focus from a large number of researchable production constraints upstream and downstream. The research produced new

[71] Singh, VP, and RK Singh, editors 2000. Rainfed Rice: A sourcebook of best practices and strategies in Eastern India., International Rice Research Institute, 292 pp.

varieties for multiplication and improved management practices of plantain but could not deal with everything within a six-year period. Topics like the economics of plantain production were therefore omitted. Specific achievements and outputs of the programme are summarized in Box 7.

Box 7: Technology Outputs from IFAD Supported Research on the "Neglected Crop" Plantain

IFAD-supported plantain research at IITA started with setting up of the West African Regional Co-operative for Research on Plantain (WARCORP), to undertake multi-disciplinary research. At its peak eleven scientists from nine institutions in six countries were active members of this cooperative. Later, linkages between WARCORP and the International Network for Improvement of Banana and Plaintain (INIBAP) were established, which helped in post-project continuation of the research started by IFAD. The research programme achievements included the following:

- Building of a collection of varieties from member countries at IITA's regional field station for identification and multiplication of more productive and disease tolerant materials (e.g. material with possible tolerance to black *sigatoka* disease).
- Development of a rapid multiplication tissue-culture technique using meritstem cells.
- Development of a number of improved cultural practices, such as use of mulching to arrest rapid yield decline in rattan crop, and identification of species that can be grown as inter-crops to provide mulching material.
- Transfer of disease free seedlings to farmers through the national programmes.

5.3. Outputs from research on bamboo and rattan (B&R) - other 'neglected' crops. B&R are two important non-timber forest products (NTFPs) with multiple uses, which have also received TAG support. But there has been less success in developing appropriate technology outputs. Many poor and disadvantaged groups, especially tribal populations living in and around forests, depend on such products for their livelihoods. TAG 257-CIFOR (International Network for Bamboo and Rattan, approved 1993) initially financed background work for setting up a database and identify technologies for using bamboo and rattan in small and medium enterprises in Asian countries. TAG 332-IDRC (Development and transfer of technologies to smallholder for bamboo and rattan, approved in 1996) worked on socio-economic and policy studies on post-harvest technologies and their transfer. Unfortunately, the work on post-harvest technologies largely focused on small to medium-scale industry, which is more likely to exist in urban areas than in the villages.

139. *Example #6: Outputs from Integrated Crop Pest Management Research.* Since the early nineties the AR&T programme has financed a number of TAGs for development of Integrated Pest Management (IPM) technologies. The few sample TAGs reviewed on IPM research, suggest a four to five year research period for generating outputs, if impact evaluation is included, although it can sometimes also be done in three years. Resolving production and legal issues can take longer. In general, these aspects need more up-front attention to ensure that the technology outputs of the research are useful. The IPM technologies developed under the TAGs involved host-plant resistance, cultural control practices that minimize or avoid pest build-up and the use of bio-pesticides (natural insecticides and entomopathogens) with a minimum use of selective synthetic pesticides. Often appropriate indigenous technologies have been identified, validated, improved and integrated into recommended packages, as in the case of TAG 330-ICRISAT (see below). Farmer participatory research, and sometimes farmer managed research, has been a key feature of all the IPM TAGs in the evaluation sample.

140. TAG 330-ICRISAT (Control of pulse pests in South Asia; approved 1996) developed IPM recommendations for containment of an important pest pod borer (Helicoverpa) of chickpea and pigeonpea in South Asia, mainly India. TAG 386-ICIPE (IPM of vegetable crops in East Africa: Kenya, Uganda, Tanzania and Ethiopia) helped to evolve locally sustainable models of Farmer Field Schools to promote

IPM technologies and to fine-tune options for control of major insects of vegetable crops. TAG 411-CIP (on-going global TAG on integrated management of potato late blight disease) is using a modified Farmers Field Schools (FFS) to screen and select potato varieties tolerant to late blight disease, reduce pesticide application and improve associated farming practices of farmers. Men and women farmers are empowered to gradually take over the management of the research and the search for solutions. Indigenous solutions, for instance, to crop storage, are also researched. In Peru, healthy potato yield has been considerably increased for farmers and pesticide use has been decreased an average of 20%, but sometimes as much as 50%, with considerable savings.

b) Technology Outputs from Research on Livestock, Commercial Insects, Fisheries

i) Outputs from Livestock Research

141. The AR&T Programme support for livestock research and technology transfer has focused on both small livestock (goats, sheep) and larger livestock (camelids, camels, cattle). More support has been provided for the former, in line with their greater importance to smallholders. Three of the important sub-areas that the Programme has supported are: (i) livestock feed; (ii) breed improvement and reproduction; (iii) pest control/disease management.

142. In general, TAGs supporting livestock production research do not appear to have been as successful in achieving stated objectives as in the case of crop research. The research seems to lack focus, with coverage of a number of different species, some with doubtful linkage with poverty objectives (e.g. TAG 216-ACSAD: Camel Applied Research Network Programme). Some worked on technologies not accepted by farmers (TAG 40-ILRI on Arid Zones Livestock Systems), others suffered from weak design and assumptions about the research on which they would build (e.g. TAGs 192-CARDI on Sheep Production in the Caribbean, 320-FAO on the tropical bont tick), while still others conducted virtually no research and became more involved in using grant funds for lending to microenterprises (e.g. TAGs 256, 256a on South American Camelids). **The single most important issue which appears to come up most often as a constraint in livestock research is poor understanding of the end-users, their livelihoods, resources, beliefs and practices.** This suggests poor performance and/or integration of socio-economic research.

Box 8: TAG 192-CARDI: Small Ruminant Research: Constraints Facing Livestock Research

This research got off to a bad start. It was found that the survey data that was assumed to have been collected on ruminant production systems in the seven participating Caribbean countries, did not in fact exist. This meant that: i) the research was delayed while farm surveys were done, and ii) that only superficial data was collected, which undermined subsequent research. Among key issues "missed" were: i) the traditional free range grazing practices of smallholders (sheep and goats grazed "free" on government lands), the role of ruminants in the farming system, and the role of women in livestock management. The subsequent research could not be viewed as farmer priority based. It also had difficulty getting on-farm ruminant management trials going (perhaps because farmers were simply not interested in intensive and semi-intensive management). In practice, the amount of technology testing was fairly limited and focused mainly on introduction of reject banana feeding and to a lesser extent on fodder trees and cocoa pod meal as feed. Field tests were poorly supervised and had numerous problems. Technology outputs were very partly completed and adoption was doubtful. Main constraints identified were: the lack of land tenure; the grazing of ruminants on public lands; the prevailing role of ruminants as a part-time activity; and lack of market incentives for further effort or investment. The higher-quality breeding stock used in trials (blackbelly sheep and anglo-nubian goats) cost roughly ten times what local animals cost, therefore discouraging adoption by the poor.

Box 9: TAGs 256, 256a-IICA: Regional Programme for the Development of South American Camelids: Innovative TAG?

These TAGs are unusual in the context of agricultural research review, as they dealt primarily with technology transfer and are more oriented towards camelid product processing and marketing than towards production improvements. The technology transfer activities were intended to strengthen exchange of technology among producers, artisans and small merchants across the four collaborating countries (Peru, Bolivia, Chile, Argentina). Horizontal information exchange (mainly through training and TA), specialized capitalization, and dissemination were involved. In practice, the activities became heavily focused on a Technology Promotion Fund, which provided loans for small businesses or industry, often urban, for processing and marketing of camelid products. These included tanneries, restaurants serving camelid meat and fibre-based handicrafts producers. The review of reports indicates very little, if any, research. Most of the technologies transferred or promoted were not new, but were "tried and tested." Examples are: refrigeration, technology for improved slaughtering, improved butcher stands, tannery technology. However, evaluation findings suggest that more adaptation should have been done. On the positive side, this TAG was closely linked to the preparation of two IFAD loan projects, in Bolivia and Peru, and to camelid development and marketing projects financed by other donors. Specific examples of technology support provided: i) for the Bolivia project – pasture management from Argentina and llama fibre classification from Peru; ii) for the Peruvian project – meat processing technology and marketing from Bolivia and Chile.

The questions here are: Should TAG money be used for lending activities? Do the IARCs have the expertise to manage these activities? Should these be done through IFAD loan projects, e.g. in collaboration with an experienced NGOs? Is IFAD pushing IARCs beyond their recognized comparative advantage and strength?

143. *Example # 1: Research on Livestock Feed.* Most livestock production systems of the poor rely on grazing in communal or public areas, which hardly provide the necessary nutrient requirements for livestock. These areas are also becoming increasingly degraded. This threat is made worse by rapidly increasing human and livestock population. Lack of adequate quality and quantity of feed is therefore a common constraint to livestock production, especially, but not exclusively, in NENA. However, up until recently, there has been very little research on addressing livestock feed constraints for smallholders. The AR&T Programme has made a considerable contribution to the topic. Much of this has taken place in the NENA region. As noted by a recent review of AR&T TAGs by PN, most of the livestock feed related research has focused on *alternative* feeding strategies and supplementary feeding. Three topics on which the research has focused are: (i) developing and disseminating new low-cost feed alternatives; (ii) improving the quality of crop residues, especially straw; and (iii) promotion of forages, especially legume forages, in the rotation.[72] **Much of this research has actually revived old technologies that were "gathering dust on the shelf," adapting them to try to the needs of smallholders.**

144. ICARDA TAGs 264 (on Sustainable Crop/Livestock Production Technologies) and 385 (on Integrated Crop/Livestock Production in Low Rainfall Areas) revived the feed block technology, which was rapidly adopted by livestock owners throughout most countries of the region. TAG 264 developed urea feed blocks enriched with vitamins for small ruminants. In some countries this technology has led to the development of a feed industry, relying on locally available and low-cost products and providing employment opportunities. Supplemental feed for ruminants in the Caribbean was developed by TAG 192-CARDI, using reject bananas and other farm by-products with added nutrients. TAG 40-ILCA conducted research in West Asia, North Africa and the Sahel on alley cropping with leguminous trees to provide a protein rich diet for small ruminants, but this system was not accepted by farmers, especially women who

[72] NENA/IFAD, *Assessing the Impact of IFAD TAG-Programme on Agricultural Research & Technology Transfer in the NENA Region -1980-1998) – Working Document, November 2001.*

were responsible for many of the tasks. **Indeed, the evaluation found that traditional free-range grazing practices relied on by the majority of the poor, which provide "free feed," have been a major constraint to adoption of the preceding types of research outputs, even when relatively low cost.**

145. *Example #2: Research on Breed Improvement and Reproduction.* Several of the livestock focused TAGs have included activities on breed improvement and reproduction related issues. For instance TAG 192-CARDI (Sheep production in the Caribbean) piloted the introduction of higher quality breeding stock (Blackbelly sheep and Anglo-Nubian goats). But this was financially unattractive to small farmers, since the costs per head were as much as ten times that of local animals. Moreover, for many ruminant owners, ruminants were also a part time/weekend activity with no commercial potential, so they were unwilling to invest in it. TAG 216-ACSAD, which focused on establishing another camel network and on sharing findings of existing research, appears to have undertaken a small study on colostrom feeding to camel calves to reduce mortality.[73] Research has also been supported in the NENA region on improving ewes' fertility and reproductive capacity through the introduction of improved rams and the use of hormone treatment. **Again, affordability for smallholders is not known.**[74]

146. *Example #3: Research on Animal Pest and Disease Management.* Two types of research supported for pest and disease management have been: (i) the development of control measures for a specific major pest or disease, and (ii) establishment of surveillance systems and networks for exchange of information. An example of the former is the adaptive research aimed at developing biological control measures for the tropical bont tick in the Caribbean (TAG 320-FAO: Control of Tropical Bont Tick from the Caribbean). This TAG is still ongoing. It addresses the role of the bont tick in heart-water disease and dermatophilosis amongst cattle, sheep and goats, which poses a major threat to the livelihoods of Caribbean livestock smallholders. **The research is not taking place under the best circumstances because of the ongoing aggressive donor-funded eradication programme using chemical pesticides. Albeit, a number of more environmentally appropriate technological options are being tested, such as self-medicating applicators.**

147. Another example is research on the parasitic disease, *trypanosomiasis*, transmitted by tsetse fly (TAGs 284 and 284a-ILRI: Assessment of trypanosomiasis control technologies, approved in 1994 and 1998 respectively). The first TAG reviewed lessons emerging from existing experience on the advantages and disadvantages of alternative technologies (vector suppression, use of trypanocidal drugs and screening for genetic resistance exhibited by some indigenous breeds of cattle and sheep) in Tsetse-affected areas in Southern and West Africa. The review demonstrated viability of an integrated approach for the control of tsetse and management of trypanosomiasis. Phase II, still continuing, refines integrated control strategies, taking into account policy, institutional, technical and socio-economic considerations.

148. Institutional strengthening to establish a regional animal disease surveillance and control network (RADISCON) in North Africa, the Middle East and the Arab Peninsula was supported by TAG 309-FAO, starting in 1995. The TAG helped to improve inter-regional flow of information and a start was made with a regional disease reporting arrangement and establishment of National Animal Disease Surveillance System.

149. *Example #4: Research on Crop/Livestock Integration.* Several TAGs have researched integration and synergies between crop and livestock systems, but often encountered constraints to adoption for a number of reasons, such as the free-range livestock grazing practices, time constraints, long-lead time to benefits, and other reasons. TAG 40-ILRI is a particularly vivid example. While technologically successful, people were not interested in growing leguminous trees for ruminant feed. The free range grazing practices

[73] Documents are not clear as to whether this was new research, or, existing research, but it appears to be the former. Either way, solutions or packages were not quite ready for dissemination.
[74] This illustration is from the earlier noted IFAD/PN Assessment of Impact.

also made constrained the use of sheep manure as organic fertilizer. In West Asia and North African countries (under TAG 264-ICARDA: Adaptive pastoral research in WANA region) similar types of problems were encountered with improving crop/livestock systems based on legume/cereal rotations.

ii) Outputs from Research on Commercial Insects

150. Commercial insect farming to produce silk and honey holds great promise for increasing rural incomes of the poor. It is particularly suitable for people who are land-poor, and can easily fit into the busy work schedule of rural families. Starting from 1995 IFAD has provided support to ICIPE's Commercial Insect Unit (TAGs 308 and 491). Much of this research has built on traditional knowledge and practice, to introduce improved sericulture and apiculture technologies for African farmers (in Kenya, Uganda, Tanzania, Madagascar, Zambia and Senegal). TAG 308-ICIPE (Development of Sericulture and Apiculture Technologies for Enhancing the Income Generating Potential of Smallholders and Conserving and Utilizing the Natural Resources of Africa) is notable in that it covered a remarkably wide range of research activities in a short three-year period, and actually achieved dissemination and promotion of technology-based micro-enterprises. An early output of the sericulture research was the breeding of an improved silkworm hybrid, suitable for African climate and solving the problems of optimal diet and diseases. Modern apiculture was developed, but based on traditional knowledge, and using improved but locally manufactured hives. Colony improvement was achieved through natural selection and queen breeding. Harvesting of honey, royal jelly, propolis and venom is being promoted and is being widely adopted by farmers. Even questions like packaging technology were addressed. The programme is now linking commercial insect farmers to markets and outlets to ensure economically viable enterprises. In 1999 a new TAG 458-ICIPE commenced a regional programme for the development of improved apiculture technologies (breeding of high performance races, disease management, and quality control laboratory/procedures for honey) in North Africa (Algeria, Libya, Morocco and Tunisia).

iii) Outputs from Research on Fisheries

151. The AR&T Programme has provided USD 1.637 million in support for inland fish farming (aquaculture), mainly in Bangladesh, where it can potentially provide the poor with much needed animal protein and micronutrients. IFAD entered this area of research in 1988[75] at a point where there was limited technical understanding of acquaculture. The cluster of grants to ICLARM that have supported the research (TAGs 167, 167a, 350, 531) demonstrate a clear learning curve in understanding poverty relevance of acquaculture technology and poverty impact, as well as on linking grants with IFAD loan projects.

152. Initial interest of the research was actually in assessing impact of fish culture extension programmes. This shifted to greater interest in technology issues as relevant to the poor, and to related social and policy dimensions. This body of research is very multidisciplinary in nature. The findings of the early TAGs (167, 167a) showed how difficult it was for the poorer households, and particularly the landless, to obtain secure access to water bodies, and therefore to benefit from acquaculture technologies even if disseminated to them by extension. But there were also positive lessons on what *does* constitute pro-poor technology in fish culture in Bangladesh – essentially, low-input[76] and disease-resistant fish species that could survive in small water bodies like ditches. The subsequent TAGs (350, 531), have clearly focused on developing technologies that could be suitable to the smaller types of waterbodies, and on developing strategies for associated community-based fisheries management in order to enhance access of poorer people to natural resources, fish culture technology and benefits. The ongoing TAG 531-ICLARM (Community based fisheries management programme in South and South East Asia; approved 2001) is testing innovative institutional co-management arrangements with communities in a range of diverse

[75] The date is actually difficult to pinpoint since this TAG suffered from numerous delays at all stages.
[76] The low-input refers more to purchased inputs such as inorganic fertilizer and less to organic fertilizers which was more available to and cheaper for the poor.

habitats. It is also one of the relatively few TAGs reviewed that has clear goals of influencing policies through advocacy and information exchange.

c) Outputs from Research on Natural Resource Management

i) Land and Water Management

153. Degradation of soil and water is a key factor in increasing poverty of farmers in many parts of the world, particularly in arid and semi-arid ecosystems. Growth in livestock and human populations is a factor. So are intensive production systems, which use inappropriate technologies and management practices. Several AR&T grants in the NENA region have addressed this region's critical water situation. On the one hand, they have supported development of crop technologies and management practices which could cope with water scarcity and on the other, conducted research on ways to conserve scarce water. One of the sample TAGs in the latter category is the two-year TAG 364- Development of a Regional Strategy for Utilization of Nubian Sandstone Aquifer System to CEDARE, approved in 1997. Its outputs included the development of an environmentally sound strategy for the sustainable utilization of this aquifer. Other TAGs (not in the sample) which have addressed the issue include TAG 331-ICARDA (Regional Programme for Strengthening Agricultural Research and Human Resource Development in the Arabian Peninsula; approved 1996). This research showed opportunities for saving water through better scheduling without adverse affects on the forage species under investigation. Work is now continuing under TAG 485-ICARDA (Sustainable Management of Natural Resources and Improvement of Major Production Systems of the Arabian Peninsula; approved 2000) to develop national strategies for more efficient use of water resources.[77]

154. Research has also focused on management of rangelands in West Africa and North Africa. Grants provided include (non-sample) TAG 264-ICARDA (Adaptive Pastoral Research in the WANA Region*)* which conducted research on improved management of pastures and rangelands to increase feed availability, and TAG 385-ICARDA (Development of Integrated Crop-Livestock Production Systems in West Asia and North Africa Region; approved 1997). Similar work took place under TAGs 331 and 485 (above) in different ecologies of the Arab Peninsula. These TAGs tested different methods of rehabilitating rangelands. They showed the value of including native forage shrubs that have drought, heat and salinity tolerance, with soil conservation measures in rehabilitation. IFAD learning in both such grant projects and also under some loans[78] has shown that rehabilitation of degraded rangelands is a long-term process that calls for an integrated approach. Improving pasture quantity and quality while incorporating social dimensions (avoidance of overgrazing) and policy actions.

ii) Agro-forestry

155. TAG experience has underlined the long-lead time in developing dissemination-ready technologies in agro-forestry - at least five years, and probably more. There is a parallel long lead-time to returns from agro-forestry technology adoption for farmers, which tends to limit interest among the very poor. Therefore, lack of demand for agro-forestry technology is a major issue, which the research needs to take into account. Review sample TAG 183-ICRAF and TAGs 183a both Agroforestry Research in West Africa can not be considered successful. Both on-station and on-farm experimentation were conducted but failed to generate completed technologies. The research appears to have paid too little attention to understanding

[77] The information on the non-sample TAGs in this sub-section has drawn from the above referred to PN paper on Impact Assessment of TAGs. The number of TAGs on NRM in the sample was insufficient, in part because of problems encountered in locating documents. But the importance of the issue warrants a more comprehensive discussion.

[78] For instance, under the Republic of EGYPT: Matrouh Resource Management Project, Phase I. ICARDA has been a major research partner in this loan project.

what farmers wanted (usually indigenous species) and to their traditional practices (of direct seeding). Also ignored at the beginning, was the need to make technology adoption more attractive (for instance, through having fruit-bearing live fences). Adoption constraints noted were cost, lack of water during the dry season, traditional beliefs and practices (which operated against planting of trees and shrubs), need for marketable non-timber products and lack of land tenure. A small ongoing TAG 543-ENDA/GRAF, has taken an entirely different and farmer-managed approach to such research. A new TAG 534-ICRAF (Programme for developing mechanisms to reward the upland poor of Asia for the environmental services they provide; approved 2001) also promises to be more successful in developing agro-forestry technology for poor upland communities in Asia.[79]

Box 10: TAG 183, 183a-ICRAF: Technology Outputs from Agro-forestry Research

This agroforestry research recognized up-front two important issues: i) that more than one phase would be needed to complete research outputs; ii) that low demand and resulting low adoption by farmers were risky because of the time it takes to generate results. Both these assumptions turned out to be true. A major weakness of this research is that it was top-down, technology driven and forester-scientist dominated. Farmers were largely forgotten. IFAD did constantly push for a socio-economist to be hired, but this was not done until four years after start-up. Therefore, socio-economic studies were done far too late and the research did not consider end-user constraints, practices and preferences in generating technology outputs.

Research trials eventually moved to farmers' fields, but most came to an unpleasant end: windbreak trials were either chopped down or stolen, some other field experiments were eaten by livestock or used for fuel, and in others, trees and shrubs died for lack of watering. The live hedge experiments probably came closest to generating technology outputs, but they had ignored what farmers wanted. Demand could also have been improved, if more attention had been paid to selecting species which provided protection against snakes, or grew edible fruit or other products for commercialization, that would offset some of the costs. Indigenous species, which farmers preferred, and could be direct-seeded, were also more drought tolerant. Constraints encountered during field trials, which also affected technology adoption were: cost, the long lead time involved, traditional beliefs which operated against planting of trees and shrubs, watering problems during the dry season and lack of land tenure, resulting in destruction and theft.

4. Conclusions on Generation of Technology Outputs

156. **Expectations versus Achievement**. The Programme appears to have been most successful in generating technology outputs from crop and cropping systems research, and comparatively less so in livestock and NRM research. As in the case of loan projects and other IFAD grant lines, the actual performance of AR&T TAGs has not matched expectations as noted in the design documents. A major factor has been the mismatch between the challenges and objectives of the research and the capacity to carry out that research effectively. One factor in less than satisfactory performance may be the desire for grantee institutions to conduct the research *they* want, as well as what IFAD wants, resulting in a shift, or a dual focus during implementation. IFAD's focus on short to medium term outputs of research is a factor in the achievement and quality of outputs. This focus can work in the case of "established" crops and production systems which can build on past research and already on-going programmes to identify a critical entry point for downstream research. But even in such cases, the three-year time period of most grants has been found to be too short to do a good job of both capacity building, the research and impact evaluation.

157. **Short-term versus longer-term strategies**. IFAD's focus on short to medium term outputs of research is a factor in achievement and quality of outputs. This focus can work in the case of "established"

[79] Since then there has been a considerable improvement both in the capacity of ICRAF, its linkages with the regional/national organizations and design of the agro-forestry TAGs. This Centre seems to be getting better at integrating bio-physical research and socio-economic needs of communities and working with NGOS.

crops and production systems which can build on past research or link onto already on-going programmes, to identify a critical entry point for downstream research. But even in such cases, the three-year time period of most grants has been found to be too short to do a good job of both capacity building, the research and impact evaluation. Global TAGs have a particularly difficult time. In the case of crops that have been previously "neglected" by researchers, the development of usable technologies requires several grant phases covering all stages from strategic/applied research to technology validation and dissemination. The same applies to cutting-edge research on major crop or animal pests and diseases and to most research on natural resource management. The longer life cycles of the species and complexities of the researchable issues would argue that the turnaround time for research outputs in animal agriculture is generally longer than with crops. In addition, the types of animal health issues encountered by poor farmers, e.g. neonatal mortality, reproductive disorders, nutrient/micronutrient deficiencies, have to be researched where they occur. As a result, it is more difficult to target research on shorter-term outputs. Support of a longer-term research programme "informally", through a "piecemeal" approach can be inefficient.

158. **Thematic focus of research and outputs**. As noted in earlier Chapter III, the Programme has placed more stress on crop research in the past than on livestock or NRM research. Generally speaking, crop and cropping systems TAGs also appear to have been more successful in generating completed technology outputs. But, except in the case of "neglected crops," IFAD may want to reassess this balance in the future, in light of both the urgency of environmental issues in many parts of the world, and the expected doubling in demand for livestock products in developing countries over the next 20 years. The latter offers new opportunities to transform subsistence agriculture into sustainable and market oriented enterprises in which animal agriculture technologies, especially for animal health, improved feed and feed use, genetic enhancement and better post-harvest handling, could play an important role.

159. Therefore, livestock research, and also research on commercial insects (including edible insects with commercial potential), could be much stronger and more strategic part of the Programme. The research could have a greater focus on problems and species of areas where poor are concentrated South Asia (SA) and Sub-Saharan Africa (SSA) and the associated production systems that involve livestock, e.g. rainfed mixed-farming in arid and semi-arid regions involving cattle, sheep and goats; rainfed humid and sub-humid tropics and subtropics involving buffalo, cattle, sheep and goats. Gender issues also need to be more effectively addressed in such research than they have been in the past.

160. The AR&T Programme could also strengthen its focus on NRM research, as it is doing in NENA, with attention to integrated approaches that include the social and policy dimensions. Sustainability and environmental protection in intensive mixed crop/livestock farming systems is also critical to livelihoods of 40 to 50% of smallholders in large parts of SA and SSA. IFAD loan projects in Latin America are also dealing with such issues and in need of appropriate technology and methodology, which they could upscale. Experiences of many TAGs looking at sustainability issues has shown that development of improved technologies and management systems needs to be supported by understanding of end-users and their livelihoods and by a supportive institutional, policy and legislative framework.

F. Research Partnerships during Implementation

1. Partnership Patterns in TAGs

161. The survey found that CGIAR and non-CGIAR grant recipient institutions noted differences in partnership patterns for TAG implementation, as in Table 22. These were also evident in the review of reports, though to a lesser extent. CGIAR institutions seem to be more at ease in working with NARES possibly because of past experience in this field and established modality of cooperation. NARES on the other hand may be more willing to cooperate with CGIARs in expectation of larger and sustained support. Nevertheless a host of partnership problems still exists between CGIARs and NARES.

Table 22: Comparison of CGIAR and Non-CGIAR Institutional Partnerships

Institutional Partners Mentioned	CGIARs	non-CGIARs
National (developing country) agricultural research orgs. (NARS)	100%	56%
Agricultural research orgs. From a developed country	57%	22%
Public sector extension organizations	86%	22%
NGOs	71%	33%
A donor funded development project	79%	55%
Another international research centre	57%	66%

162. Additional partners mentioned were universities[80], farmers' cooperatives and CBOs, local municipalities and the private sector. As shown by the above table, the greatest differences between CGIARs and non-CGIAR were in their partnership with NGOs and extension systems, and to a lesser extent, with agricultural research organizations from a developed country. The extent of partnership with NGOs and extension systems by CGIARs is greater than in the reports (partners are clearly listed), which might be explained by the fact that they were added at a later stage, or, were not considered as important as other partners. There were differences in opinion between respondents on the value of partnership with developed country research institutions. Some saw them as highly positive because of the low cost or no cost factor, and their potential for technical contribution.

2. Partnerships with NARS

Box 11: Differences in NARS Capacity to Partner in Research

There tend to be considerable differences in NARS capacity between regions and countries. Two examples illustrate.

TAG 263-IRRI. Under this TAG Indian NARS (ICAR and SAU scientists) played a lead role in conceptualizing as well as implementing the work programme. The national scientists either coordinated or were the lead members of the networks operating in Eastern India. In addition, the Indian NARS was able to catalyze convergence between the TAG and the Government of India financed development/scientific programmes. This augmented the limited resources available under the TAG. These developments significantly enhanced the chances of success and potential impact of the TAG programme.

TAG 307-WARDA was hampered by partnering with NARS (in Senegal and Gambia) who are on the other end of capacity spectrum. Because there was no confidence in the NARS being able to be useful partners in a TAG relying on participatory approaches, implementation was entrusted to NGOs and farmer cooperatives. In some situations this approach failed due to lack of a competent NGO and exclusion of the public institutions.

163. NARS are undeniably the key partners of IARCs in TAG research, though they were less with non-CGIARs. But this is often an uneasy partnership between unequals. Both the institutional survey and the TAG reports reveal partnership problems with NARS. The difficulty most frequently mentioned in the survey was the inadequate research funding of NARS. This results in them having little co-financing available for implementing project activities. NARS human resource constraints were also commonly mentioned: good scientists were few, and over committed. IARCs also referred to NARS communications weaknesses, inadequate reporting and accounting performance, poor facilities, lack of long-term plans, and limited social science expertise. Reference was also made to lack of cooperation between NARS themselves and the fact that NARS have been found to not always keep to Agreements made. In the Latin

[80] Universities should probably have been listed as a separate category in the survey questionnaire, as the review of reports shows them to be a common partner in research.

American region, NARS structural change and instability was mentioned, which reduced the possibility of long-term collaboration.

3. Partnership with Extension Systems

164. TAGs reports show that collaboration with extension systems has run into problems similar to those of NARS. They are underfinanced, with increasing problems of staff numbers, incentives and mobility. Many IARCs believe that because extension may still have more permanence than NGOs, research-extension collaboration is essential, in spite of the difficulties often involved. Quoting one CGIAR (CIP): "there are few countries with an efficient public-sector extension system. In most cases such systems have [also] undergone changes and reductions in recent years. However, despite their limitations, these services are still a more permanent [referring to NGOs] way of providing information to farmers, and, in some countries, such as China, are still an efficient way to disseminate agriculture-related information. In addition, public extension systems are starting to be revitalized in some countries, which provides opportunities for research institutions to provide technological and methodological inputs [for developing capacity].

165. The nature and extent of partnership with extension has varied considerably between TAGs. In some, extension system representatives have been members of the project governance system (e.g. TAGs 216-ACSAD, 411-CIP - see below), have been included in project training activities, and have collaborated in research, particularly farmer participatory field testing. But for the majority large scope still exists for improvement in partnership with extension systems.

4. Partnerships with NGOs and CBOs

166. **Frequency**. Contrary to the findings of the survey, the review of TAG reports did not show partnerships with NGOs[81] or CBOs to be a strong feature of the programme, with some notable exceptions. Only 29% of TAGs reviewed were found to include such partnerships, and 12% had limited NGO/CBO involvement. However, this difference with survey responses could result from inadequate coverage of the issue in the reports, which were mainly technical in nature and also due to the more recent vintage of IARC partnership with NGOs and CBOs.[82] What is clear is that in a number of TAGs (16% of the sample) IARC-NGO partnerships had been expected, but did not materialize, in spite of IFAD's active encouragement. Lack of good NGO or CBO availability was a common reason given for not collaborating with NGOs. Another seems to be the lack of expertise in identifying and dealing with NGOs and CBOs in both IARCs and NARES. One promising approach to partnering with a number of small NGOs is for one lead NGO to coordinate others. Under TAG 330-ICRISAT (Control of pulse pests in South Asia) the lead NGO trained and coordinated 12 NGOs at 24 locations.

167. **NGOs**. There is clear indication that NGO and CBO involvement is increasing. All instances of significant partnerships with NGOs have occurred in the second half of the programme, with NGOs more often involved in technology dissemination than in research activities. But again, there are exceptions. When involved in agricultural research, the NGOs' role has been to facilitate farmer involvement. Under TAG 318-CIAT, (Development and Transfer of Improved Cassava Genetic Material) NGOs trained farm households (including children) and played a key role in the on-farm testing of cassava in Brazil. Under TAG 181-ICRISAT (On farm research on groundnut, pigeonpea, chickpea and transfer of technology to SAT farmers of India), voluntary organizations were involved in on-farm validation and demonstration work of groundnut, chickpea and pidgeonpea. Under TAG 308-ICIPE (Development of Apiculture and Sericulture Technologies), NGOs were trained and actively involved in on-farm trials and participatory

[81] The definition of NGO that is used here excludes private universities, which have also been extensively involved in the TAGs.

[82] There is a need for ensuring that progress reports cover non-technical as well as technical aspects.

testing of apiculture and sericulture technologies. NGO involvement in technology dissemination is illustrated by such TAGs as IICA-256, (horizontal transfer of camelid-related technology), TAG 307-WARDA (for diffusion of rice technology) and TAG 330-ICRISAT for dissemination of technology for management of pulse pests (as well as in research).

168. **CBOs** have not been involved often enough. They have been more likely to be involved when TAGs were concerned with understanding local varieties or indigenous technology (as under TAGs 308-ICIPE, 181-ICRISAT, 330-ICRISAT) or, had activities of dissemination and market linkages. Under TAG 361-IPGRI, coconut producer organizations and farmers' village cooperatives were involved in coconut research and pilot production and marketing of new coconut-based products. Under TAG 181-ICRISAT, farmers' organizations were involved in on-farm validation of technology and in groundnut marketing. TAG 216-ACSAD included camel herder association representatives in the Steering Committee and in workshops.

169. Field visits have shown, however, that a good part of the TAG coordinators strongly believe that all research initiatives should include both NGO and extension systems as partners. Overall, NGOs came in for considerable praise in the surveys - particularly the larger international NGOs – both because of their healthy fiscal situation and their effective role in disseminating research findings. Quoting one CGIAR, referring to NGOs: "*This type of organization has replaced public services in many countries. They have resources for more efficient work and are continuously innovating in their methodologies. Our work with NGOs has been very productive because we have found a way to link NGOs with national research organizations and use the comparative advantages of both institutions. For example, many NGOs look at the food chain as a whole and not only at technical problems. In this way, needs identification, priority setting and technology evaluation and dissemination can be inserted in development programmes with a better chance of reducing poverty.*" Probably some of this positive attitude toward NGOs is donor induced, but also has strong adherents, as indicated by the quotation.

5. Governance Systems for Institutional Partnerships

170. Both the survey and the report reviews show that the very large majority of TAGs are using both Steering Committees (SC) and Workshops as governance mechanisms at the regional or global level.

Table 23: Comparison of CGIAR and Non-CGIAR Governance System

Governance System for Partnerships	CGIAR	Non-CGIAR
Steering Committee	93%	56%
Frequent Consultation	93%	67%
Occasional Consultation	50%	12%
Workshop	93%	89%

171. **Steering Committees**. As indicated by the above table, CGIARs appear to have almost unanimous belief in the value of a SC for purposes of review, planning coordination, monitoring, ensuring transparency and developing a sense of ownership of the activity. Over half of non-CGIARs also commonly set up SCs. Several IARCs stressed that the composition of the SC is important as it can become a mechanism for exclusion, or, simply inactive and of little value. Typically, a TAG Steering Committee would include representatives of all partners, the project coordinator, and donor representatives. Some TAG projects SCs have included NGOs, extension system representatives, and farmer or herder representatives, although the latter is unusual (TAG 216-ACSAD, 411-CIP are good examples). IFAD has been represented on several TAG SCs. The main problem associated with the SCs is cost. Most TAG SCs meet on an annual basis, but semi-annual is seen as preferable, if it were financially feasible. Several of the sample TAGs had additionally established Technical or Expert Advisory Committees or similar (as under TAG 136 –IITA on the Biological Control of Cassava Pests, TAGs 256/a-IICA on the development of South American Camelids, TAG 257-IDRC International Network for Bamboo and Rattan, TAG 263-IRRI

on the Development of Sustainable Rice Farming Systems in Southern Asia, and TAG 364-CEDARE on the Development of a Regional Strategy for the Utilization of the Nubian Sandstone Aquifer System).

172. **Workshops** are an even more popular governance mechanism. They are seen as encouraging peer review, knowledge update, and enhancing technical and personal relationships between partners, which ultimately benefits the ongoing programme. Start-up workshops can become a positive mechanism for fine-tuning of the project plan, as well as for co-ordination purposes. As with SCs, cost is the main problem with workshops.

173. **Global TAGs.** The review of projects shows that in spite of good governance systems established, coordination of multi-country and especially, of multi-regional projects with many partners, is a challenge. The coordinators of TAGs have not always been full-time, even in the case of highly complex projects, but there is insufficient information to estimate frequencies. On occasion, the project coordinator has been hired in consultation with IFAD. In other instances, staff scientists have been seconded. The evaluation and progress reports reveal poor management capabilities in a number of instances, and encouragingly effective management in others.

Box 12: Lessons Learned on Partnerships

Among the lessons on partnerships that have emerged from the institutional survey and review of grants documents are:

⇒ Key partners should be involved right from the start, at the planning or inception stage of the research. This results in much better working relationships later on. Early involvement is not only desirable with NARS, but also with extension organizations, NGOs and in any partnerships with development projects (see below discussion on linkages to IFAD loans).

⇒ The partnership under the TAG is more likely to be effective if the IARC and NARS, or IARC and other partners have an already established relationship. Otherwise the time and effort needed to establish and maintain a new partnership will cause delays, which are particularly critical in short duration research projects such as IFAD TAGs.

⇒ Partners need to be selected according to the skills and disciplines required to execute a project, with competent staff shared between partners.

⇒ A coordinating mechanism, such as a Steering Committee or workshop, minimally with annual meetings of all partners is essential, to sort out problems and make needed improvements.

⇒ Where certain partners (such as some country NARS) are much weaker than others, they will need extra help and attention, or there is a risk of endangering the entire partnership.

⇒ Where relevant, the issue of research product (technology output) ownership should be addressed at the start, to avoid conflict at the end.

174. One of the most complex TAGs reviewed in organizational terms is TAG 411-CIP, which operates in four regions, six countries and partners with 22 institutions. Coordination is further complicated by the fact that partners include NGOs, interested in dissemination, on an equal footing with NARS, whose priorities are research. The regional offices of CIP are playing an essential part in successful coordination. This type of project would be impossible without strong regional support. The special coordination problems, and additional coordination costs of global TAGs need to be acknowledged in allowing for TAG overheads.

175. At the country level the coordinating arrangements are often not spelled out in proposals and reports, but among those that have been mentioned are National Task Forces, Steering Committees, and Advisory Committees. These arrangements have served to perform such functions as coordination among participating national researchers and organizations, identification of national level research priorities,

organization of work groups or teams, selection among competing national proposals (where competitive small grant lines have been established), and supervision of activities.

G. Grant Linkages to IFAD Loan Projects

1. Linkage Expectations

176. **Definition of linkages.** One of the ultimate and consistent objectives of the AR&T Programme throughout its development is that it should contribute to the IFAD loan portfolio. That is, that AR&T TAGs and loan projects would form "linkages." The programme rationale throughout refers to the IFAD loan project becoming a platform for dissemination of the technology or methodology developed by the TAG. IARC respondents to the survey understood the linkages concept in a broader sense, to include several up-front activities. For instance, they include cases where there were joint research activities, as where the TAG conducts on-farm technology testing with loan project area farmers (e.g. TAG 318-CIAT on the Development and Transfer of Improved Cassava Genetic Material). In such cases it "may be" a subsequent loan which becomes a platform for dissemination of the technology, but "linkages" already occur under an earlier one. They also included IARC staff input into design or evaluation of an IFAD loan, or even participation in annual reviews of a loan project as "linkages." Nor can the case where a TAG's main goal is to evaluate technology impact on IFAD loan projects (e.g. TAG 120-IFPRI on the Nutritional Effects of Cash Cropping) be excluded from the definition.

177. Fully 78% of EB proposals had named specific IFAD loan projects which "would benefit" (or similar wording) from technology output of the TAG. There was no evidence of a trend. Where no expectations of linkages were noted, it was usually because they would be impossible with the type of TAG under consideration, such as strategic research involved in the eradication of the cassava mealybug and the green spider mite – TAG 36-IITA, or development of a regional strategy as under TAG 364-CEDARE on the Development of a Regional Strategy for the Utilization of the Nubian Sandstone Aquifer System. Forward, parallel and backward types of linkage expectations were also found (see below).[83] However, although frequently present in the EB version of the TAG proposal, *very rarely are linkages to IFAD loans mentioned in the original IARC proposal.*

178. Detail on the exact nature of the expected links varied. Most proposals simply mentioned specific IFAD projects. In at least three cases some of the projects mentioned were in different countries than those in which the TAG had planned activities, or, the project was already closed at the time of the proposed parallel linkages. This would imply a certain "decorative" nature to some of the linkage expectations. However, in a few cases actual Memoranda of Agreement were attached (as under TAGs 1, 183a-ICRAF on Agroforestry Research, 308-ICIPE on the Development of Sericulture and Apiculture Technologies for Enhancing the Income Generation Potential of Smallholders in Africa) or, more specific detail was provided either on the project or the nature of expected links (as in the EB PRR for 362-ACSAD, where an entire attachment focused on the issue, perhaps because earlier failures with the IARC had shown the need for more forceful guidance)[84] or under TAG 332-IDRC/INBAR, where the text of the EB PRR spells out specifically what would occur.[85]

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[83] Forward linkage refers to technology input from the TAG, or involving TAG implementation staff, to a new or pipeline project. Parallel linkages refer to support for an ongoing project. Backward linkages are defined as those TAGs which evaluate a completed loan project, or, where the loan has provided input to, or developed the TAG.

[84] It was expected that the TAG would validate the technologies in or near the ongoing project areas, fine-tune, assess adoption constraints and strategies and generally provide all the information needed by the IFAD loan project. Wider dissemination of the loan package would then occur under the loans. The TAG reports provide no information on achievements.

[85] Quoting para. 13, "INBAR would carry out studies in nine potential and ongoing IFAD project locations in Asia, six in Africa and – initially – on in Latin America, the exact locations to be determined in consultation with the Fund's regional divisions. The methodology and approaches developed and refined in Phase I would be used to provide inputs

2. Linkage Achievements

179. Evidence of *actual* achievement of linkages was much lower. Among the 78% of reviewed TAGs that had anticipated such linkages, only 46% had evidence of any form of linkage achievement, even when considerable latitude of definition is allowed.[86] Therefore, overall, the review of reports suggested that only 36% of TAGs could be considered successful in achieving linkages (this is again different from whether these linkages resulted in positive impact on the poor). Survey responses indicated a higher linkage rate – 59% overall, with non-CGIARs actually reporting better success on this indicator than did CGIARs (67% compared to 54%). The review of reports indicated a contrary pattern. Omission in reporting, particularly by non-CGIARs, could explain the difference between evidence in documents and survey responses. No regional patterns were evident. Where multiple phases were involved, linkages were very rarely achieved during the first phase, even in cases where usable outputs were generated. The main types of linkages found were as below.

Box 13: Types of TAG/Loan Project Linkages Observed*

Forward linkages (50%):

⇒ TAG grant recipient (IARC) staff participate in IFAD formulation or appraisal missions to lend related expertise (as under TAG 308-ICIPE, for Libya, Uganda projects, TAG 332-IDRC/INBAR for projects in Zambia, India and Philippines).

⇒ Dissemination of TAG developed technologies or approaches under loans (as under TAGs 136-IITA on the Biological Control of Cassava Pests and 256-IICA on South American Camelids).

Parallel linkages (38%):

⇒ TAG implementation overlap with an ongoing project, with TAG data collection inside project areas, and with project targeted farmers conducting any on-farm testing activities of the TAG (as in cassava research under TAG 318-CIAT, in Brazil and pidgeon pea protection from pests under TAG 330-ICRISAT, in Andhra Pradesh, India).

⇒ TAG staff participate in capacity building activities of the project, as in training of extensionists and field technicians (as under TAG 318-CIAT, in Brazil).

⇒ Loan dissemination of TAG developed technologies, with TAG supervision of the activity (this usually requires that the TAG itself focuses on piloting of dissemination, as under TAG 318-CIAT).

⇒ General information/learning exchanges between the TAG and loan projects, with no tangible results (This is a marginal type of link that is mentioned in several progress reports).

Backward linkages (12%):

⇒ TAG evaluation of impact of an IFAD financed loan project (as under TAGs 120-IFPRI, which assessed the impact of a shift to cash cropping).

⇒ TAG origination under a loan project, as in instances where a need for technology development has been identified, or where the loan has simply influenced the TAG design in more general ways (e.g. TAG 307-WARDA). There may or may not be a forward link intent.

* On only 36% of the cases where these linkages occurred.

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for developing farm and enterprise models in an investment-project context." The reports reviewed provided no information on whether this occurred or not.

[86] Unfortunately, progress, completion and even evaluation and supervision reports, often fail to discuss the linkage aspect, even when it has been heavily stressed by rationale of proposals. This needs attention.

Box 14: Illustrations of Linkage Difficulties

TAG 183-ICRAF, an agro-forestry research project, was intended to establish operational linkages in the four participating countries, but achieved them in only one (not known how well). In Mali, the intended links did not occur because the wrong project had been selected (a different agro-ecological zone) whereas another IFAD project would have been appropriate. In Burkina Faso, there were possibilities, but bureaucratic factors interfered. In Niger, the fact that there was incomplete geographic overlap was a hindrance.

TAG167-ICLARM, evaluated aquaculture extension only in Bangladesh, and was intended to link with the IFAD Oxbow Lakes project. But the TAG located in a different area of the country from the intended project, in an area where physical access was difficult. It also dealt with non-comparable waterbodies from those included under the loan project, resulting in major differences in both technical and social aspects. The timing also was off, because of the two-year delay in the TAG start-up, with results not available when the loan project started. The aquaculture extension responsibilities under the loan also shifted to an agency that was not involved in the TAG (an NGO), which used an entirely different extension approach from those being evaluated by the TAG. Finally, the TAG was operating under budgetary constraints, which did not permit extensive travel and direct contact with the loan project.

180. The review found unexploited *potential* for forming such linkages in more instances. Promising opportunities had often been missed such as: involvement of project staff in start-up meetings of workshops of the TAG, as ex-officio members of their respective national Task Forces, participation of project staff in regional meetings of the TAG, involvement of project staff in selection of specific research topics and locations for field research.

3. Causes of Linkage Failure

181. Usually progress and completion reports do not discuss the linkage issue, but with some excellent exceptions which help to understand why linkages fail, and why they sometimes succeed.

- *Lack of timing synchronization.* A common reason for linkage failure appears to have been the years of delay involved in processing and start-up of the TAG,[87] and on occasion, of the loan project (e.g. TAGs 192-CARDI, 167-ICLARM). In several cases the TAG was just beginning implementation, when the loan project it was to support was already finishing (as in the case of TAG 192 and the *Small Farmers Agricultural Development Project in Saint Lucia*).[88]
- *Lack of agro-ecological, and often geographic, overlap or close physical proximity.* Where loan and TAG projects are in completely different countries, or even in widely separated geographic areas of the same country, it limits linkage potential.[89] The closest collaboration, such as direct coordination of ongoing activities, is only possible where there is overlap of project areas (as under TAG 318-CIAT in Brazil). This aspect is not always considered when selecting areas for on-farm testing (for instance, under TAG 167-ICLARM).
- *Poor information sharing.* It is not enough for the TAG proposal to simply state that it will be linking to IFAD loans. IFAD headquarters staff need to be proactive. In one instance, IFAD did not send any information on the loan in question to the TAG staff until the last TAG project year. In another, the

[87] The review found that it is not unusual for there to be a delay of two to three years, and occasionally longer, between the presentation of the original proposal and start-up of project activities.
[88] There was a similar finding under the OE 1999 evaluation of the NGO/ECP.
[89] In one such instance, the TAG report complained of lack of funds to travel to the IFAD project site.

TAG coordinator had to remind IFAD staff several times to send it. Memoranda of Agreement seem to help sometimes (e.g. TAGs 1-ICARDA on Faba Beans in the Nile Valley, 167a-ICLARM on the Impact of Fish Culture within the Farming System, 308-ICIPE on the Development of Sericulture and Apiculture Technologies for Enhancing the Income Generation Potential of Smallholders in Africa).

- *The TAG lacks usable outputs.* This is detailed in the above discussion on downstream achievements. The review found that technology packages were completed under only about 37% of TAGs. Therefore, technologies for upscaling under loan projects were not always ready when needed (e.g. TAGs 40-ILRI, 216-ACSAD.
- *Financial constraints.* IARCs are usually unwilling to allocate scarce research funds for "additional" activities, and expect the loan project to pay for costs involved in any collaboration. The lack of such budgetary provision has frequently appeared a constraint (as under TAGs 183a, 386-ICIPE on IPM of vegetable crops in East Africa)[90]. A good instance of this working well is the early TAG 136-IITA on the Biological Control of Cassava Pests, where reallocation of loan funds in a number of countries, resulted in spectacular success in Africa-wide control of the cassava mealy bug.

182. One of the factors that helps to catalyze linkages is implementing agency overlap between the loan and the grant. The recently approved small TAG 547-ENDA, provides an illustration of an intimately linked loan and agricultural research grant, though implemented by an NGO. The implementing NGO had previously collaborated with the closing loan project and is implementing grant-funded research, which is intended to prepare for the next loan. In theory, IARCs could perform similar functions.

H. Programme Management

183. The review rated IFAD management of individual TAGs as "satisfactory" in about two thirds of cases and less than satisfactory in a third. The evaluation was based primarily on supervision and extraction and sharing of lessons from the TAGs. However, the judgment was very difficult to make on the basis of scarce information in reports.

1. IFAD's Management of the Programme

184. IFAD management of the AR&T Programme has undergone major changes in recent years. Historically, the programme has been entirely managed by IFAD/PT. Successive PT Directors have traditionally played an active role. A coordinator was first formally designated only two years ago. It is commonly acknowledged, including by PT, that during earlier years, grant selection decisions were highly centralized, with little involvement of regional divisions. In recent years there has been a conscious effort to remedy the situation, to involve regional staff in order to ensure that AR&T financed research is in line with regional strategies and research priorities,[91] and to simultaneously improve supervision of, and learning from the programme.

185. The attention being given to systematizing of the approval process is positive. PMD guidelines were approved by the OSC in December 1997. Screening criteria were discussed in-house and formalized during 2000. A team-based and participatory approach for selection of grants began less than two years ago. Regional divisions not only screen proposals as they come in, but they can contribute TAG ideas, from which a short list is selected of those TAG concepts which meet the AR&T Programme criteria (about

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[90] In one interesting case, TAG 386-ICIPE, the TAG coordinator spent considerable effort holding workshops for IFAD project staff, hoping to try to obtain additional commitment of funds. Although some project staff were quite impressed with the TAG outputs, they had no discretionary funds to allocate for the purpose. Part of the problem is that there were no relevant IFAD projects in the countries where the TAG operated.

[91] The preparation of regional research strategies was initiated by PA. By May 2002, draft regional strategies existed for PA, PI, PN, PL. As indicated by the data on regional distribution of TAGs, and also by the Regional Strategy chart, PF has in recent years indicated a policy of avoiding TAG funding.

ten to 15 selected per annum). The sub-set of research possibilities is then evaluated by the TAG Advisory Committee. PT has also begun a useful process of annual reviews of ongoing grants, starting in 1999. This review performs a number of important functions, and has feedback to grant recipient organizations. Regional staff now also manage a total of 16 grants. Some of these newer ongoing TAGs are very closely supervised, and well linked to projects. However, the survey indicated that grant recipient organizations are sometimes confused in such cases as to who their main contact point is, particularly if the idea of non-PT management is new to them. The main complaint about IFAD management of TAGs in general concerned delays: slow response and slow disbursement of funds and lack of clear guidelines on some aspects of the process e.g. approval, progress and completion reports. Delays during the approval process and unclarity of procedures with several back and forth of the proposal were repeatedly mentioned in the institutional visits.

186. There is, in some cases, a certain justification for approving TAGs for more than three years: frequently staff hiring, capacity building, procurement, and background data collection take one or two years. At the same time much of crop research, for instance, requires at least three cropping seasons to generate sufficient date to reach reliable conclusions, especially if the proposal involves strategic or applied research. Thus, under some situations there appear to be a case for approval of a longer duration programme (four to six years) while the release of funds is pending two yearly reviews. Such an approach would retain the advantages of offering IFAD and the implementing agencies a chance to review progress and make necessary adjustments in the TAG design based on implementation experience before commencing the next phase.

187. The TAG Programme needs attention to efficiency and to further transparency[92] and systematization of procedures. The existing programme guidelines and criteria have now been tried out for an adequate period of time and could now be re-assessed and improved. Additional guidelines are needed for proposal applicants, for supervision of TAGs, and for management of TAGs at the IFAD level. This would encourage further transparency and improve quality (see Chapter V on Main Findings and Conclusions). There are pipeline problems that also need attention.

2. IFAD's Supervision of TAGs

188. **Frequency**. The report-based information on IFAD management and supervision of TAGs is not enough for any meaningful quantification. Albeit, certain general findings emerge on frequency and quality of supervision. First, supervision of TAGs is highly variable, with some intensively supervised and others perhaps supervised only once during implementation of multiple phases. Often supervision cum evaluation missions are fielded towards the end of a TAG, if there is an issue of extension, or, if a subsequent phase has been presented (examples are TAGs 148-IRRI, 167-ICLARM). Mid-term reviews are not accepted practice, although it has been done in a few instances.

189. **Quality**. Secondly, the quality of the supervision is also variable, judging by the reports reviewed. In a rare instance, a completion report of one TAG had actually listed the IFAD supervision missions fielded, by whom (with names), and outcomes/recommendations. The results are not encouraging. In other instances, some reports missed key issues that should have been included in supervision – such as the above-mentioned linkage with IFAD projects. But there are clear exceptions. An ongoing TAG in West Africa (TAG 457-IITA on Improved Yam Technologies) shows the value of early-stage supervision. During the first two years there have been at least two field visits, with IFAD playing a directive role in steering the research towards inclusion of socio-economic studies, farmer participatory approaches, and development of NARS capacity. There is some indication that TAG supervision has improved in quality in recent years. At this point there is too little information for a comparison of regional versus PT management of individual TAGs. A number of IARCs communicated that IFAD involvement at the

[92] For instance, all TAG concepts received should be logged in, and reasons for rejection need to be recorded.

planning (design) process compared to other donors is high, medium for implementation and low for performance monitoring (Table 24).

190. **Budgetary constraints** are an issue in supervision. One solution that has been used by several TAGs, is to include funding under the TAG for IFAD to conduct such activities (examples are TAGs 183-ICRAF on Agroforestery Research, TAG 457-IITA on Improved Yam Technologies in West Africa, TAG 386-ICIPE on IPM of Vegetable Crops in East Africa).[93] However, some PT and FC staff oppose this approach as unethical and subject to conflict of interest. An alternative approach could be to use independent consultants to supervise the project. The consultants could be identified and engaged by the coordinating institution after clearance by IFAD.

Table 24: Donors Comparative Strength in Managing Research Grants: A View from a CGIAR Centre

SCRUTINY

	Planning	Implementation	Performance Monitoring
Low		EU, USAID, JAPAN	**IFAD**, EU, USAID, JAPAN, DANIDA
Medium	EU, DFID, USAID, JAPAN, DANIDA,	**IFAD**, DFID, BMZ, DANIDA	BMZ, CIDA
High	**IFAD**, BMZ, CIDA	CIDA	DFID

I. Poverty Impact

191. Technology is a factor in poverty. People need technologies to make best use of resources. One of the many reasons the rural poor are poor is because they lack improved scale-neutral technologies, and the know-how to use them well. Agricultural research can potentially make available technologies to increase own-farm production, lower the costs of production, reduce livelihood shocks due to climatic and other factors, and increase the amount and quality of food available for the family. It can also have a number of additional indirect benefits such as providing more agricultural employment opportunities and better farm wages, lower food prices for all consumers, and generally benefit a wide range of rural and urban people.[94]

192. Therefore in theory, and as estimated on the basis of returns to agricultural research, it can have a major impact on poverty. The difficulty lies in proving such impact on a case-by-case basis. In the AR&T Programme TAGs, lack of reliable data is a major factor. To quote the PN draft assessment of TAG impact: *..assessing the impact of the IFAD TAG programme on rural poverty is a difficult task for at least two reasons: i) the paucity of data and ii) the lack of benchmarks against which TAG-induced progress could be compared. Moreover, although the technology and knowledge generated through the TAG programme have most probably contributed to smallholders' welfare, it must be clear that the latter mostly depend on multiple other factors that are well beyond the scope of the TAG programme...*[95]

193. In sum, the *impact of agricultural research on poverty is indirect, partial, and difficult to assess.* It is also highly complex, uncertain and changeable over time. But poverty impact is the Fund's Mandate, is part of the expressed rationale for the AR&T Programme, is an acknowledged purpose of research done by

[93] In one case supervision was combined with "contingencies" in the budget, totaling USD140 000 for three years, but normally it is more modest – around USD5 000 –15 000 pa.
[94] One of the better discussions of poverty impact used by the evaluation is, Peter Hazell and Lawrence Haddad, *Agricultural Research and Poverty Reduction,* available in both a short brief (Brief 70) and several longer versions (including 2020 Vision Discussion Paper 34) on the IFPRI website –www.ifpri.org
[95] PN/IFAD, *Assessing the Impact of IFAD TAG-Programme on Agricultural Research & Technology Transfer in the NENA Region (1980-1998), Working Document,* Rome: November 2001.

CGIARs,[96] and is expressed in the goals of the majority of TAGs. For all these reasons, the present evaluation needs to address poverty impact to the extent possible.

1. Rates of Return on Agricultural Research

194. Compared to other investments, agricultural research is a relatively low cost activity. Emphasis is often placed on the potentially large benefits from this research. But such benefits are far more uncertain in nature than usually acknowledged. This is a point made by CIP in its volume of case studies on economic impact of technology. In a portfolio of research projects, only some will result in technologies that farmers will adopt. For instance, between 1932 and 1979, 182 improved potato varieties were officially released in the United States and Canada, but only 30 of those varieties ever became popular enough to account for more than 1% of the area planted in any year in farmers' fields.[97] While this may be below the performance achieved for other new crop varieties (in rice, cassava) and in other countries, the basic point is relevant: not all released or disseminated technology is adopted.

195. Thus estimating the returns to agricultural research is a crude exercise, because of assumptions made, the difficulty of quantifying gains and apportioning credit to each of several sources. Keeping this in mind, Alson surveyed 294 studies of rates of return to agricultural research, containing over 1800 separate estimates. Omitting extreme and clearly inaccurate cases, annual rates of return still averaged 73%.[98] This high rate suggests that agricultural research is a very profitable activity. Some studies, which have surveyed the rates of return to agricultural research in developing countries, have found rates of return to be comparable.

196. The case of Africa provides a macro-level illustration. A number of case studies that have been done, have estimated returns far in excess of the opportunity costs of capital. For instance, Masters et al. (1997) reported returns over 20%, and many have estimated them to be much higher.[99] This suggests that most of the agricultural research conducted for this region has been highly effective. Given the importance of agriculture to African economies, poverty should have been vastly reduced. But this is not the case. While climatic and other socio-economic problems can be blamed, part of the reason also lies in the nature of poverty impact of research but more importantly the multidimensional nature of the development process.

Box 14: Impact of Biocontrol of the Cassava Mealybug

Cassava is the staple crop of 200 million Africans, primarily the poor. In the seventies a new pest known as the cassava mealybug began to devastate cassava fields throughout Africa. TAG 36-IITA supported the research programme involved in its control. The solution was found in a tiny wasp from Paraguay. After careful study, it was disseminated in Africa in the eighties. Thus the solution did not involve expensive pesticide inputs by the poor, but was essentially "free." By 1994, some USD 27 million had been spent on CM control. The benefits to poor farmers whose fields were saved were estimated at 4500 million dollars, or more than 160 times the cost of the control measures. [100]

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[96] TAC Secretariat, FAO, *Impact Assessment of Agricultural Research: Context and State of the Art,* Rome: April 2000, p. 1.

[97] Thinas Walker, Charles Chrissman, *Case Studies of Economic Impact of CIP-Related Technology,* Lima, Peru: CIP, 1996, P. 2.

[98] ---Alston..1998

[99] The World Bank, *What is the Impact of Agricultural Research in Africa?,* www.worldbank.org

[100] Main source: L. D. Swindale *Globalization of Agricultural Research: A Case Study of the Control of the Cassava Mealybug in Africa,* available on: www.worldbank.org.

2. TAG Learning about the Nature of Poverty Impact

197. **Experience under the TAGs confirms that attribution of poverty impact of agricultural research is complex, based on a number of assumptions.** It occurs indirectly, through the impact of research on agricultural productivity, and through increased productivity, on a variety of other aspects at micro and macro levels. TAGs such as 411-CIP have produced well-done evaluations that show this process. But both the connection of improved technology outputs to agricultural productivity and of increases in productivity to poverty alleviation, have multiple causal or conditioning factors, of which agricultural research is only one. TAGs have also shown that there is a time-lag between technology adoption by the better off and those who are poorer (e.g. TAGs 120-IFPRI, TAG 167a-ICLARM), which agrees with sociological research on diffusion of innovations. Furthermore, there is indication that it should not necessarily be assumed that adoption of technology is equivalent to benefits, *especially* in the case of the poor.[101] A survey of farmers conducted by the above quoted PN regional impact assessment found that 25% of surveyed farmers indicated no impact on productivity from improved varieties. An adoption and impact study of agricultural and non-agricultural technology conducted by ICARDA for an IFAD loan project, in which ICARDA was also a major partner (MRMP-I in Egypt), discovered that poorer farmers were far less likely to have achieved increases in productivity or income from the technologies they adopted, than were the medium or large farmers.[102] These findings show that poorer farmers often do not have the needed asset-base to make adequate use of new technologies, *even if they adopt them.* For instance, if the new lentil varieties are developed to have good standing ability (adapted to mechanical harvesting – TAG 362-ACSAD), the research outputs may result in considerable benefits to farmers in Syria, Turkey and Sudan who can afford machinery – but not to poorer farmers who can not.

198. **The multiple livelihoods of the poor further complicate the attribution problem.** This is almost invariably missed by impact assessments of all kinds. Poor people's many part-time livelihood strategies mean that often an improvement in one, such as own-farm production (particularly if accompanied by the need to invest more time, or inconvenient time), can result in a loss on another dimension – such as wage income. This is one reason why the technology under TAG 192-CARDI could not have more impact: ruminant owners in the Caribbean were "part-time" and did not want to take time from their off-farm jobs to spend more on livestock management, particularly since for some the latter was only a weekend activity, and there were no market incentives. Again, a gain for one member of the family, may be a loss for another – often, as experience has shown – for women (as in the case of cash cropping evaluated under TAG 120-IFPRI).

199. **Gradual erosion and reversals can occur in impact over time**. There are many possible reversals or reductions in impact over time, due to changes in adopted practices, loss in effectiveness of the technology, capture of benefits by the better off, or market factors where a widespread increase in productivity, not paralleled by an increase in demand, ends up lowering prices. At times, a positive impact for one group of the poor means a negative impact on another. These are discussed and illustrated in the below section on sustainability of impact. The TAGs have underlined all these and more impact complexities and lessons. Most of these lessons have not been extracted.

3. TAG Performance of Impact Assessment

200. **Frequency of impact assessment**. In the sample, impact evaluation studies were available for less than a quarter of the sample TAGs. But institutional survey results argue that about two thirds of the *research programmes* which IFAD co-financed had received an impact evaluation. Several others are

[101] This is a very common assumption, including under the PN Impact Assessment of TAGs.

[102] A summary of this very interesting study is provided as Appendix I, to *The Arab Republic of Egypt – Matrouh Resource Management Project Phase II, Formulation Report, Volume I: Achievements and Design Implications,* Rome: IFAD/PN. Some of the agricultural technologies involved probably had been developed under IFAD supported TAGs, although this is not noted. They included : barley and horticulture – especially fruit trees.

currently under way (including TAGs 350-ICLARM, TAG 385-ICARDA/IFPRI, TAG 411-CIP, TAG 444-IFDC). Institutional visits also clearly demonstrate that the CGIAR system is devoting increasing attention, partly under donors' pressure, to impact assessment. Contrary to popular belief, impact evaluation is not new for TAGs, and predates IFAD's own institutional attention to the issue by some 20 years (see below box). Most of the IARC respondents understood such impact evaluation as occurring at the user level, although a few also had institutional capacity development impact in mind (as below). Clearly, many impact studies that have been done are not in IFAD files. Where IFAD has not received such evaluations (that is, they have not been received and misplaced), a reason could be that the evaluation was done after the TAG completion, because of shortages of time and money. This is logical, since the IFAD supported research has usually only been one short slice of an ongoing programme. Follow up on impact assessments made and appropriate documentation, dissemination of results is an area needing more attention in IFAD.

Box 15: Examples of Impact Evaluations by one IARC - ICARDA

TAG 1 - Applied Research on Broad Beans in the Nile Valley - Economic impact and farmer adoption studies undertaken for recommended production packages.
TAG 264–Research Programme for the Development of Sustainable Crop/Livestock Production Technologies in the Low Rainfall Areas - Technology adoption studies undertaken. Impact evaluation studies are ongoing.
TAG 306 – West Asia and North Africa Dryland Durum Wheat Improvement Network (WANADDIN) Programme (ICARDA/CIMMYT Joint Programme) – Assessment of the economic impact of durum improvement research in the region.
TAG 385 – Integrated Crop-Livestock Production in Low Rainfall Areas in Mashreq and Maghreb - Technology adoption studies undertaken. Impact evaluation ongoing in collaboration with IFPRI.

201. **Nature of impact assessments done.** The conduct of impact assessment is limited by many factors, including those which inhibit impact itself (see section below). Where a completed transferable output has not been achieved, or, there has been no chance to implement demonstration or pilot activities, it is not possible to have meaningful measurement of impact at the grassroots level. Where it has been possible, and studies have been done under TAGs, impact evaluation is also more likely to be done in terms of what the Impact Evaluation Group of CGIAR terms "partial impact" or "pre-impact."[103] This usually looks at the effects of new technology on farm productivity and perhaps even farm household welfare. Comprehensive economic impact assessments, with rate of return analysis, appear to be infrequently done. Some of these "pre-impact" studies (contrary to what is stated by the above IAEG/CGIAR publication) are done with both ex-ante and ex-post measurements and even control situations. Cost-benefit ratios are also sometimes calculated, though in a simpler way than under economic analysis. Economic impact studies have been done or are being presently done in a few cases (such as TAG 411-CIP).[104] The limited number of impact studies available for review for the sample TAGs, combined with their variable quality, is insufficient for arriving at any reliable general conclusions on poverty impact achieved, although they do throw light on processes and constraints involved.

4. Minimal Conditions for Achieving Poverty Impact

202. In order to provide some overview of the general situation of the AR&T TAGs in terms of poverty impact, in a situation where actual data on impact is extremely limited, the present evaluation uses an adapted *APADM (Appropriate Products-Available Dissemination Mechanisms)* approach to assessing

[103] IAEG/CGIAR, *Impact Assessment of Agricultural Research: Context and State of the Art,* TAC Secretariat, Rome: FAO, April, 2000.
[104] CIP, *Case Studies of the Economic Impact of CIP-Related Technology,* is a very useful publication and includes case studies of technology impact similar to that being validated and disseminated under TAG-411, but pre-dates the research supported by that TAG. However, CIP is producing several adoption studies on TAG-411, which are well done and contain considerable useful learning.

poverty impact. TAGs have been operationally defined as having short-term poverty impact *potential* if they can meet the following four simple criteria:

- *TAGs have completed outputs ("products")*
- *The outputs are appropriate to resource-poor farmers*
- *There are no major constraints to production or dissemination*
- *Linkages have been made to a dissemination system or mechanism (such as extension, NGOs, donor projects)*

203. It is important to recognize the difference between poverty impact *potential* and *actual* poverty impact (as above discussed).

204. *Impact condition #1: Technology outputs have been completed.* As noted under technology outputs, roughly 60% of the TAGs show evidence of having completed an output that is either a physical technology that can potentially be used by farmers, or, a practice which can be adopted by them. Illustrations of projects and constraints to completion of technologies have been noted under that section. However, while some of the technology outputs have been noted as "ready" by the reports, sometimes more minor technical problems remain to be resolved.

205. *Impact condition #2: Outputs are appropriate to resource poor farmers.* In those cases where technology outputs had been completed, the evaluation assessed 41% to clearly appear appropriate to, and potentially adoptable by the types of resource-poor farmers for whom they were intended. In such instances, the technology was scale-neutral, affordable (low-cost), suitable (particularly in terms of low-input and match with existing practices) and liked by farmers. Or else, the technology would solve production problems without any need for actual "adoption" on the part of farmers' part. Examples of TAGs which fell into the latter category were those technologies which relied on natural predators for control of major pests of basic food crops, at no cost to the farmers (TAGs 36-IITA, 136-IITA on the Biological Control of Cassava Pests); TAGs which were both relatively inexpensive and developed on the basis of indigenous technical knowledge, with good farmer participation in the process (TAG 308-ICIPE, TAG 330-ICRISAT). In the case of the 59% of TAG generated technologies with constraints to adoption by poorer farmers (but not necessarily those who were better off), they fell into the following groups:

- The technology assumed access to or control over resources that the poorer farmers did not have – such as good quality land, secure land tenure, water rights, transport (e.g. TAGs 1-ICARDA, 40-ILRI, TAGs 167-ICLARM, 362-ACSAD, 332-IDRC/INBAR).
- The technology was too costly, usually because it was too input intensive or machinery dependent (e.g. TAGs 1-ICARDA, TAG192-CARDI, 40-ILRI, 284-ILRI, 362-ACSAD).
- The technology did not match existing practices or preferences of farmers (TAGs 40-ILRI, 183a-ICRAF, 192-CARDI).

206. *Impact condition #3: There are no major constraints to dissemination.* In many cases there was too little information to make a judgment on this indicator: pilot testing, demonstrations or dissemination had not taken place and no constraint analysis information was available. However, some TAGs had gone further than others in actually pilot testing some or all of the technical outputs, with the result that such learning was available. Or information on constraints became available and was collected during farmer participatory research. The types of constraints that were noted, which could endanger dissemination and therefore reduce or even preclude poverty impact, were:

- *Constraints to dissemination of the technology* because of lack of extension or other suitable dissemination system. This is more critical in certain cases. Some technologies are more easily transferable and less reliant on continuous or long-term external support than others. For instance, new locally-adapted varieties of already existing crops can be introduced quite easily, as long as seed can be made available, and no major new practices or other inputs are required. On the other hand, in complex farming systems, such as agro-forestry and in resource-management activities, new farming and cropping strategies are required and longer-term learning processes are involved. Two examples of TAGs which appeared to have possible problems for this reason are TAGs 183a-ICRAF, 362-ACSAD).

- *Constraints to production of the technology*: The issue has come up in several cases and appears to be one that should be addressed more frequently at the proposal stage. The earlier mentioned PN impact assessment notes private sector involvement as important in manufacture and delivery of feed-blocks for livestock, and in the manufacture of small machinery which is not commercially available. TAG 320-FAO is presently trying to find a solution to the problem of cheap local manufacture, in the Caribbean, of the Duncan Applicator, for bont tick control. Lack of input suppliers was discovered to be a problem in using neem in Uganda under TAG 386-ICIPE, after it had been tested. The below note on policy constraints is also relevant here.
- *Policy level constraints:* Government regulatory constraints to implementing the tested IPM solutions were discovered rather late in an otherwise very well implemented TAG 386-ICIPE (IPM of vegetable crops in East Africa). As pointed out by the IFAD evaluation mission: *These issues should have been checked and clarified in advance, before starting the project, or resolved at the institutional level at least at the beginning of the project, and the testing required for registration should have been performed.*

207. *Impact condition #4: Linkages have been established with a system for dissemination.* Review of reports showed that, in those instances where it was applicable (that is, an output was intended to be produced which should be disseminated) and information was available, some 61% of TAGs had established linkages with extension or another dissemination system. Both the frequency of linkages and the CGIAR versus non-CGIAR pattern was very close to that of the survey responses (when noting partnerships with extension, see above).[105] In the earlier multi-phase TAGs, which began with more upstream research, this type of linkage to extension was usually established during the last phase, as in the case of TAG 1-ICARDA, which provided training to extension service staff and involved them in demonstrations in order to ensure smooth transfer of technologies to farmers.

208. The three main types of linkages to extension that were established were:

- *Inclusion of extension staff in the Steering Committee of the TAG* (e.g. TAGs 386-ICIPE on IPM of vegetable crops in East Africa, and 216-ACSAD). This is a good approach as it allows extension to be involved from the beginning and to have a formative role in the research.
- *Involvement of extension staff in field research activities* (e.g. TAGs 136-IITA on the Biological Control of Cassava Pests, 167-ICLARM, 361-IPGRI). Sometimes this appears to be done more because NARS cannot get out to the research sites, than for the purpose of creating a linkage to extension for purposes of future dissemination.[106] In other instances, as with IITA, extension staff were involved in monitoring the establishment of the natural enemy (*Epidinocarsis lopezi*) of cassava mealybug during ongoing research, which was useful, as they would need to continue to monitor its activities after research completion.
- *Training of extension staff in the technology, to prepare them for dissemination of the completed technologies/technology packages* (e.g. TAGs 72-IITA, 362-ACSAD: Sometimes preparation of relevant extension materials also takes place. This is probably the most meaningful and useful linkage in terms of potential for dissemination of the technology. ACSAD (TAG 362) actually conducted some

[105] The survey found that a total of 57% of respondents noted partnerships with extension systems which is very close to the review results.

[106] In some cases it was clear that incentives for extension staff involvement were a problem, and reduced the quality of performance.

21 training courses for researchers, extensionists, and farmers together to teach them new techniques and use of machinery.

209. The data is insufficient and too unreliable to estimate the percentage of TAGs that could be considered to have met all of the APADM criteria. A ball-park estimate would be around 25% to 30%, but this has to be interpreted with care, as a margin of error exists upward and downward. The above mentioned framework can possibly be used, by IARCs (or IFAD missions) in preparing TAGs completion/impact assessment reports.

5. Sustainability of Poverty Impact

210. The review assessed the likely sustainability of benefits in the context of internalization of technical, socio-cultural and environmental issues addressed through the TAGs. Where some information was available to make some sort of judgment, around half of these TAGs were found to generate benefits that are likely to be sustainable. Other information from both review of reports and the institutional survey and visits have illustrated that impact may erode over time. Among the possible causes found were:

- *Weak control over assets*, as in the case of landless fish farmers, studied under TAG 167 and 167a-ICLARM. Where they rented water bodies and successfully stocked them with fish, the owners would often take them back when they became profitable.
- *Erosion of new practices*: Once project or extension activities cease, usually some of the adopters of new practices will revert to the old way of doing things. This has also come up in other TAGs, but one of the best illustrations is under TAG 167a-ICLARM (see below box).
- *Erosion of the technology effectiveness:* One illustration of this is the erosion in resistance that occurs in disease resistant varieties when used by farmers. CIP (TAG 411) estimates for instance, that the late-blight resistant potato varieties will probably decline in effectiveness in about eight years once they are in the hands of farmers. Pesticides and natural control measures can also lose effectiveness, as recognized under TAG 320-FAO in the case of bont tick control in the Caribbean.
- *Institutional Failure:* Institutional support systems, such as market linkages, or input suppliers, that are needed for sustaining poverty impact may fail. As recognized by IICA (TAG 321) it is very important in biological control activities to plan for sustainability. Therefore, attention has to be given up front to the issue of developing institutional financial and human resource capacity for monitoring continued effectiveness of control measures.

Box 16: Erosion of Poverty Impact

TAG 167 and 167a ICLARM evaluated fisheries extension. A main finding is that the impact of extension tends to erode over time. One reason is lack of sustainability of practices. They found that once the extension stopped, fish farmers started ignoring or forgetting their instructions. This applied in particular to the poorer households, for a variety of reasons. They began to overstock the fingerlings (up to seven times the recommended stocking rate among poorer operators, and three times among market oriented operators). In the case of fertilizer, they began to lower the doses of chemical fertilizer below the recommended levels, but to overdose the organic fertilizer (cow dung, chicken droppings), probably because it was cheaper. Other incorrect practices also crept in. These changes reduced net returns. But to the fish farmers, what they were doing was rational – more so than what extension had taught them. The reasons given for overstocking illustrate: (i) to have more for consumption; (ii) poor survival rate of fingerlings; (iii) otters were consuming a proportion of the fish; (iv) poachers were stealing some of them, so they had to have extra.

211. While some of the factors that affect sustainability of impact can be positively influenced by the design and implementation of research and technology dissemination, others are due to political, financial

and social factors beyond control of the AR&T programme. But this erosion of impact argues again for evaluation of impact after the activities have withdrawn – at least a year or more afterwards.

6. Lessons on Impact Evaluation

212. Four impact evaluation issues were clearly brought out by the respondents to the evaluation survey, which IFAD should view as lessons that have been learned by IARCs over the years.

213. **The short duration of TAGs undermines meaningful evaluation**. Several IARCs (including CIAT, ICARDA, ICLARM, IFDC, ILRI) mentioned that the three-year time period of a TAG was too short for impact evaluation purposes. In fact, it was argued that a reasonable time should be allowed to lapse after introduction of a new technology at the field level before any impact evaluation, in order to capture all the important effects, including some erosion of impact over time. A five to six-year duration of a TAG would therefore permit a measurement of *before-and-after* instead of just *before-and-during*, when project activities are still ongoing and motivation is being artificially supported. Or, funding should be made available to be used for impact evaluation at a later stage, following TAG completion. Quoting one respondent: *The impact of the project's activities is likely to take longer (than three years). Therefore, it is unrealistic for donors to expect impact evaluations at the conclusion of a project. Provision needs to be made for the conduct of impact evaluations following termination of a project.*

214. **Lack of budgetary provision imposes constraints on impact assessment**. The issue of budgetary provision for evaluation was equally strongly stressed, for instance by ICARDA, ICIPE, CIP, ICLARM, CYMMIT and IITA. At present, funds are rarely earmarked in TAG budgets for the purpose. As a result, impact evaluation may not be done, may be half done (ex-ante only, waiting for a second phase, as in the case of ILRI), or done under funding from other donors, with the report perhaps not sent to IFAD. Quoting the advice of one IARC to IFAD, which had received funding for this purpose from other donors and was now conducting extensive evaluations of the IFAD financed TAG: *Impact evaluation is a resource-consuming activity.... However, all projects should have an impact evaluation component and specific budget allocated to it. This means, specific budget line for baseline studies, monitoring and final evaluation. In this way, institutions could conduct evaluations with their staff or hire external consultants.* One IARC noted that where an impact evaluation can not be done in all participating countries, because of resource constraints, at least it should be done in one or two, with the results shared among other partners.

215. **IFAD needs to clarify what it expects from impact evaluation**. Impact evaluation of agricultural research now has a number of approaches, ranging from purely qualitative to highly quantitative and from social, through socio-technical, to economic. They have vastly different human resource, time and budgetary requirements. Therefore, a few of the IARCs (e.g. CIAT, CIP) have noted the need for guidance from IFAD, not on how to do such evaluations, but what IFAD expects in terms of impact evaluation. Quoting one IARC: *The impact-evaluation unit at IFAD should provide guidance, at least on a minimum set of requirements, to harmonize evaluations and make it possible to do comparative studies.* And another*: IFAD can assist by indicating agreed time scales, methodologies, expected deliverables, etc.* However, the responses to the survey and the review of reports suggests that whereas some IARCs have a high level of technical competence and in-house trained staff for impact evaluation, others do not, and also need technical guidance.

216. **There are often evaluator deficiencies**. *Most IARCs seem to welcome the idea of an external evaluation to look at the project "with fresh eyes", as long as the evaluator is appropriate and works with project staff. One of the most critical issues in evaluation was felt to be the choice of the individual consultant. What one IARC noted gave a clear impression of less-than-satisfactory experience in the past:* The advantages of having an outside party who comes with fresh eyes are often outweighed by the consultant's own interests and lack of full understanding of the project. The best consultants obviously are

those who take time to read the documents, listen and go to the field. They are ideally familiar with the local language and even the project to some extent. Some are too busy or feel their own ideas are too important to do this. The worst consultants are those who have a single theme that they harp on which often reflects more about their own recent experiences than that of the project.

J. Institutional Impact

217. The TAGs appear to have performed better on institutional impact than on poverty impact. Several survey respondents observed that such institutional impact should be considered to be an important dimension of TAG impact. However, methods for its assessment have received less attention than those for impact on production, adoption or economic impact. On the basis of available information, the majority of TAGs could be said to have achieved a satisfactory institutional impact. IFAD has played globally an influential role in sharpening the CGIAR system focus on pro-poor agricultural research. At the level of individual TAGs interest and impact on policy have been less pronounced.

1. Impact on Financing of Pro-poor Research

218. Although such information is frequently lacking in reports, it is clear that many TAGs have had a catalytic impact on both donor and government financing of pro-poor research. The review found IFAD to have been a lead donor in about two thirds or more of the sample of co-financed TAGs. At times IFAD support opened up an entirely new area of pro-poor research, as in the case of previously unresearched crop. Plantain is an example of a crop which had up to then been viewed by researchers as an insignificant backyard crop (TAG 72-IITA). On other occasions, IFAD has played a major role in shifting the focus of an area of research from commercial/large farmer needs to systematically addressing the multipurpose needs of small farmers, as with TAG 361-IPGRI research on coconut.[107] This one-phase TAG leveraged both national funding and other external funding for follow-up country-level pro-poor coconut research, totaling about USD 13 million. TAG 263-IRRI on the Development of Sustainable Rice Farming Systems in Southern Asia had a catalytic convergence with Government of India development programmes on remote sensing and agro-meteorology thus attracting additional resources for research on eco-system analysis and development of location specific rice and rice-based technologies.

219. The review and institutional visits indicate that the Programme has positively contributed to raising awareness of and enhancing *capacity* for pro-poor participatory research at the level of the grantee institutions. While it is not possible to quantify influence on resource allocation, increasing demand for this type of work from key donors is encouraging institutions to invest in expanded capacity for pro-poor research.

2. Impact on National Level Research Capacity

220. **Nature of capacity building.** Capacity building of NARS has been an explicit objective of a significant number of TAGs. Even when not an objective, to a lesser or greater degree, almost all IFAD financed TAGs have been engaged in NARS capacity building.[108] The majority of the TAGs reviewed have achieved some positive impact on NARS capacity and at least 50% have achieved a significant impact at this level. Most IARCs, and particularly CGIARs, view it as an essential activity, and often the most rewarding one. Even apart from explicit capacity building, IARCs note that when they have to work with NARS with varying capacities, they have to be prepared to invest extra effort and more financial resources

[107] This TAG is noteworthy in terms of the well thought out systematic approach, good management, excellent reporting and high level of impact. It is one of the few which could be considered to have "more than" achieved its objectives. However, the relative importance of coconut to smallholders can be disputed.
[108] The need for such capacity building has varied among regions and countries.

to the weaker ones, if they are to be fully participatory members of the programme. But several mentioned that this effort has paid off. A variety of approaches have been used by TAGs. They include:

- Short-term training on research approaches or topics, through workshops or short-term courses. These are often on well-defined methodological topics such as: multi-disciplinary research, impact assessment, farmer-participatory research, gender issues. Training is sometimes also provided on thematic topics in research, sometimes involving extension staff as well as researchers (including IPM, camels, agro-forestry, bamboo and rattan). Some TAGs have trained more than 100 scientists (in one case, 500). Certain IARCs argue in particular for hands-on training, and one gave a strong argument for focusing on training of younger scientists who are more committed.
- Short term general skill training, to fill skill gaps in accounting, report writing or data analysis, which would affect the quality of outputs and reporting.
- Higher level degrees. Several TAGs have financed out-of-country Ph.D. and M.Sc. training for researchers (TAG 386-ICIPE and others). Other TAGs have contributed to in-country training by providing field research opportunities for graduate students (TAG 216-ACSAD and others).
- Provision of laboratory equipment or other essential capital items needed for research.
- Technical and methodological support and advice, which may include development of guidelines in local languages, and facilitating interaction with international experts.
- Exchange of materials, information and visits.
- Networking, which has been sometimes established in follow-up to completed training, to help in implementation of new approaches, such as participatory methodologies, when the institutional environment may not support it.
- Collaborative planning and evaluation with NARS, which itself helps to develop their capacity.

221. Most often the national-level capacity building has occurred through short-term training, often in regional level workshops or travelling workshops. In some instances, extension agents and field technicians have also been trained in research (as under TAG 318) for their role in the TAG. Although usually performed by the IARCs, NGOs have sometimes taken on the role, as under TAG 318-CIAT. Some illustrations of such training: TAGs 72-IITA (training of social scientists); 183-ICRAF (training for agro-forestry research); 318-CIAT (training of extension agents and field technicians in cassava cropping methods and participatory field research methodologies); 216-ACSAD (workshops for "intellectual exchange on camels"); 263-IRRI (Development of Sustainable Rice Farming Systems in Southern Asia), 375-ICARDA/CIMMYT (extensive training in participatory approaches and methods). One of the most comprehensive researcher capacity building initiatives found was under 361-IPGRI. The training provided for its 14 NARS partners covered: farmer participatory socio-economic research, technical report writing, data analysis, cost and return analysis (for intercropping projects).[109]

222. **Impact of training on performance**. While implementation of training may improve the knowledge and skills of participants, it may or may not achieve an impact on work performance. Many respondents to the institutional survey highlighted constraints to impact of the training on actual practice, even in the actual TAG itself which provided the capacity building. This problem derives from the serious financial and human resource situation of the NARS in many countries. With some NARS in Africa, the situation is aggravated by HIV/AIDS. Not only are the right staff not always nominated for training (particularly for overseas training), but they may not return to their previous jobs. There is a high level of rotation of national staff in some countries, in search of better salaries. Staff are also often transferred within the organization, upon their return from training. In several cases, they have been "poached" by NGOs, bi-lateral donors and UN agencies. Use of training acquired can also be hampered by lack of the necessary equipment. Or, the government research philosophy and institutional culture may contradict the

[109] Judging by the unusually high quality and regularity of NARS reports under this very well managed TAG, the training seems to have paid off. Other TAG grantees may want to consider it.

training received, as where scientists have learned participatory approaches to research, but work in institutions which are traditional in approach and do not permit innovation to enter.

3. Impact on Policy or Strategy

223. **Global impact of the Programme**. The review attempted to assess the extent of IFAD impact, through the TAG Programme and individual TAG projects, at the level of CGIAR, GFAR or other global coordinating bodies. IFAD, along with FAO, World Bank and other major donors has been a strong advocate for pro-poor agricultural research and succeeded in bringing about much sharper focus on these issues in the work programme of the CG system. Another area of influence has been the catalytic role played by IFAD in increasing funding and status of research on neglected crops of importance to the poor. Examples include the successful TAG-72-IITA which directly promoted the West African Regional Cooperative Research on Plantain (WARCORP), a regional network for research cooperation and contributed to worldwide interest which eventually led to establishment of International Network for Improvement of Banana and Plantain (INIBAP) under the leadership of IDRC. Other examples are TAG 257-IDRC and TAG 332-IDRC which extended support to bamboo and rattan research in Asia and Africa and helped to leverage funds for establishment of the International Network for Bamboo and Rattan (INBAR). At another level, some highly successful IFAD funded research in TAGs36-IITA, 136-IITA and 412-IITA on biological control of cassava mealy bug and green spider mites, have marshaled sustained international donor support for research on pest control.

224. **Policy impact of individual TAGs**. Only about 25% of TAGs in the sample had significant policy or strategy objectives at regional or national levels. Probably about half of these actually achieved some degree of policy impact. The two-year TAG 364-CEDARE, can be viewed as having made an important contribution to a critical policy issues affecting Egypt, Chad, Sudan and Libya - the development of a regional policy and strategy for management of the Nubian Sandstone Aquifer System. TAG 318-CIAT, building on a long history of cassava research supported by IFAD over the years, made a contribution to development of a global policy for cassava. Other TAGs which have made policy-relevant contributions include: TAG 216-ACSAD, which created awareness and interest in camels at the national policy level; TAG 181-ICRISAT, which by working closely with key government policy making bodies influenced policy for production, processing and marketing of oil seeds crops in India; TAG 257-IDRC/CIFOR which enhanced the priority given to bamboo at the policy level in China and Bangladesh, and TAG 264-ICARDA which helped to improve understanding of relationship between government policy (e.g. for livestock products) and uptake of production technologies in several countries of NENA region. Some newer TAGs are explicitly building in activities for policy level dialogue and influence (as in the case of the ongoing TAG 531 on community-based fisheries management in Bangladesh and Vietnam).

K. Knowledge Impact

225. The review found that almost all TAGs had generated lessons of one kind or another, which were worth disseminating. Actual dissemination performance, and therefore, impact on knowledge management, was weaker. Often the knowledge generated by TAGs has been only disseminated to a small group of "network" researchers, and not reached the larger development community or farmers. IFAD's own staff often complain about this issue. Thus, it appears that both the international coordinating centres and IFAD seemed to have under-performed in this area. TAG generated knowledge can potentially be disseminated through a number of channels, including: Technical Advisory Notes, scientific journals and scientific conferences; networks; and IARC information/documentation centres. IFAD/PT has made a special effort in recent years to make Technical Advisory Notes an important mechanism for TAG knowledge dissemination.

- *Dissemination through TANs:* Technical Advisory Notes (TANs) are viewed by IFAD as a key vehicle for dissemination of TAG research findings to a wider development audience, both inside and outside IFAD. Since 1998 [S.M.] theoretically, all TAGs are supposed to produce TANs. To date, PT reports that at least 55 have been produced and an estimated 15-20 will be placed in the IFAD Website. These TANs provide good, user-friendly presentation of relevant findings. But, as correctly observed by PT in the 2000 PPR, they could be more useful if they clearly stated *the category of potential users of the technology described, the constraints to its adoption and the region/agro-ecological zones targeted (i.e. recommendation domains for the technology)*[110] – that is, under which circumstances the research findings or technology was usable, and in which circumstances it was not appropriate. There is probably quite a wealth of additional information in the TAGs that have not been extracted and packaged for dissemination, including on methodological and social issues.[111]
- *Dissemination through scientific journals, conferences and Sourcebooks:* Reports of some TAGs note that they have generated numerous scientific and conference papers. Some examples: TAG 284-ILRI has generated some 27 scientific papers and 24 conference papers on trypanosomiasis control. TAG 308-ICIPE has been the basis for at least ten staff articles in international journals, TAG 263-IRRI (on the Development of Sustainable Rice Farming Systems in Southern Asia) in addition to scientific publications, has also produced a sourcebook of best practices and strategies for rainfed rice production in Eastern India.
- *Dissemination through networks:* About a quarter of TAGs have established networks of one kind or another, usually of researchers, and much less frequently, mixed networks which include researchers, extensionists, IFAD project staff and occasionally farmer association representatives. Often these have served for information sharing in addition to any research coordination function they perform. Sustainability of such networks is not known. Occasionally, grantees have taken the initiative to set up more grassroots level networks for technology dissemination purposes (as done by ICRISAT under TAG 330, 263-IRRI on the Development of Sustainable Rice Farming Systems in Southern Asia).
- *Dissemination through IARC information centres:* Some TAGs have strengthened institutional information centres (as in the case of TAG 216-ACSAD) which were to serve information dissemination goals, including of the ongoing TAG.

L. IARCs Recommendations to IFAD

226. The survey of grant recipient organizations invited them to make recommendations to IFAD on ways for improving the AR&T agricultural research programme. In general, IFAD was commended for its consistent focus on poverty relevant research. The recommendations made for main Programme improvement are summarized in the boxes 17 and 18.

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[110] Technical Advisory Division/IFAD, *Year-end 2000 Project Portfolio Review for PT-managed Agricultural Research Technical Assistance Grants,* Rome: December, 2000, p.4.

[111] In the case of some TAGs it would be very easy to extract small learning notes or similar. In one instance, there were close to 100 references attached to a report of a variety of publications, newspaper articles and similar, generated by the network of NARS researchers, on post-harvest technology. Some of the untapped non-technical lessons include subjects such as: sustainability of technological change; participatory monitoring and evaluation; impact evaluation; indigenous technical knowledge and many others.

Box 17: Strategic Recommendations of IARCs to IFAD

To improve the overall impact of the TAG funded research:

- IFAD should consider a medium to long-term commitment (ten to 15 years), which would be more effective than support of isolated small research teams and activities. Many of the types of activities financed can also not achieve their main objective within a three-year period, or, do not allow meaningful impact evaluation in such a short period of time.
- Extension of the duration of individual grants to five to six years to allow research and dissemination of the technology to take place. A variation, suggested by a few was to employ a two-phased commitment approach, whereby the first phase would focus on technology development and the second, on technology dissemination.
- Research proposals should build on previous research experience and existing organizational partnerships in order to be efficient and effective.

To improve the linkages between TAGs and loan projects:

- IFAD should list research topics that fit the goals and objectives of ongoing or pipeline projects, state selection process and deadlines, and invite research institutions to develop funding proposals to address the various topics (competitive basis, perhaps with external experts to evaluate proposals).
- A similar suggestion - IFAD should consider setting up a system for matching demand and supply of technology, with TAGs listing their technological or methodological "offer" and loan projects listing their technological or methodological "demands."

To enhance dissemination of the outputs:

- All TAG proposals should include collaboration between research and extension oganizations, so that dissemination of outputs is facilitated.
- Consider joint venture projects between national programmes and the private sector (specifically mentioned in context of bio control).
- IFAD experience and research results should be more systematically preserved and shared globally among both research and development institutions. The IFAD Website was viewed by several as a useful tool for this.
- At the country level, there should be wider dissemination of outputs to not only extension organizations but also others which might be interested (e.g. NGOs, universities). One specific suggestion was to organize, every three years, a national (or regional) workshop on the impact and progress of all IFAD financed grant and loan projects in a given country. (This also relates to linkage improvement, above).

Box 18: Procedural Recommendations of IARCs to IFAD

Clearly the IARCs have had differing experience with IFAD administration of the grant programme: a few praised it as comparatively effective, efficient, and less bureaucratic than that of many other donor organizations, but the majority recommended streamlining procedures, and improving response and communication with TAG staff. Specific recommendations were:

- Speeding up and shortening of the time periods at each step: for proposal review, approval/rejection; for post-approval effectiveness of grants; for reviewing Progress Reports; for general response to queries.
- Clarification of exactly what IFAD wants and expects through broad guidance for Annual, Progress, and Completion reporting. A specific recommendations made was that each TAG Completion Report should list all the outputs.
- Devise effective means for bridging between grant projects.
- Specification for approved grants of the main contact person at IFAD, and for that person to respond to E-mail and other inquiries (apparently often not done), provide timely warnings on deadlines (not last minute).
- Update of the TAG project coordinator on possible areas of collaboration with IFAD loan projects.
- Provision of special earmarked funding for follow-up impact studies.

V. MAIN FINDINGS AND CONCLUSIONS

A. Overview

227. The AR&T Programme, IFAD's largest grant line, has now been operating for more than two decades. Between 1979 and December 2001, the Fund has approved 199 AR&T TAGs for agricultural research with a total value of USD 171.541 million. IFAD has taken the lead in opening up new research areas particularly for neglected crops of importance to the poor, influencing global policy for pro-poor agricultural research and many TAGs achieved some well documented successes. There have also been some less publicized failures. The majority of TAGs fall somewhere in between these two extremes. TAGs are usually well designed, and overall they have been reasonably effective in achieving stated objectives. Due to unavailability of impact assessment studies the impact of most TAGs on poverty cannot be rigorously established, but in those cases where technology outputs have been completed and can be assessed for poverty impact potential, many TAGs did not meet the minimal criteria.[112] TAGs impact on strengthening national research institutions appears to be highly positive.

228. Overall, the programme remains relevant to the IFAD poverty mandate, and to its current Strategic Framework. It has progressively focused on enabling the rural poor to access appropriate technology for improving their livelihood and on the technical and socio-economic needs of those living in ecologically fragile environments. Better use of farmer participatory research and multidisciplinary approaches has helped. But the Programme has also become increasingly diffuse in its focus. Early focus on crop research has given way to a much broader range and to a farming systems approach. Greater diversity has introduced new and downstream research. But it is also moving away from the core expertise of the CGIAR and non-CGIAR institutes being supported, and could be spreading IFAD's resources too thin. There has been considerable thinking in-house about research processes, but little attention to sectoral or thematic priorities, in line with IFAD's lending programme needs. In regional terms, the agricultural research Programme has achieved a better match with technology and research priorities and interests of PA, PI and PN than it has with either PF or PL.

229. The overall Programme impact is clearest at the institutional capacity building level, both at the IARC and NARS levels. Its poverty impact is least easily identified, in part because linkages with IFAD loan projects have usually not succeeded and because adequate impact evaluations are rarely available. Part of the problem also lies in the difficulties to attribute the poverty impact to TAGs when they are contributing to a larger research programme supported by IARCs. Impact on knowledge is weaker than it could and should be, and yet is probably the easiest to improve. The TANs are a good step in the right direction.

230. The Programme reach and efficiency need attention. The focus has been on distribution between CGIARs and non-CGIARs while distribution of grant resources between institutions within these two categories has become highly uneven. The same applies to regions and countries. Programme efficiency and Programme implementation leave room for improvement. This argues for a major policy and strategy exercise by IFAD, to focus the Programme thematically according to IFAD's Strategic Framework and regional research priorities, to enhance its efficiency and effectiveness.

B. Conclusions on Programme Policy, Strategy and Management

231. **The AR&T Programme still lacks a clear strategy, priorities and focus.** A series of positive moves in recent years have focused on making Programme procedures more systematic, transparent and

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[112] It should be acknowledged that lack of adequate information in reports may distort conclusion on the issue, but this can work both ways.

participatory. But there is still a lack of a common understanding within IFAD and between IFAD and its partners on the role and research priorities of the Programme. While grant approval processes have received considerable attention, the technical or research subject matter priorities have not. The present focus is too wide, and too diverse, in relation to the number of grants and institutions that can be supported, and for making best use of scarce resources. Basic issues, such as longer-term versus short-to-medium term research, and upstream versus downstream focus are still not quite clear, and become a matter of trend interpretation and/or case by case. Some regional divisions elaborated regional research strategies that guide their own TAGs selection but these are not positioned in a well defined institutional policy/strategy of support for agricultural research and will benefit from further focus and prioritization. What is needed is a ground-level policy and strategy discussion which determines what are IFAD research priorities given the New Strategic Framework, how can these be determined and linked to regional priorities and how can the programme address these effectively (see also recommendation 1 paragraph 246).

232. **Research needs better focus on innovative and replicable means for poverty reduction.** The Programme can and should play a more effective role in promoting replicable innovations for rural poverty alleviation. The Strategic Framework, the Evaluation of IFAD's Capacity as a Promoter of Replicable Innovations (2001) as well as the most recent External Review of IFAD (2002) recognized IFAD's potential to increase its global role in rural poverty reduction through a stronger and systematic emphasis on replicable innovations. Despite emphasis in all programme documents including the 1997 Guidelines on ***"the need to develop through applied and adaptive research innovative and effective means to eradicate rural poverty"*** the innovation dimension has not been a main criterion to assess grant proposals nor performance. There is a need for IFAD to carve a niche in generating innovative research agenda. The starting point should be the differentiated regional and local needs of the target groups. A good impetus in this direction has been the formulation of regional strategies for research. These strategies should acquire an operational and localized dimension with clear prioritization of areas needing innovations for research attention. TAGs should then be customized accordingly.

233. **Consistency between resource allocation in the AR&T Programme and that of the IFAD Loans needs to increase.** Ideally the allocation of resources in the AR&T programme should correspond to the expected (planned) allocation of resources in the Funds loan portfolio. This is important if grants are to address issues identified by operations and to link with future projects. To the evaluation knowledge no analysis has been done of the most recent change in resource allocation between various project types in IFAD. The evaluation investigated these recent trends on the basis of available classification in the PPMS. There seems to be a marked shift of allocation away from agricultural development, livestock and credit and in favour of investment in rural development in a broad sense. While fully recognizing the shortcoming of existing data and its aggregate nature, it is imperative that trends in resource allocation are carefully studied and predictions for the future are made given IFAD's Strategic Framework and the recent decision for its operationalization[113]. Synchronization between TAG programmes and Loan programmes (the former preceding the latter time wise) should subsequently be planned on the basis of regional and location specific identification of innovation needs.

234. **TAG management needs strengthening.** At present PD staff has difficulty coping with the Programme workload. There is no full-time coordinator and implementation task management is divided between various PT and regional staff. Notwithstanding IARCs praise to IFAD's staff professionalism and cooperation, the evaluation review of documents, institutional surveys and visits have all pointed that communication with grant applicants and recipients and supervision of TAGs can be improved. More time is also needed for knowledge management, including TAN processing, which is presently a major area of weakness. The programme workload could be reduced to some extent through more efficient procedures. The exact resources needed for the programme should be determined given the recommended sharper focus

[113] Operationalising the Strategic Framework, PD Retreat 2002. Rome, January 2002.

and directions. While an overall coordinator is always necessary, the Programme could be further decentralized with the division of available funds and decision making among all PD divisions, as is done under other IFAD grant lines. The Technical Division should always retain the overall quality control and knowledge management function in addition to management of TAGs it initiates. Some staff feel that this would be preferable to enhance linkages with IFAD projects.

235. **Programme procedures have improved, but are still not fully competitive or efficient**. The AR&T programme needs to be managed on a more competitive basis, encouraging bottom-up processes for identification of research priorities, and, above all, systematizing procedures for review, supervision, and information management. More specific conclusion and recommendations are discussed below. The present situation of grant processing results in proposals being "on hold" sometimes for as much as five years, and organizations waiting for a word from IFAD for months, even to acknowledge that a concept note has been received. IFAD partners are frequently in precarious financial position, which does not allow them to provide bridging funds for more than three months or so. Continual delays by IFAD can also undermine research or dissemination activities at the community level, with the poor disillusioned.

236. **Reporting should be more appropriate to IFAD concerns.** TAGs completion reports are not regularly prepared. Nor are they comparable in terms of topics covered and adequacy. Very rarely are problems and solutions discussed, and yet these are among the most informative parts of the report for IFAD, and also for future TANs. There is a tendency, as with the NGO/ECP, to produce self-laudatory documents or technical dissertations. Linkages to IFAD loan projects are usually also ignored in reports.

C. Conclusions on the Research Funded

237. **The Grant Programmes as a whole can be considered effective in achieving its main objectives, but its implementation has shown considerable variation in quality.** There are some very well conceived and executed TAGs and some poor ones. Overall, CGIAR institutes have performed better than non-CGIAR. Reports indicate marked differences in quality of proposals, performance and impact, with CGIAR implemented TAGs rating consistently higher. Some of the differences between TAGs could be due to differences in the capacity of grant recipients and collaborating NARS capacities for reporting, rather than for implementation. Albeit, capacity for implementation needs better assessment at the proposal stage, both to ensure that the minimal needed capacity exists. This also raises the issue of whether IFAD should give priority to the better performing IARCs, that is those with a good "track-record", which can put together an effective research team, to deliver quality output as per IFAD requirements and provide adequate reporting. IFAD should realize that there is a trade off between financing research with established CGIARs with high capacity, and supporting smaller non-CGIARs institutions closer to the rural poor but with lower capacity that requires investment in building it up.

238. **The Programme has made a considerable contribution to capacity building, particularly in participatory methodologies and poverty-oriented research at the national level, but trade-offs should be considered.** In spite of valuable efforts made to help NARS, there are a number of constraints to longer-term impact of such efforts, which have to do with the generally weak financial and political situation of NARS, staff attrition and staff rotation. Where a choice is possible, working with stronger NARS, and stronger and well-financed NGOs, is preferable in terms of achieving outputs. Therefore, as in the case of IARCs (above), IFAD needs to recognize the trade-off and decide which is more important. If capacity building is to be a major objective of the programme, then adequate time and funding should be allowed for this purpose under the TAGs and loan projects should also play a part, since this is supposed to be their level of focus. It could be argued that if governments are not willing to use loan funds for the purpose of enhancing their weak agricultural research systems, grants would be ultimately wasted. If quality of output is the overriding goal, then the Programme needs to recognize that agricultural research

will have to be highly selective in terms of national partners, and it may not always be NARS, but also other institutions, e.g. NGOs, who may well be a better choice, particularly for downstream research.

239. **There has been a general trend in the programme towards more multidisciplinary and participatory research, but economic and policy analysis need strengthening.** CGIAR and some non-CGIARs are gradually developing capacities in multidisciplinary and participatory research under IFAD's and other donors influence. Although social aspects are becoming increasingly well integrated even in setting institutional research agenda, economic and policy issues still need more attention. Cost-benefit analysis seems to be missing in the design of many TAGs, and up-front policy constraint analysis and policy dialogue on promising new issues should be given more attention.

240. **Some TAG projects are moving beyond technology validation to support for technology dissemination activities.** While in some ways, this is desirable, it also raises a number of institutional issues. At IFAD level, there is the danger of overlap between AR&T focus and activities and those of the NGO/ECP and the coverage of the Loan programme. At the level of IARCs, there is the question of value added and the match between such activities and the skills of grant recipients, particularly the CGIARs. In some instances, the CGIARs staff confine themselves to the international management of research activities, leaving the highly localized field research to the NARS, which in most regions and countries, are understaffed, under-funded and generally ineffective. In some others, CGIAR staff are increasingly involved in local level management of validation and dissemination activities replacing perhaps work that should have been done by local institutions and staff. In yet other cases IARCs are sub-contracting the research to universities and NGOs. From a developmental perspective some of these downstream activities can perhaps be more effectively and efficiently undertaken within IFAD loans, either from loan proceeds or by using what is known as components related grants.

241. **There is a danger of research achievements and impact being undermined by the narrow time frame of TAGs.** Extensions, funding of subsequent phases and sometimes small grants are used to 'patch up' grant projects in order to allow them to achieve their objectives. This approach is inefficient, and is advantageous to neither the grantees or to IFAD. Apart from capacity constraints, it suggests that the research activities, and particularly the newer impact-oriented ones, need a longer implementation period than the usual three years. Both review of reports and institutional surveys with IARCs argue that a longer time frame of four to five years would result in better research and better learning from research. It would allow adequate time for capacity building, understanding of the research clients, and for a realistic assessment of impact, a year or so after activities phase out.

242. **Synergistic linkages between TAGs and IFAD loan projects have been difficult to achieve.** This is perhaps one of the most important shortcomings of the Programme, and one that greatly obscured its impact on rural poverty. Frequent causal factors are lack of appropriate knowledge on the needs of IFAD projects, limited time, lack of appropriate time sequencing between grants and loan projects, and delays in grants implementation. IARCs also complained about lack of information flow from IFAD on technology needs of ongoing projects and future project pipeline. Past experience has provided some useful lessons on how to better achieve linkages, and there are some good models among the TAGs. More could be done at the TAG proposal and start-up stages to lay a better basis for linkages, particularly by IFAD/Rome staff, through providing the basic needed information on "what is where." Organized visits by staff of IARCs to selected IFAD projects with potential needs can also be useful. Supervision and reporting have both failed in paying adequate attention to the question. There is some indication that where regions (that is, CPMs) manage TAGs, such linkages are more effective.

D. Conclusions on Resource Allocation Issues

243. **TAG budgets need more review attention**. There appears to be weak review of the "approved" proposals, particularly of the budget allocation, prior to submission to the EB. FC complains of inadequate time allowed for the purpose. There should be attention to the question earlier on as well. The evaluation found considerable and unnecessary inconsistency in the budget line items used by TAGs. Also, whereas a few budgets for proposals are detailed, some are so general and ambiguous. A separate earmarking of funds for M&E is also needed if IFAD continues to be interested in impact evaluation of TAGs. Otherwise, a danger exists that it will either not be done, or will be underfunded and done poorly.

244. **A few financial issues require clarification.** Overheads rates have varied tremendously over the years, but have now reportedly been stabilized at 13.5% since 2000. But even this is not agreed on, and the evaluation has received four or so differing opinions on the current rule. An analysis of the budgets reveals ways of getting around this, for instance, through including all the overhead costs in the budget and then charging overhead on the total (that is, double counting for overhead). Inclusion of costs of supervision under the TAG is another issue. Several newer TAGs have done this. It is viewed as unethical or a conflict of interest by some IFAD staff, and advantageous by others, given the Fund's financial constraints.

245. **TAG budgets need to always specify funding to be directly allocated to NARS**. This is not always done. The allocation of resources to NARS is also often very small - for example as little as USD 2 000 per country. This may not provide sufficient incentive for good performance, even when field research costs are fairly low.

VI. RECOMMENDATIONS

1. Provision of Clear Strategic Guidance

246. **A policy/strategy paper should be prepared for the Programme.** As noted, consultations with IFAD operational regions, review of documents and reports, and the evaluation institution's survey have highlighted a widely divergent perceptions of role and priorities of the Programme. Some grant recipient institutions are also confused. The present 1997 *Guidelines* are not sufficiently clear, and in places are confusing, in part because of dealing simultaneously with both research grants policy and procedures. For the future success of the programme it is essential that IFAD develops a clear policy and strategy for the programme, which addresses some key issues, including:

(i) clear, non ambiguous, statement on the goal and objectives of the Programme;
(ii) definition of focused research areas for IFAD support, based on the Strategic Framework and linking these with specific and focused regional priorities, as defined by each region, within a defined medium-term horizon (e.g. five years);
(iii) clarification of IFAD policies in terms of longer-term commitment versus short-term support and upstream versus downstream research (that is, whether the programme should deal exclusively with the latter or not);
(iv) re-review of the range and types of organizations that should have direct access to available grant funds (including the traditional CGIAR non-CGIAR division) and whether a main role of the Programme is to develop capacity or to build on existing capacity and reward good performance;
(v) clarification of the role of the AR&T Grants in promoting replicable innovations and the importance of appropriate synchronization with the Loan Programme;
(vi) decision on the relative importance to be given to agricultural research for technology development or to studies on technology transfer, as compared to social and policy research (e.g. on property rights, regional policies, grassroots organizational structures and processes);

(vii) specification of a clear policy on repeat phases, including identification of exactly how a phase is to be defined;
(viii) adequate allowance of grant time period, to allow for meaningful impact to emerge and reduce the necessity for repeat phasing;
(ix) definition of the relationship between grant funded research and loan funded research, and how and with what instruments support to NARES should be addressed;
(x) definition of the broad spectrum of partnership in setting research priorities, contributing to research output, and the process of their inclusion, which should cover IARCs, NARES, NGOs, CBOs, farmers and others;
(xi) identification of complimentarity and linkages of the AR&T grants with other IFAD grant lines (particularly NGO/ECP and small grants); and
(xii) specification of IFAD policy of linkages between AR&T technology output and ongoing and future IFAD projects.

2. Improvements of Programme Procedures

247. **Procedures for review, selection, supervision and impact assessment of TAGs need further strengthening.** There has been notable improvement in this area in recent years, but much still remains to be done to:

(i) tighten and improve review and selection procedures to enhance transparency and ensure fair competition among applicants;
(ii) ensure that addressing innovation needs is included as a criterion to assess proposals;
(iii) increase efficiency and speed of application processing and in response to queries from IARCs;
(iv) provide adequate information and guidance to grant applicants and grant recipients;
(v) conduct better review of the completed proposals, particularly of institutional arrangements and capacity and of the budget;
(vi) ensure systematic and useful supervision of all projects funded;
(vii) promote reporting coverage of all key issues, including non-technical ones, such as linkages with IFAD loan projects, participatory processes, gender issues and constraints and problems encountered;
(viii) promote extraction of lessons through adequately funded and timed impact evaluation; and
(ix) provide clearer guidelines for IARCs for grants processing, reporting and most importantly impact assessment.

3. Attention to Financial and Human Resources

248. **Both Programme human and financial resources need to be used more efficiently and effectively.** There are unnecessary delays at all stages and frequently poor communication between IFAD and grant applicants or recipients. Resources are also not consistently allocated in grant budgets. In order for the programme to be more efficient and effective:

(i) the resources required for the programme should be determined in the framework of the required sharper focus in programme coverage suggested by this evaluation and the recommended policy/strategy paper. Staff requirements particularly for quality control and management should be determined accordingly;
(ii) the regions need to assume a larger role in managing TAG implementation, in order to ensure better grant-loan project linkages and reduce supervision costs;
(iii) adequate resources should be allocated for supervision purposes, preferably to be done by a designated small team of consultants for all TAGs, who understand the programme and its goals and have the necessary expertise (except where CPMs manage and supervise). There should also

be a firm policy on whether funds for the purpose of supervision should or should not be included under grants; and
(iv) funds for impact evaluation should be earmarked in the budgets of all grants funded.

4. Strengthening of Learning from AR&T Programme

249. **Learning from the AR&T Programme needs immediate attention**. The AR&T Programme has substantial untapped learning potential. As in other areas, knowledge management has improved but not enough. There is no indication that most of the information being generated by AR&T research TAGs is being captured and disseminated.

(i) The TANs are a good positive step in the right direction and well received by the IARCs, but the pipeline blockage needs attention, as does fine-tuning of notes to make them more useful to institutions and projects that might want to consider the technology.
(ii) A system needs to be set up to capture and share the many *non-technical* but useful lessons being generated on topics such as institutional partnerships, participatory processes, transferability, sustainability and adoption of technology and methodologies such as impact monitoring and evaluation.

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Swindale, L.D.	Globalization of Agricultural Research: A Case Study of the Control of the Cassava Mealybug in Africa
Walker, T. and Chrissman C.	1996. Case Studies of Economic Impact of CIP-related Technology. p. 2
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World Bank	1997 World development report, 1997. The state in the changing world. Oxford University Press, New York, USA. 265 pp.
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Evaluation of
IFAD's Technical Assistance Grants Programme
for Agricultural Research

Corporate-level Evaluation Report

APPENDICES

APPENDIX 1

INFORMATION ON THE

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH (CGIAR)

I. BACKGROUND

1. The CGIAR was founded in May 1971, when its first formal meeting was held at the World Bank. Eighteen governments and organizations attended as members; ten as observers. None of them were from developing countries, however. The founding meeting:

- Adopted a resolution setting out the **Objectives, Composition and Organizational Structure** of the CGIAR;
- Decided to support the four existing international centres established by the Ford and Rockefeller Foundations;
- Established a **Technical Advisory Committee** to provide the CGIAR with independent scientific advice;
- Invited FAO to arrange a rotational system for a maximum of five governments to represent developing regions/countries on the CGIAR for two years at a time; and
- Received pledges of financial support from founding members.

2. Since then, **membership** of the Group has increased from eighteen to fifty-eight, the number of **CGIAR centres** has grown to sixteen, and their research interests have been diversified.

3. The CGIAR is an informal association of fifty-eight members that supports agricultural research and related activities of an international public goods nature carried out by sixteen autonomous research centres. Individual members support centres and programs of their choice, and each centre directly receives and spends funds and provides accountability through their externally audited financial statements.

4. The CGIAR is financed by members' contributions. Members of the CGIAR include industrial and developing countries, foundations, and international and regional organizations. In 2000, **contributions from CGIAR members amounted to USD331 million and Centres generated another USD14 million in income.** Industrial countries, specifically the members of the Development Assistance Committee of the Organization for Economic Cooperation and Development, account for more than two-thirds of CGIAR financing. In 2000, 55 members contributed to the CGIAR research agenda. The fifty-five contributing members can be placed into four distinct groups: industrial countries (21), developing countries (19), foundations (3), and international and regional organizations (12).

5. **The research agenda** comprises the bulk of CGIAR centre projects and activities. Components may be executed by one or more centres and/or jointly with national agricultural research systems, advanced research institutions, and non-governmental organizations. Centres develop the agenda and work programs in collaboration with partners. The CGIAR's Technical Advisory Committee reviews the agenda and, if appropriate, recommends it for CGIAR financing. Projects included in the agenda must meet four criteria. They must:

- aim at producing research or research-related (including training) international public goods;
- be of high priority in terms of accomplishing the CGIAR's goals and objectives;
- have acceptable probabilities of success;
- and not have alternative producers or sources of supply with suitable costs or reliability.

A. CGIAR Objectives

- on the basis of a review of existing national, regional and international research activities, to examine the needs of developing countries for special effort in agricultural research at the international and regional levels in critical subject sectors unlikely otherwise to be adequately covered by existing research facilities, and to consider how these needs could be met;
- to attempt to ensure maximum complementarity of international and regional efforts with national efforts in financing and undertaking agricultural research in the future and to encourage full exchange of information among national, regional and international agricultural research centres;
- to review the financial and other requirements of those international and regional research activities which the Group considers of high priority, and to consider the provision of finance for those activities, taking into account the need to ensure continuity of research over a substantial period;
- to undertake a continuing review of priorities and research networks related to the needs of developing countries, to enable the Group to adjust its support policies to changing needs, and to achieve economy of effort; and
- to suggest feasibility studies of specific proposals to reach mutual agreement on how these studies should be undertaken and financed, and to exchange information on the results.
- In all of the deliberations of the Consultative Group and the Technical Advisory Committee, account will be taken not only of technical, but also of ecological, economic and social factors.

B. Technical Advisory Committee

6. The TAC is composed of distinguished international experts form developed and developing countries, nominated by the co-sponsors and appointed by the Group. The TAC will be supplemented by advisers with special expertise, who may be invited to serve individually or on panels to consider particular problems. **Functions:**

- advise the Consultative Group on the main gaps and priorities in agricultural research related to the problems of the developing countries, both in the technical and socio-economic fields, based on a continuing review of existing national, regional and international research activities;
- recommend to the Consultative Group feasibility studies designed to explore in depth how best to organize and conduct agricultural research on priority problems, particularly those calling for international or regional effort;
- examine the results of these or other feasibility studies and present its views and recommendations for action for the guidance of the Consultative Group;
- advise the Consultative Group on the effectiveness of specific existing international research programs; and in other ways encourage the creation of an international network of research institutions and the effective interchange of information among them.

II. HISTORY DEVELOPMENT OF THE CGIAR

A. The First Decade (1971-1980)

7. The founding objective of CGIAR was to "increase the pile of rice" – in reality, food – in tropical countries that faced serious scarcity. Highest priority was given to research on cereals. Soon, however, the research portfolio was broadened from rice, wheat, maize, cassava, and pastures to include such commodities as chickpea, sorghum, potato, millets and, eventually, to a list of 27 commodities. The emphasis was broaden to "increasing the pile of food" tasking into account "not only of technical, but also of ecological, economic and social factors." (founding resolution)

8. The same resolution urged that national and international research centres should work together. In keeping with these sentiments, the CGIAR branched out into several new areas of activity such as livestock research, farming systems, conservation of genetic resources, plant nutrition, water management, policy research, and services to national agricultural research centres in developing countries.

B. The Second Decade (1981 – 1990)

9. The objective of research was defined as increasing ***sustainable*** food production in the developing countries in such a way that the nutritional level and general economic well-being of the poor are improved. This approach implied a move towards a poverty focus, as well as heavier emphasis on protecting bio-diversity, land, and water.

Four major program thrusts were identified:

- Enhancing sustainability through resource conservation and management;
- Increasing the productivity of commodity production systems;
- Improving the policy environment; and
- Strengthening national research capabilities.

10. Centres were encouraged to use multidisciplinary approaches, to increase inter-centre cooperation, to support national research systems, and to collaborate with others in an emerging global agricultural research system.

C. The Third Decade (1991- 1999)

11. The CGIAR extended its research focus to include agroforestry, forestry, fisheries, water management and banana/plantain. The CGIAR **mission statement** was reformulated to read as follows :

> *Through international research and related activities, and in partnership with national research systems, to contribute to sustainable improvements in the productivity of agriculture, forestry and fisheries in developing countries in ways that enhance nutrition and well-being, especially of low-income people.*

12. Growing uncertainties arose that affected the vision, programs, and governance of the CGIAR system. Oversight and Finance Committees were set up, and new ways of increasing financial support were explored, but uncertainty spilled over into crisis, when a drop in support from four major donors, due to domestic reasons, curtailed the budget and hampered implementation of research programs. The possibility of "restructuring" the CGIAR system – in effect, reducing the number of centres – was considered. In May 1994, the CGIAR endorsed a proposal to undertake an eight-month renewal program to overcome the crisis, and restore the CGIAR to full vigour. Its objectives would be to "clarify the vision of the CGIAR, refocus its research agenda, create greater openness and transparency, strengthen its partnerships, ensure its efficiency and effectiveness, and tighten its governance and operations."

13. The high-point of the renewal program was a Ministerial-level Meeting held in Lucerne (February 1995). This was the most significant and highest-level gathering of the CGIAR since the pre-founding meetings in Bellagio.

- The Lucerne Meeting reaffirmed the critical importance of agriculture as both a catalyst and an integral part of development, with agricultural research serving as an indispensable component of agricultural development.
- The CGIAR was recognized as a vital contributor to international development efforts, because of its proven research capacity and its effective approaches to developing sustainable agriculture.

- The meeting adopted a Declaration and Action Plan that would enable the CGIAR to serve the world's poor and disadvantaged, and help protect the environment, well into the future.
- Thirty-nine delegations were represented at Lucerne – eighteen from industrialized countries, eight from developing countries, and thirteen from foundations, international, and regional organizations.
- Fourteen delegations were led by ministers and heads of agencies, and fifteen by deputy ministers and deputy heads of agencies.
- The viewpoint of the South was a strong influence at the meeting. Cote d'Ivoire, Egypt, Iran, and Kenya were welcomed as new CGIAR members. Other Southern members participating were Colombia, India, Indonesia, and the Philippines.
- UNEP was invited to join the cosponsors' group of the CGIAR, and accepted the invitation.

Almost every aspect of the CGIAR was affected by the renewal program:

Revised Mission Statement:

To contribute, through its research, to promoting sustainable agriculture for food security in the developing countries.

New membership composition:

14. Ten Southern countries joined the CGIAR during and after the renewal program. Twenty CGIAR members are from the South, up from zero in 1971, and twenty-one are from the North.

Research Programs:

15. The CGIAR has transformed its programs from the founding objective of growing more food to a more complex and demanding approach. Productivity and natural resource management are the twin pillars of research on aquatic resources, conservation of genetic resources (bio-diversity), food crops, forestry/agroforestry, livestock, soil and water nutrients, water management, and policy research; and in its endeavours to strengthen scientific capacity in developing countries.

- Poverty reduction is the guiding impulse of CGIAR-supported research. The CGIAR conducts impact assessment to ensure that the research it supports contributes to fighting poverty.
- Soil and water management, forestry/agroforestry; and the application of research directed at reducing the use of chemicals in agriculture are key priorities in efforts to nurture the environment.
- Biodiversity remains a major concern of the CGIAR which holds in trust for the future one of the world's largest ex situ collections of plant genetic resources, containing over 600,000 accessions of more than 3,000 crop, forage, and pasture species. Duplicates of these materials are freely available to researchers around the world so that new gene combinations can be used to increase productivity, sustainably.
- Biotechnology will be mobilized through research alliances to ensure that it can contribute to more sustainable agricultural growth in developing countries, with special care devoted to issues such as ethics, safety, and the access of developing countries to biotechnology products.

Partnerships:

16. Scientific excellence was originally centre-focused, but is now **partnership oriented.** A culture of partnership has spread across the CGIAR system. A Global Forum links the CGIAR with partners in the global agricultural research system. The CGIAR has established partnership committees with the NGO community and the private sector.

Governance:

17. Governance mechanisms have been strengthened, and decision making has been streamlined, to ensure dynamism and a greater sense of participation by stakeholders.

Finance:

18. A matrix approach has been adopted to ensure transparency. Funding for high priority CGIAR research has expanded from the pre-renewal low of USD220-USD240 million to an estimated **USD335-340 million for 1998.**

19. Following the **third review of the CGIAR system** in 1997/1998, it was concluded that "investment in the CGIAR has been the single most effective use of official development assistance (ODA). There can be no long-term agenda for eradicating poverty, ending hunger, and ensuring sustainable food security without the CGIAR." The review proposed the following **major action points:**

- A global initiative for integrated gene management that will conserve genetic resources (biodiversity) and use them sustainably, in keeping with the equity and biosafety provisions of the Convention on Biological Diversity.
- An international coordinating and servicing unit for biosafety, bioethics, and biosurveillance, that will make it possible for the latest developments in biotechnology to be applied in ways that are pro-poor and pro-environment.
- The creation of "rules of engagement" under which the public and private sectors can cooperate, so that poor farmers and smallholders in developing countries will not be cut off from access to new crop technologies.
- New research initiatives by national and international scientists for the environmentally sound management of natural resources.
- Global agricultural knowledge networks that will provide both traditional and contemporary scientific knowledge as free goods to farmers, scientists, NGOs and others in developing countries.
- Research support to Africa's initiative for the development of a millennium strategy for African agriculture.
- Political and financial commitment to agricultural development by all parties (governments, international organizations, national research organizations, the civil society, the private sector).

20. Following the review, the mission of the CGIAR was again redefined.
The **new mission statement emphasizing food security and poverty eradication** reads as follows:

To contribute to food security and poverty eradication in developing countries through research, partnership, capacity building, and policy support, promoting sustainable agricultural development based on the environmentally sound management of natural resources.

III. CGIAR MEMBERS

- 1971: Belgium, Canada, Denmark, France, Germany, Netherlands, Norway, Sweden, Switzerland, United Kingdom, United States, Asian Development Bank, Inter-American Development Bank, International Development Research Centre – IDRC, UNDP, World Bank, Ford Foundation, W.K. Kellogg Foundation, Rockefeller Foundation.

- 1972: Australia, Japan
- 1975: Italy, Nigeria, Saudi Arabia
- 1976: New Zealand

- 1977: Arab Fund for Economic and Social Development
- Commission of the European Communities
- 1978: African Development Bank
- 1979: Ireland, International Fund for Agricultural Development (IFAD)
- 1980: Mexico, Philippines, Opec Fund for International Development
- 1984: Brazil, China, Finland
- 1985: Austria
- 1991: Luxembourg, Korea
- 1993: Indonesia
- 1994: Russian Federation, Colombia
- 1995: Bangladesh, Egypt, Iran, Kenya, Romania, Syria
- 1996: Cote d'Ivoire
- 1997: Pakistan, Republic of South Africa, Portugal, Peru, Thailand
- 1998: Uganda

IV. CGIAR CENTERS

Original members of the system, founded before the CGIAR:
- IRRI: Los Banos, Philippines
- CIMMYT: Mexico City, Mexico
- IITA: Ibadan, Nigeria
- CIAT: Cali, Colombia

Founded or adopted by the CGIAR, to broaden the system, after 1971:
- ICRISAT: Hyderabad, India
- CIP: Lima, Peru
- ILRAD: Nairobi, Kenya
- ILCA: Addis Ababa, Ethiopia
- IPGRI: Rome, Italy
- WARDA: Bouake, Cote d'Ivoire
- ICARDA: Aleppo, Syria
- ISNAR: The Hague, Netherlands
- IFPRI: Washington D.C.

Founded or adopted by the CGIAR to strengthen its mission, after 1990:
- ICRAF: Nairobi, Kenya
- IIMI: Colombo, Sri Lanka
- ICLARM: Penang, Malaysia
- INIBAP: Montpellier, France
- CIFOR: Bogor, Indonesia

Mergers and other changes:

1994: ILCA and ILRAD merge and become the International Livestock Research Institute (ILRI).
1994 : INIBAP becomes a programme of the International Plant Genetic Resources Institute (IPGRI)

APPENDIX 2

LIST OF GRANT RECIPIENT ORGANIZATIONS

Acronym	*Full name*	*Location of main office*
CGIAR		
CIAT	International Centre of Tropical Agriculture	Cali', Colombia
CIFOR	Centre for International Forestry Research	Jakarta, Indonesia
CIMMYT	International Centre for the Improvement of Maize and Wheat	Mexico City, Mexico
CIP	International Potato Centre	Lima, Peru
ICARDA	International Centre for Agricultural Research in the Dry Areas	Aleppo, Syria
ICLARM*	International Centre for Living Aquatic Resources Management	Dhaka, Bangladesh
ICRAF*	International Centre for Research in Agroforestry	Nairobi, Kenya
ICRISAT	International Crops Research Institute for semi-Arid Tropics	Andhra Pradesh, India
IFPRI	International Food Policy Research Institute	Washington D.C., USA
IIMI*	International Irrigation Management Institute	Colombo, Sri Lanka
IITA	International Institute of Tropical Agriculture	Ibadan, Nigeria
ILCA**	International Livestock Centre for Africa	
ILRI	International Livestock Research Institute	Nairobi, Kenya
IPGRI	International Plant Genetic Resources Institute	Rome, Italy
IRRI	International Rice Research Institute	Los Banos, The Philippines
ISNAR	Inetrantional Services for National Agricultural Research	The Hague, The Netherlands
WARDA	West Africa Rice Development Association	Bouake', Cote D'Ivoire
Non-CGIAR		
ACSAD	The Arab Centre for the Studies of Arid Zones and Dry Areas	Damascus, Syria
AOAD	The Arab Oranization for Agricultural Development	Khartum, The Sudan
CARDI	The Caribbean Agricultural Research and Development Institute	Belmopan, Belize
CATIE	The Tropical Agricultural Research and Training Centre	Turrialba, Costa Rica
CEDARE	Centre for Environment and Development for the Arab World and Europe	Giza, Egypt
CIHEAM	International Centre for Advanced Mediterranean Agronomic Studies	Bari, Italy
DLCO	Desert Locust Control Organization	Adis Abeba, Ethiopia
FAO	Food and Agriculture Organization	Rome, Italy
ICIPE	The International Centre of Insect Physiology and Ecology	Nairobi, Kenya
IDRC	The International Development Research Centre	Ottawa, Canada
IFDC	The International Fertilizer Development Centre	Alabama, USA
IICA	Interamerican Institute for Agricultural Cooperation	San Jose', Costa Rica
IJO	International Jute Organization	Dhaka, Bangladesh
INBAR	International Network for Bamboo and Rattan	Beijing, China
INFOSAMAK	Centre for Marketing Information and Advisory Services for Fishery Products in the Arab World	Bahrain
OAU/STRC	The Scientific, Technical and Research Committee of the Organization of African Unity	Ouagadougou, Burkina Faso
RADHORT	African Network for the Development of Horticulture	Dakar, Senegal
SSO	Sahara and Sahel Observatory	Tunis, Tunisia
UNIDO	United Nations Organization for Industrial Development	Vienna, Austria

* organizations that changed status from non-CGIAR to CGIAR. Recently IIMI changed name to IWMI.

** this centre does not exist anymore and has merged with ILRI.

APPENDIX 3

TAGs PROGRAMMES REVIEWED BY THE EVALUATION

Region	TAG No.	Programme Name	Year of Approval	Recipient Institution	Total Grant Amount (million USD)
NENA	1	Applied research on broadbeans in the Nile Valley	1979	ICARDA	8.320
Africa	36	Biological control of the cassava mealybug and the green mite	1980	IITA	0.781
Africa	40	Research on Arid Zones Livestock Systems	1980	ILRI (ILCA)	3.860
Africa	72	Research on Plantain Production in Africa	1981	IITA	1.610
Africa	120	Nutritional Effects of Cash Cropping	1984	IFPRI	0.700
Africa	136	Biological Control of Cassava Pests	1985	IITA	2.100
Asia/Pacific	148	Agricultural Research on Rainfed Rice Production	1986	IRRI	1.342
Asia/Pacific	167	Research programme on the impact of fish culture within the farming system	1987	ICLARM	0.200
Asia/Pacific	167a	Research programme on the socio-economic impact of fish culture extension on the farming systems in Bangladesh – phase II	1994	ICLARM	0.401
Asia/Pacific	181	On-farm research on groundnut, pigeonpea, chickpea and transfer of technology to Semi-Arid Tropics (SAT) farmers of India	1988	ICRISAT	1.068
Africa	183	Agroforestry Research for the Development of the Drylands of West Africa	1988	ICRAF	1.500
Africa	183a	Agroforestry Research for the Development of the Drylands of West Africa	1992	ICRAF	1.000
LAC	192	Adaptive research on sheep production systems for the small farm sector in the Caribbean	1989	CARDI	0.430
NENA	216	Camel Applied Research Network Programme	1991	ACSAD	1.500
LAC	256	Regional programme for the development of South American camelids	1993	IICA	0.800
LAC	256a	Regional programme for the development of South American camelids- Phase II	1996	IICA	0.500
Asia/Pacific	257	International Network for Bamboo and Rattan (INBAR) research and development programme	1993	CIFOR	0.700
Asia/Pacific	263	Collaborative research and development of sustainable rice farming systems in Southern Asia – phase II	1993	IRRI	1.380
NENA	264	Research programme for the development of sustainable crop/livestock production technologies in the low rainfall areas	1993	ICARDA	1.200
Africa	284	Programme for an integrated approach to trypanosomiasis control technologies and assessment of its impact on agricultural production, human welfare and natural resources in Tse tse-affected areas of Africa	1994	ILRI (ILCA)	0.800
Global	301	Programme for strengthening the household food security and nutritional aspects of IFAD poverty alleviation projects: developing operational methodologies for project design and monitoring	1995	IFPRI	0.948
NENA	306	West Asia and North Africa Dryland Durum Wheat Improvement Network (WANADDIN) Programme (ICARDA/CIMMYT Joint Programme)	1995	ICARDA	1.300
Africa	307	Research on accelerated diffusion of rice technology (RADORT) programme in West Africa	1995	WARDA	0.750

Africa	308	Development of sericulture and apiculture technologies for enhancing the income generation potential of smallholders in Africa	1995	ICIPE	1.300
NENA	309	Programme for the establishment of a Regional Animal Disease Surveillance and Control Network (RADISCON) in North Africa, the Middle East, and the Arab Peninsula	1995	FAO	1.250
Global	318	Enhancement of income-generation potential through the development and transfer of improved cassava genetic material and adoption of post-harvest technologies in Latin America and Africa	1996	CIAT	0.950
LAC	320	Programme for adaptive research on environmentally sustainable strategies for the control of the tropical bont tick (amblyomma variegatum) from the Caribbean	1996	FAO	1.000
Asia/Pacific	330	Development of an integrated pest management (IPM) programme for the management of pulse pests in Southern Asia	1996	ICRISAT	0.500
Asia/Pacific	332	Development and transfer of technologies for smallholder bamboo and rattan-based producers from Asia to Africa	1996	IDRC	0.900
Asia/Pacific	361	Programme for the sustainable use of coconut genetic resources to enhance the incomes and nutrition of coconut smallholders in the Asia and Pacific region	1997	IPGRI	0.907
NENA	362	Participatory rainfed agricultural technology development and transfer to farmers in the semi-arid areas of the Near East and North Africa	1997	ACSAD	0.660
Asia/Pacific	363	Adaptive research on improved varieties of jute and allied fibres and their utilization for enhanced income-generation	1997	IJO	0.400
NENA	364	Programme for the development of a regional strategy for the utilization of the Nubian sandstone aquifer system (NSAS)	1997	CEDARE	0.700
Africa	375	Programme for developing and disseminating stress-tolerant maize for sustainable food security in East, West and Central Africa	1997	CIMMYT/ IITA	1.000
Africa	386	Programme for participatory development of environmentally-friendly pest management options towards sustainable vegetable cultivation by smallholders in Sub-Saharan Africa	1997	ICIPE	0.600
Global	408/408a/544[114]	Research Partnerships and Rural Poverty Alleviation	2001	GFAR	0.3
Global	411	Integrated management of potato late blight disease: refining and implementing local strategies through farmers' field schools	1998	CIP	1.050
Africa	457	Poverty alleviation and enhanced food availability in West Africa through improved yam technologies	1999	IITA	1.250
NENA	485	Sustainable management of natural resources and improvement of major production systems of the Arabian peninsula – Phase II	2000	ICARDA	0.920
Africa	488	Participatory adaptive research and dissemination of rice technologies in West Africa	2000	WARDA	1.000
Asia/Pacific	531	Community-based fisheries management (CBFM) programme in south and southeast Asia	2001	ICLARM	0.650
Africa	543	Evaluating the Impact of Research Partnerships	2001	ENDA	0.1
Total		42 grants[115]			48.627

[114] Please note that this TAG and TAG 543 are both considered "small" TAGs.
[115] This figure refers to the number of *programmes* reviewed, where one programme can be made up of more than one grant (for e.g. TAG 1 which is composed of 9 single grants). In total, 67 grants were taken into consideration for the review.

APPENDIX 4

INDIVIDUAL TAGs REVIEWED BY THE EVALUATION

No	Region	TAG No	Programme Name	Year of Approval	Recipient Institution	Total Grant Amount (million USD)	Closed/ Effective
1	NENA	1	Applied research on broadbeans in the Nile Valley	1979	ICARDA	1.14	C
2	NENA	1a	Applied research on broadbeans in the Nile Valley	1980	ICARDA	0.96	C
3	NENA	1b	Applied research on broadbeans in the Nile Valley	1981	ICARDA	0.92	C
4	NENA	1c	Applied research on broadbeans in the Nile Valley	1982	ICARDA	1.30	C
5	NENA	1d	Applied research on broadbeans in the Nile Valley	1983	ICARDA	1.50	C
6	NENA	1e	Applied research on broadbeans in the Nile Valley	1984	ICARDA	1.50	C
7	NENA	1f	Applied research on broadbeans in the Nile Valley	1986	ICARDA	0.60	C
8	NENA	1g	Applied research on broadbeans in the Nile Valley	1987	ICARDA	0.30	C
9	NENA	1h	Applied research on broadbeans in the Nile Valley	1988	ICARDA	0.10	C
10	Africa	36	Biological control of the cassava mealybug and the green mite	1980	IITA	0.281	C
11	Africa	36a	Biological control of the cassava mealybug and the green mite	1982	IITA	0.500	C
12	Africa	40	Research on Arid Zones Livestock Systems	1980	ILRI (ILCA)	0.46	C
13	Africa	40a	Research on Arid Zones Livestock Systems	1981	ILRI (ILCA)	0.65	C
14	Africa	40b	Research on Arid Zones Livestock Systems	1982	ILRI (ILCA)	0.60	C
15	Africa	40c	Research on Arid Zones Livestock Systems	1983	ILRI (ILCA)	0.60	C
16	Africa	40d	Research on Arid Zones Livestock Systems	1984	ILRI (ILCA)	0.50	C
17	Africa	40e	Research on Arid Zones Livestock Systems	1985	ILRI (ILCA)	0.50	C
18	Africa	40f	Research on Arid Zones Livestock Systems	1988	ILRI (ILCA)	0.55	C
19	Africa	72	Research on Plantain Production in Africa	1981	IITA	0.21	C
20	Africa	72a	Research on Plantain Production in Africa	1982	IITA	0.30	C
21	Africa	72b	Research on Plantain Production in Africa	1983	IITA	0.35	C
22	Africa	72c	Research on Plantain Production in Africa	1984	IITA	0.30	C
23	Africa	72d	Research on Plantain Production in Africa	1985	IITA	0.25	C
24	Africa	72e	Research on Plantain Production in Africa	1986	IITA	0.2	C
25	Africa	120	Nutritional Effects of Cash Cropping	1984	IFPRI	0.200	C
26	Africa	120a	Nutritional Effects of Cash Cropping	1985	IFPRI	0.250	C
27	Africa	120b	Nutritional Effects of Cash Cropping	1986	IFPRI	0.250	C
28	Africa	136	Biological Control of Cassava Pests	1985	IITA	0.50	C
29	Africa	136a	Biological Control of Cassava Pests	1986	IITA	0.50	C
30	Africa	136b	Biological Control of Cassava Pests	1987	IITA	0.50	C

31	Africa	136c	Biological Control of Cassava Pests	1988	IITA	0.60	C
32	Asia/Pacific	148	Agricultural Research on Rainfed Rice Production	1986	IRRI	1.342	C
33	Asia/Pacific	167	Research programme on the impact of fish culture within the farming system	1987	ICLARM	0.200	C
34	Asia/Pacific	167a	Research programme on the socio-economic impact of fish culture extension on the farming systems in Bangladesh - phase II	1994	ICLARM	0.401	C
35	Asia/Pacific	181	On-farm research on groundnut, pigeonpea, chickpea and transfer of technology to Semi-Arid Tropics (SAT) farmers of India	1988	ICRISAT	1.068	C
36	Africa	183	Agroforestry Research for the Development of the Drylands of West Africa	1988	ICRAF	1.500	C
37	Africa	183a	Agroforestry Research for the Development of the Drylands of West Africa	1992	ICRAF	1.000	C
38	LAC	192	Adaptive research on sheep production systems for the small farm sector in the Caribbean	1989	CARDI	0.430	C
39	NENA	216	Camel Applied Research Network Programme	1991	ACSAD	1.500	C
40	LAC	256	Regional programme for the development of South American camelids	1993	IICA	0.800	C
41	LAC	256a	Regional programme for the development of South American camelids- Phase II	1996	IICA	0.500	C
42	Asia/Pacific	257	International Network for Bamboo and Rattan (INBAR) research and development programme	1993	CIFOR	0.700	C
43	Asia/Pacific	263	Collaborative research and development of sustainable rice farming systems in Southern Asia - phase II	1993	IRRI	1.380	C
44	NENA	264	Research programme for the development of sustainable crop/livestock production technologies in the low rainfall areas	1993	ICARDA	1.200	C
45	Africa	284	Programme for an integrated approach to trypanosomiasis control technologies and assessment of its impact on agricultural production, human welfare and natural resources in Tse tse-affected areas of Africa	1994	ILRI (ILCA)	0.800	C
46	Global	301	Programme for strengthening the household food security and nutritional aspects of IFAD poverty alleviation projects: developing operational methodologies for project design and monitoring	1995	IFPRI	0.948	C
47	NENA	306	West Asia and North Africa Dryland Durum Wheat Improvement Network (WANADDIN) Programme (ICARDA/CIMMYT Joint Programme)	1995	ICARDA	1.300	C
48	Africa	307	Research on accelerated diffusion of rice technology (RADORT) programme in West Africa	1995	WARDA	0.750	C
49	Africa	308	Development of sericulture and apiculture technologies for enhancing the income generation potential of smallholders in Africa	1995	ICIPE	1.300	C
50	NENA	309	Programme for the establishment of a Regional Animal Disease Surveillance and Control Network (RADISCON) in North Africa, the Middle East, and the Arab Peninsula	1995	FAO	1.250	E
51	Global	318	Enhancement of income-generation potential through the development and transfer of improved cassava genetic material and adoption of post-harvest technologies in Latin America and Africa	1996	CIAT	0.950	C
52	LAC	320	Programme for adaptive research on environmentally sustainable strategies for the control of the tropical bont tick (amblyomma variegatum) from the Caribbean	1996	FAO	1.000	E
53	Asia/Paci	330	Development of an integrated pest management (IPM) programme for the management of pulse	1996	ICRISAT	0.500	C

	fic		pests in Southern Asia				
54	Asia/Pacific	332	Development and transfer of technologies for smallholder bamboo and rattan-based producers from Asia to Africa	1996	IDRC	0.900	C
55	Asia/Pacific	361	Programme for the sustainable use of coconut genetic resources to enhance the incomes and nutrition of coconut smallholders in the Asia and Pacific region	1997	IPGRI	0.907	C
56	NENA	362	Participatory rainfed agricultural technology development and transfer to farmers in the semi-arid areas of the Near East and North Africa	1997	ACSAD	0.660	E
57	Asia/Pacific	363	Adaptive research on improved varieties of jute and allied fibres and their utilization for enhanced income-generation	1997	IJO	0.400	E
58	NENA	364	Programme for the development of a regional strategy for the utilization of the Nubian sandstone aquifer system (NSAS)	1997	CEDARE	0.700	E
59	Africa	375	Programme for developing and disseminating stress-tolerant maize for sustainable food security in East, West and Central Africa	1997	CIMMYT/ IITA	1.000	E
60	Africa	386	Programme for participatory development of environmentally-friendly pest management options towards sustainable vegetable cultivation by smallholders in Sub-Saharan Africa	1997	ICIPE	0.600	E
61	Global	408/408a /544[116]	Research Partnerships and Rural Poverty Alleviation	2001	GFAR	0.3	E
62	Global	411	Integrated management of potato late blight disease: refining and implementing local strategies through farmers' field schools	1998	CIP	1.050	E
63	Africa	457	Poverty alleviation and enhanced food availability in West Africa through improved yam technologies	1999	IITA	1.250	E
64	NENA	485	Sustainable management of natural resources and improvement of major production systems of the Arabian peninsula - Phase II	2000	ICARDA	0.920	E
65	Africa	488	Participatory adaptive research and dissemination of rice technologies in West Africa	2000	WARDA	1.000	E
66	Asia/Pacific	531	Community-based fisheries management (CBFM) programme in south and southeast Asia	2001	ICLARM	0.650	E
67	Africa	543	Evaluating the Impact of Research Partnerships	2001	ENDA	0.1	E
	Total					48.627	

[116] Please note that this TAG and TAG 543 are both considered "small" TAGs.

APPENDIX 5

REVIEW FRAMEWORK

EVALUATION OF

AGRICULTURAL RESEARCH AND TRAINING (AR&T) TECHNICAL ASSISTANCE GRANTS (TAGS)

FRAMEWORK FOR ANALYSIS OF INDIVIDUAL GRANTS

TAG .....

Evaluation Criteria

Basic Information

A. Main features of the TAG

B. Performance Evaluation
Relevance of the goals and objectives
Effectiveness
Efficiency

C. Partnership performance and evaluation
IFAD performance
Implementation partner performance

D. Impact evaluation
Rural poverty impact
Policy and institutional development impact
Sustainability Issues
Sustainability of benefits
Financial sustainability

E. Lessons learned

Rating system used for the evaluation:

HS – Highly successful; S-Successful; MS – Moderately Successful.
U – Unsuccessful; NI – No judgement possible on basis of the available information

<table>
<tr>
<td>Grant No.
Full Title:
Grant Recipient Org.
CGIAR
Non-CGIAR :
Coordinating Institution:

Other partners:
Geographic Coverage
Regional/Global -
Region/s (name)-
Country level Activities in:
Names of national partners:</td>
<td>EB doc. No. & Date
Intended duration:
Approval date:
Date of Start-up:
Date Completed:
Phase no.
Links to Past or Future TAGs:

IFAD Task Manager:</td>
</tr>
<tr>
<td>Key activities summary:

Type of Research (note if minor or major focus):
Strategic
Applied
Adaptive
Technology validation

Socio-economic/policy studies

Methodology development

Extension /communications

Training

Institutional Development/networking</td>
<td>Major Themes

Crops and cropping systems
Livestock/fish development
Natural resource management
Integrated pest management –
Nutrition/HFS –
Impact of development:
Other (specify)-
…………………</td>
</tr>
<tr>
<td>Co-financing Partners

IFAD was lead supporter?</td>
<td>Financing Arrangements in USD for this phase of program (also indicate % of total)
IFAD
Co-financing
Parallel Financing:
Country contribution
Total USD</td>
</tr>
<tr>
<td></td>
<td>Any financing issues to follow up:</td>
</tr>
</table>

Notes for Completing the Framework:

1. ***Rating system for the evaluation: HS – highly successful; S-successful; MS – moderately successful. U – unsuccessful; NI – no judgement possible on basis of the available information.***
2. ***Illustrations: Highlight and provide more detail in bold highlight red and ***, any good illustrations on specific points for the synthesis report, with text reference (including page/paragraph)***
3. ***Follow-up: Note in text, marked ("check) any important points to be followed up in Rome with IFAD staff or in correspondence.***

A. MAIN FEATURES OF THE TAG:

- **IFAD rationale for funding the TAG (as explicit or implicit in EB-PRR) and demand basis:**
- **Goals and objectives of the TAG (detail any discrepancies between original, EB/PRR version and objectives as stated in Final Report):**
- **Components and main activities(detail any discrepancies between original and EB/PRR):**
    - *Nature & extent of integration of any socio-economic research:*
    - *Institutional and management arrangements for the TAG:*
- **M&E arrangements:**

LIST OF ALL REPORTS & DOCUMENTS REVIEWED (no titles):

OVERALL DESIGN ASSESSMENT: *(note– gaps or lack of congruence in the design):*

B. TAG PERFORMANCE EVALUATION

1. RELEVANCE OF THE GOALS & OBJECTIVES

Were the goals & objectives of the grant congruent with IFAD's poverty mandate?

- **Were the goals and objectives of the grant congruent with that of the AR&T Program?**
- **Were the goals and objectives of the grant congruent with the IFAD regional strategy or strategies if in place at the time of the TAG design(e.g. as indicated by examples of related projects in the EB PRR)?**
- **Have the goals and objectives changed during implementation? Why? Was this agreed/not agreed with IFAD?**

Notes & Rating ...

2. EFFECTIVENESS

2.1 Achievement of Objectives

Did implementation achieve the major objectives of the TAG (specify by objective if possible, with reasons

- **Any post- completion activities (research or other) that are needed for achievement of any unachieved or partially achieved objectives?**
- **Are the outputs of the research likely to be of value to further research or disseminated over short, medium or long-term?**

Notes & Rating:

2.2 Linkages with IFAD Loan Portfolio

- **What reference is there to forward, backward or parallel linkages to IFAD loan projects in documents (proposals and reports)? Detail.**
- **Was there potential for linkages with IFAD loan projects through the TAG generated technical recommendations or knowledge or expertise that appear not to have occurred? If yes, why?**
- **What positive or negative lessons emerged for facilitating useful linkages?**

Notes & Rating:

2.3 Participatory Performance

a) With Government partners

- **What evidence is there of active NARS (including Universities) or other government involvement in research implementation and how effective and equal was the partnership (e.g. ownership)?**
- **What were the main factors in success or failure of the partnership?**

Notes & Rating: MS

b) With Non-government and farmer organizations

- **Have NGOs, or similar non-government organizations, been involved and in what way (in priority, planning, setting, implementation or evaluation)?**
- **What involvement has there been of CBOs, farmer associations, women's groups and in what way (in priority, planning, setting, implementation or evaluation)?**
- **What involvement has there been of individual male or female farmers/households and in what way (in priority, planning, setting, implementation or evaluation)?**
- **Did such (above) partnerships have any impact on research outcomes? .**
- **What were the main factors in success or failure of grassroots participation?**

Notes and Rating:

3. EFFICIENCY

3.1 Economic Efficiency

- **Was there ex-ante projection of cost/benefit assessment of the project? If yes, how do the results compare to projections?**

3.2 Financial & Managerial Efficiency

Lead-time from initial proposal to EB and EB PRR to start up?

- **Number of extensions.**
- **Any references to delays in release of funds, procurement, response to queries or remedial action?**

Notes & Rating:

C. PARTNERSHIP PERFORMANCE EVALUATION

1. IFAD PERFORMANCE

Is there evidence of IFAD supervision of this TAG (direct – not through CGIAR)? PT or Regional? Note any records of field visits, discussions of issues at CGIAR meetings, or other similar contacts.

- **Has IFAD extracted and shared useful lessons from the TAG? NA**
- **Are some lessons available for potential users in IFAD to improve their performance? What were the constraints to extracting lessons?**

Notes & Rating:

2. IMPLEMENTATION PARTNER PERFORMANCE

- **Was implementation timely and well managed by all partners and how well did the co-ordination work? Implementation seem to have progressed in a timely manner.**
- **Was reporting performance of the co-ordinating institution to IFAD, timely and adequate (including in terms of not only discussing biophysical aspects but also adoptability of improved technologies and any policy or implementation problems or constraints)?**
- **What level of commitment was evident amongst national partners to the program?**
- **What was the monitoring arrangement and how well did it work?**
- **Was there any impact evaluation conducted of the research program as a whole, or any other major impact assessment done (any reports mentioned/available)?**

Notes & Rating:

***OVERALL PERFORMANCE OF THE TAG:** (combines all sections of both B &C above)...*

D. IMPACT EVALUATION

Note: impact in this context refers to the impact of this phase of a line of research to which IFAD has contributed, without attempt to separate out the specific impact of the IFAD contribution, unless separate data is available.

1. RURAL POVERTY IMPACT

Did the research generate a completed technical or methodological solution and can it be classified as "pro-poor technology" (affordable and otherwise appropriate to the circumstances of the poor)?

- **Do the available progress & completion reports discuss poverty relevance, issues that affect adoptability of the technologies, or actual impact?**

- **What linkages have been established during implementation between research and development services (such as extension, farmer associations) which could deliver the research outputs to poor farmers?**

Notes & Rating:

2. POLICY & INSTITUTIONAL DEVELOPMENT IMPACT

- **What impact has this TAG had at the international or regional research institute level in terms of capacity development for poverty-relevant research? Is capacity matched with actual interest or commitment?**

- **What impact has there been at the NARS or other government level in terms of capacity development for poverty-relevant research or action?**

- **What impact has there been at the NARS or other government level in terms of changes in the operational modalities of research and or research policy which can be linked to the socio-economic work facilitated by the TAG?**

- **Has IFAD had an impact at the CGIAR, GFAR or other related global co-ordinating body level through this TAG, which has leveraged funding or promoted poverty-related research or policies? (Note also any direct leveraging of funding?**

- **What was the added value of IFAD funding of this research and in the absence of IFAD funding would this have been carried out by this institution?**

Notes & Rating: S

3. SUSTAINABILITY ISSUES

3.1 Sustainability of Benefits

- **How critical was this research to the sustainability of the activity being researched and can the outputs be judged to be technically sound, socio-culturally feasible, environmentally sustainable?**

- **What main risks or uncertainties have been recognized or are evident in *using* the technology packages or approaches that have resulted from the activities supported?**

3.2 Financial sustainability

- **How long term has been the IFAD financial commitment to this line of research with this implementing partner/s and is there an exit strategy and/or a recognized exit-point? (note also if builds on earlier related research, or, if was one phase of a planned multi-phase commitment).**

- **Is the R&E system of the collaborating countries likely to support this area of research after TAG project completion? No.**

Notes & Rating:

OVERALL DEVELOPMENT IMPACT: *(combines 1-3 above and includes any negative or unanticipated actual or potential impact)*

E. LIST OF MAIN LESSONS LEARNED

(From Review of this TAG-
refers to lessons for IFAD on non-technical issues)

APPENDIX 6

QUESTIONNAIRE

Questionnaire for Technical Assistance Grants (TAGs) for agricultural research co-financed by IFAD

(Please expand the space allowed as needed)

Part A

Involvement in the research projects by respondents

1a. According to our records, during the period 1979-2001 your institution has implemented … research projects co-financed by IFAD:

1b. Please add any other research project carried out by your institution and co-financed by IFAD that you are aware of:

We would be grateful if someone in your institution who is very familiar/familiar with the research projects mentioned under 1a, and any other project you may have mentioned under 1b, could please answer all the questions under Part B.

If however, there may not be a respondent(s) who is familiar with some of the projects mentioned above, please indicate in the spaces below which of these projects will be subject to your review, including the years of implementation:

Thank you.

Should you have any queries when filling in the questionnaire, please do not hesitate to contact either Ms Mona Bishay, Senior Evaluator, at m.bishay@ifad.org, or Ms Dalia Mattioni, Evaluation Consultant, at d.mattioni@ifad.org

Part B

1. Institutional partnerships

a) Which institutional partnerships were involved?

Institutional partnership with the organization	Response (Yes or No)	Number of projects in this group
a. Agricultural research organization from a developing country (NARS)		
b. Agricultural research organization from a developed country		
c. Public sector extension organizations		
d. Non-government organizations (NGOs)		
e. A donor funded development project		
f. Another international research center		
g. Any other (specify)..........................		

b) What are the main problems and/or lessons which emerged in implementing collaborative research partnerships with any of the above? (please mention the salient features of the experiences with each type of organization separately)

2. Governance System

a) What was the nature of the governance system that guided the institutional partnership?

Nature of the governance	Please Tick	No. of projects in this group
a. Research guided by a steering committee		
b. Frequent informal consultation with research leaders of partner institutions		
c. Occasional informal consultation with research leaders of partner institutions		
d. Workshops of research partners		
e. No consultation with partners followed		
f. Any other (specify)..........................		

b) What main problems and/or lessons emerged?

3. Capacity Building for NARS

a) What has been your experience in building capacity of weaker developing country NARS?

b) Has the IFAD funded program helped in any way to alleviate capacity weaknesses? If yes, please explain briefly

c) What problems and/or lessons have emerged from such experience?

4. Research priorities

a) How did you define the research priorities of the projects?

The research agenda/priorities were defined:	Please Tick	No. of projects in this group
a. in collaboration with IFAD and/or other donors		
b. through consultation with farmers		
c. through diagnostic surveys with a multi-disciplinary research team		
d. based on previous experience with similar research project(s)		
e. was already defined in the organization's Medium Term Plan		
f. there was no need for identification of research priorities		
g. any other (specify)...........................		

b) How well does this type of research fit into your institution's core research agenda?

Extent of match between project & institutional agenda	Please Tick
a. Matches completely	
a. A reasonable match	
c. Does not match	

c) Please note any capacity constraints your institution has (has had) in implementing the above type of research.

5. Research approach

a) How extensively does your organization use systems approach (e.g. Farming Systems Research) for on-farm trials involving participatory methodologies?

b) How well has this worked under the IFAD financed programmes or under other partner financed activities?

c) What problems or lessons emerged during farmer participatory testing (if relevant)?

6. The role of socio-economic research

a) Were there any efforts under the research project to integrate socio-economic research with biophysical research?

☐ **Yes** ☐ **No**

b) What problems and/or lessons emerged?

7. Research Outcome

a) Briefly describe the most important technology or capacity outcomes from the project, noting extent of relevance to small farmers or other poor

b) What special efforts were made to facilitate dissemination of the technology?

Please specify the special efforts	**Responses Yes or No**	**No. of projects in this group**
a. Development of a technology advisory note		
b. Collaboration with extension system staff		
c. Direct promotion of the technology to farmers under the project		
d. Other......................		

c) What problems and/or lessons emerged in dissemination?

8. Research Impact

a) What impact evaluations have you or your national partners carried out or published on those research programmes which IFAD co-financed, in addition to the reports regularly sent to IFAD?

b) What are the salient features of your experience with impact evaluation of donor financed research programmes? Which related recommendations would you make to IFAD?

9. Link with IFAD loan financed agriculture investment projects

a) Did the research projects attempt any direct links with an IFAD ongoing or pipeline (preparation stage) investment (loan-financed) project?

☐ **Yes** ☐ **No**

If "yes", how many projects? ______________________________

b) If links to investment projects were attempted, please specify nature of the linkages and whether they facilitated the research or dissemination of the technology

c) What problems and/or lessons emerged from this attempt?

d) What could IFAD do on its side to make such linkages easier to achieve?

10. Suggestions/comments for IFAD

a) What general suggestions do you have for IFAD to improve the effectiveness or efficiency of its support to institutions such as yours?

b) Please add any specific recommendations/comments you have for IFAD on such topics as: grant processing procedures, reporting requirements, disbursement procedures, supervision, evaluation or other similar aspects?

c) Any additional observations you wish to add, especially to enhance the value/impact of IFAD's Agriculture Research Grant Programme?

Identification of the respondent(s)

Name of the respondent(s)	
Position of the respondent(s) in the institution	
Position/role of respondent (s) vis-à-vis the IFAD supported research	

Thank you

APPENDIX 7

QUESTIONNAIRE RESPONDENTS

Institution	Questionnaire sent	Questionnaire received
CGIARs		
CIAT	✔	✔
CIFOR	✔	✔
CIMMYT	✔	
CIP	✔	✔
ICARDA	✔	✔
ICLARM	✔	✔
ICRAF	✔	✔
ICRISAT	✔	✔
IFPRI	✔	✔
IITA	✔	✔
ILRI	✔	✔
IPGRI	✔	✔
IRRI	✔	✔
IWMI	✔	✔
WARDA	✔	✔
Total = 15		**Total = 14**
Non-CGIARs		
ACSAD	✔	✔
AOAD	✔	✔
CARDI	✔	✔
CATIE	✔	✔
CEDARE	✔	
CIHEAM	✔	
FAO	✔	✔
ICIPE	✔	✔
IDRC	✔	✔
IFDC	✔	✔
IICA	✔	✔
INBAR	✔	✔
INFOSAMAK	✔	
OAU/STRC	✔	
SSO	✔	✔
RADHORT	✔	
Total = 16		**Total = 11**
Grand Total = 31		

APPENDIX 8

LIST OF INSTITUTIONS VISITED

Region	Institutions visited
Asia	IRRI
Africa	ICRAF ILRI ICIPE IITA
NENA	ACSAD ICARDA
Latin America	CIP IICA

APPENDIX 9

AGRICULTURAL RESEARCH AND TRAINING TECHNICAL ASISSTANCE GRANTS BY REGIONS*

1979-2001

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] (million USD)
			Africa					
1	Africa	2	Root and Tuber Research	1979	IITA	1.100		
2	Africa	2a	Root and Tuber Research	1980	IITA	1.200		
3	Africa	2b	Root and Tuber Research	1981	IITA	1.400		
4	Africa	2c	Root and Tuber Research	1982	IITA	1.000		
5	Africa	2d	Root and Tuber Research	1983	IITA	1.150		
6	Africa	2e	Root and Tuber Research	1984	IITA	1.000		
7	Africa	3	Rice Research	1979	WARDA	0.450		
8	Africa	3a	Rice Research	1980	WARDA	0.520		
9	Africa	3b	Rice Research	1981	WARDA	0.600		
10	Africa	3c	Rice Research	1982	WARDA	0.400		
11	Africa	3d	Rice Research	1983	WARDA	0.300		
12	Africa	3e	Rice Research	1984	WARDA	0.200		
13	Africa	3f	Rice Research	1985	WARDA	0.400		
14	Africa	4	Desert Locust Control	1979			DLCO	0.190
15	Africa	16	Food procesing equipment for rural women in Africa	1989			UNIDO	0.500
16	Africa	36	Biological control of the cassava mealybug and the green mite	1980	IITA	0.281		
17	Africa	36a	Biological control of the cassava mealybug and the green mite	1982	IITA	0.500		
18	Africa	39	Research on Crop Borers	1980			ICIPE	0.654
19	Africa	39a	Research on Crop Borers	1981			ICIPE	0.670
20	Africa	39b	Research on Crop Borers	1982			ICIPE	0.900
21	Africa	39c	Research on Crop Borers	1982			ICIPE	1.160
22	Africa	39d	Research on Crop Borers	1983			ICIPE	1.100
23	Africa	39e	Research on Crop Borers	1984			ICIPE	0.900
24	Africa	39f	Research on Crop Borers	1985			ICIPE	0.800
25	Africa	39g	Research on Crop Borers	1987			ICIPE	0.600
26	Africa	39h	Research on Crop Borers	1988			ICIPE	0.853
27	Africa	40	Research on Arid Zones Livestock Systems	1980	ILRI (ILCA)	0.460		
28	Africa	40a	Research on Arid Zones Livestock Systems	1981	ILRI (ILCA)	0.650		
29	Africa	40b	Research on Arid Zones Livestock Systems	1982	ILRI (ILCA)	0.600		

* It is important to note that there is a discrepancy between the data on Research Grants furnished by IFAD's 2001 Annual Report, and the data on which the present study is based (drawn from the Technical Division's data base). Between 1979 and 2001 (included), the Annual Report accounts for 191 research grants allocated by IFAD for CGIAR and non-CGIAR centres, for a total of USD 154.6 million.

	Region	TAG No.	Programme Name	Year of Approval	Benefiting Institution (CGIAR)	Total Grant Amount (million USD)	Benefiting Institution (non-CGIAR)	Total Grant Amount (million USD)
30	Africa	40c	Research on Arid Zones Livestock Systems	1983	ILRI (ILCA)	0.600		
31	Africa	40d	Research on Arid Zones Livestock Systems	1984	ILRI (ILCA)	0.500		
32	Africa	40e	Research on Arid Zones Livestock Systems	1985	ILRI (ILCA)	0.500		
33	Africa	40f	Research on Arid Zones Livestock Systems	1988	ILRI (ILCA)	0.550		
34	Africa	72	Research on Plantain Production in Africa	1981	IITA	0.210		
35	Africa	72a	Research on Plantain Production in Africa	1982	IITA	0.300		
36	Africa	72b	Research on Plantain Production in Africa	1983	IITA	0.350		
37	Africa	72c	Research on Plantain Production in Africa	1984	IITA	0.300		
38	Africa	72d	Research on Plantain Production in Africa	1985	IITA	0.250		
39	Africa	72e	Research on Plantain Production in Africa	1986	IITA	0.200		
40	Africa	77	Research on nutritional effects of technological and policy changes in agriculture	1981	IFPRI	0.100		
41	Africa	77a	Research on nutritional effects of technological and policy changes in agriculture	1982	IFPRI	0.200		
42	Africa	77b	Research on nutritional effects of technological and policy changes in agriculture	1983	IFPRI	0.160		
43	Africa	79	Fertilizer research programme in Africa	1981			IFDC	0.880
44	Africa	79a	Fertilizer research programme in Africa	1982			IFDC	1.000
45	Africa	79b	Fertilizer research programme in Africa	1983			IFDC	1.100
46	Africa	110	Research and development for food grains in semi-arid regions of Africa	1983			OAU/STRC	1.000
47	Africa	110a	Research and development for food grains in semi-arid regions of Africa	1984			OAU/STRC	0.600
48	Africa	110b	Research and development for food grains in semi-arid regions of Africa	1985			OAU/STRC	1.200
49	Africa	110c	Research and development for food grains in semi-arid regions of Africa	1987			OAU/STRC	1.400
50	Africa	110d	Research and development for food grains in semi-arid regions of Africa	1988			OAU/STRC	0.800
51	Africa	120	Nutritional Effects of Cash Cropping	1984	IFPRI	0.200		
52	Africa	120a	Nutritional Effects of Cash Cropping	1985	IFPRI	0.250		
53	Africa	120b	Nutritional Effects of Cash Cropping	1986	IFPRI	0.250		
54	Africa	136	Biological Control of Cassava Pests	1985	IITA	0.500		
55	Africa	136a	Biological Control of Cassava Pests	1986	IITA	0.500		
56	Africa	136b	Biological Control of Cassava Pests	1987	IITA	0.500		
57	Africa	136c	Biological Control of Cassava Pests	1988	IITA	0.600		
58	Africa	142	Research Programme on Irrigation Water Management	1985	IIMI	1.683		
59	Africa	183	Agroforestry Research for the Development of the Drylands of West Africa	1988	ICRAF	1.500		
60	Africa	183a	Agroforestry Research for the Development of the Drylands of West Africa	1992	ICRAF	1.000		

In contrast to this, and for the same period of time, the number of Agricultural Research and Training (AR&T) TAGs reported for the present study are 199 and the total amount granted is USD 171.541 million. The data base for this study therefore contains 8 AR&T TAGs more than the Annual Report for a total of USD 16.914 million. Three of these TAGs are run by CGIAR centres (TAGs: 485-ICARDA, 486-ICRAF, 534-ICRAF), and 5 are run by non-CGIAR centres (TAGs: 4-DLCO, 16-UNIDO, 213-FAO, 536-CIHEAM, 562-RADHORT). In terms of the discrepancy in the amount of funds allocated (equal to USD 16.941 million) there are several reasons that account almost entirely for this difference. The 8 extra TAGs included in this study's data base account for USD 10.96 million. An additional USD 4.427 million may be accountable to the cancellations of certain grants throughout the years.

61	Africa	190	In-Country research on Alley Farming	1989	IITA	1.220		
62	Africa	191	Semiochemicals research for sustainable management and control of the desert locust - Phase I	1989			ICIPE	2.500
63	Africa	191a	Semiochemicals research for sustainable management and control of the desert locust - Phase II	1997			ICIPE	1.000
64	Africa	235	Foreign exploration of natural enemies of the cassava green spider mite in Africa	1992	IITA	0.500		
65	Africa	262	Research on Alley Farming - Phase 2	1993	IITA	0.640		
66	Africa	284	Programme for an integrated approach to trypanosomiasis control technologies and assessment of its impact on agricultural production, human welfare and natural resources in Tse tse-affected areas of Africa	1994	ILRI (ILCA)	0.800		
67	Africa	284a	Programme for an integrated approach to trypanosomiasis control technologies and assessment of its impact on agricultural production, human welfare and natural resources in Tse tse-affected areas of Africa - Phase II	1998	ILRI (ILCA)	0.900		
68	Africa	285	Programme for the ecologically sustainable management of maize pests in Sub-Saharan Africa	1994	IITA	0.500		
69	Africa	307	Research on accelerated diffusion of rice technology (RADORT) programme in West Africa	1995	WARDA	0.750		
70	Africa	308	Development of sericulture and apiculture technologies for enhancing the income generation potential of smallholders in Africa	1995			ICIPE	1.300
71	Africa	319	Development of strategies for in situ conservation and utilization of plant genetic resources in desert-prone areas of Africa	1996	IPGRI	0.800		
72	Africa	322	Networks on soil fertility restoration and management in resource poor areas of Sub-Saharan Africa	1996			IFDC	1.000
73	Africa	351	Adaptive research programme on improving the adoptability of promising agroforestry technologies in IFAD investment project areas in the Sahel	1996	ICRAF	1.080		
74	Africa	375	Programme for developing and disseminating stress-tolerant maize for sustainable food security in East, West and Central Africa	1997	CIMMYT/ IITA	1.000		
75	Africa	376	Programme for enhancing the impact of immunization against East Coast fever with an improved sub-unit vaccine on the smallholder dairy sector in Eastern Africa	1997	ILRI	0.600		

While these cancellations are reported in the Annual Reports, the present study has concentrated its efforts on the amounts *originally allocated* for the grant by the Board, regardless of subsequent cancellations. Finally, in 1997 a number of revisions were introduced in the data base used for the Annual Report. Among these changes is a subtracion of approximately USD 1 million due to a “review of past records of grant approval”[117].

[117] Footnote to Table 10, p. 44, IFAD Annual Report, 1998.

	Region	TAG No.	Programme Name	[illegible]	[illegible] Institution (CGIAR)	[illegible] Grant (million USD)	[illegible] Institution (Non-CGIAR)	Total Grant Amount (million USD)
76	Africa	384	Programme to improve crop-livestock productivity through efficient nutrient management in mixed farming systems of semi-arid West Africa	1997	ILRI	0.600		
77	Africa	386	Programme for participatory development of environmentally-friendly pest management options towards sustainable vegetable cultivation by smallholders in Sub-Saharan Africa	1997			ICIPE	0.600
78	Africa	412	Development & Application of a Biological Control Programme for the Cassava Green Mite	1998	IITA	1.500	ICIPE	
79	Africa	426	Programme for the sustainable management of African fruit flies	1998			ICIPE	1.000
80	Africa	442	Farmer participatory testing of technologies to increase sorghum and pearl millet production in the Sahel	1999	ICRISAT	1.500		
81	Africa	456	Diversification of smallholder farming systems in West and Central Africa through cultivation of indigenous trees	1999	ICRAF	1.000		
82	Africa	457	Poverty alleviation and enhanced food availability in West Africa through improved yam technologies	1999	IITA	1.250		
83	Africa	487	Applied and adaptive research on cowpea in semi-arid zones of West Africa	2000	IITA	1.600		
84	Africa	488	Participatory adaptive research and dissemination of rice technologies in West Africa	2000	WARDA	1.000		
85	Africa	491	Programme for trial and validation of promising income generation options for the rural communities in Africa-based on sericulture and apiculture technologies	2000			ICIPE	1.600
86	Africa	535	Development of sustainable integrated soil fertility management strategies for smallholder farms in sub-Saharan Africa	2001			IFDC	1.435
87	Africa	554	Programme for Enhancing the Diffusion of New Tsetse Control Technologies for Improved Livestock Health and Productivity in Smallholder Indigenous Communities of Sub-Saharan Africa	2001	ILRI	1.258		
88	Africa	562	Programme for Sustainable Vegetable Production and Marketing in West Africa	2001			RADHORT	1.250

The reason for this discrepancy lies essentially in the absence of a coherent and homogenous definition of Agricultural and Training TAGs as opposed to other TAGs within IFAD. So, while some divisions classify certain TAGs under a specific budget line, other divisions may classify the same TAGs under another budget line. It is imperative that a homogenous classification be made across divisions in order to avoid such discrepancies in the future.

	Region	No.	Programme Name	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			Asia/Pacific					
89	Asia/Pac.	35	Rice Based Cropping Systems Research	1980	IRRI	1.000		
90	Asia/Pac.	35a	Rice Based Cropping Systems Research	1981	IRRI	1.700		
91	Asia/Pac.	35b	Rice Based Cropping Systems Research	1982	IRRI	1.600		
92	Asia/Pac.	35c	Rice Based Cropping Systems Research	1983	IRRI	1.700		
93	Asia/Pac.	35d	Rice Based Cropping Systems Research	1984	IRRI	1.300		
94	Asia/Pac.	35e	Rice Based Cropping Systems Research	1985	IRRI	0.600		
95	Asia/Pac.	148	Agricultural Research on Rainfed Rice Production	1986	IRRI	1.342		
96	Asia/Pac.	162	Research and Training Programme on Azolla	1987	IRRI	0.140		
97	Asia/Pac.	163	Farmer Managed Irrigation Systems Research	1987	IIMI	0.150		
98	Asia/Pac.	163a	Farmer Managed Irrigation Systems Research -Phase II	1991	IIMI	0.150		
99	Asia/Pac.	167	Research programme on the impact of fish culture within the farming system	1987	ICLARM	0.200		
100	Asia/Pac.	167a	Research programme on the socio-economic impact of fish culture extension on the farming systems in Bangladesh - phase II	1994	ICLARM	0.401		
101	Asia/Pac.	181	On-farm research on groundnut, pigeonpea, chickpea and transfer of technology to Semi-Arid Tropics (SAT) farmers of India	1988	ICRISAT	1.068		
102	Asia/Pac.	257	International Network for Bamboo and Rattan (INBAR) research and development programme	1993	CIFOR	0.700		
103	Asia/Pac.	263	Collaborative research and development of sustainable rice farming systems in Southern Asia - phase II	1993	IRRI	1.380		
104	Asia/Pac.	330	Development of an integrated pest management (IPM) programme for the management of pulse pests in Southern Asia	1996	ICRISAT	0.500		
105	Asia/Pac.	332	Development and transfer of technologies for smallholder bamboo and rattan-based producers from Asia to Africa	1996			IDRC	0.900
106	Asia/Pac.	350	Research programme on increasing and sustaining the productivity of fish and rice in the flood-prone ecosystems in South and Southeast Asia	1996	ICLARM	0.585		
107	Asia/Pac.	361	Programme for the sustainable use of coconut genetic resources to enhance the incomes and nutrition of coconut smallholders in the Asia and Pacific region	1997	IPGRI	0.907		
108	Asia/Pac.	363	Adaptive research on improved varieties of jute and allied fibres and their utilization for enhanced income-generation	1997			IJO	0.400

	Region	TAC No.	Programme Name	Year of Approval	Benefiting Institution (CGIAR)	Total Grant Amount (million USD)	Benefiting Institution (non-CGIAR)	Total Grant Amount (million USD)
109	Asia/Pac.	383	Programme for action research on local forest management in Asia: implications for smallholder livelihoods, tenure and governance and related impacts on forest-fringe dwellers	1997	CIFOR	1.000		
110	Asia/Pac.	399	Development opportunities in the non-farm sector: a review of issues and options in Asia	1998	IFPRI	0.250		
111	Asia/Pac.	424	Validation and delivery of new technologies for increasing the productivity of flood-prone rice lands in South and Southeast Asia	1998	IRRI	1.000		
112	Asia/Pac.	425	Integrated feed and livestock production in the Steppes of Central Asia	1998	ICARDA	1.500		
113	Asia/Pac.	443	Development and testing of an integrated approach to the control of gastro-intestinal parasites in small ruminants in South and South-East Asia	1999	ILRI	0.875		
114	Asia/Pac.	444	Participatory evaluation, adaptation and adoption of environmentally friendly nutrient management technologies for resource-poor farmers	1999			IFDC	1.000
115	Asia/Pac.	484	Rising demand for maize and intensification of Asian upland farming systems: policy options for productivty enhancement, environmental protection and food security	2000	CIMMYT	0.750		
116	Asia/Pac.	486	Technical and institutional innovations and implementation support to IFAD projects to enhance participatory development of the uplands poor in Asia	2000	ICRAF	1.100		
117	Asia/Pac.	518	Development and diffusion of technologies for smallholder bamboo- and rattan-based producers - Phase II	2000			INBAR	1.295
118	Asia/Pac.	531	Community-based fisheries management (CBFM) programme in south and southeast Asia	2001	ICLARM	0.650		
119	Asia/Pac.	532	Programme for farmer-participatory improvement of grain legumes in rainfed Asia	2001	ICRISAT	1.300		
120	Asia/Pac.	534	Programme for developing mechanisms to reward the upland poor of Asia for the environment services they provide	2001	ICRAF	1.400		

	Region	TAG No.	Programme Name	Approval Date	Recipient Institution (CGIAR)	Total Grant Amount (million USD)	Recipient Institution (non-CGIAR)	Total Grant Amount (million USD)
			Global					
121	GLO	200	Development of cassava germplasm for the drier tropics and subtropical agro-ecosystems of Africa, Asia and Latin America	1990	CIAT	0.950		
122	GLO	301	Programme for strengthening the household food security and nutritional aspects of IFAD poverty allevation projects: developing operational methodologies for project design and monitoring	1995	IFPRI	0.948		
123	GLO	318	Enhancement of income-generation potential through the development and transfer of improved cassava genetic material and adoption of post-harvest technologies in Latin America and Africa	1996	CIAT	0.950		
124	GLO	411	Integrated management of potato late blight disease: refining and implementing local strategies through farmers' field schools	1998	CIP	1.050		
125	GLO	533	Programme for enhancing the contribution of neglected and underutilized crops to food security and to the incomes of the rural poor	2001	IPGRI	1.410		
			Latin America and the Caribbean					
126	LAC	33	Research on Field Beans	1980	CIAT	0.770		
127	LAC	33a	Research on Field Beans	1981	CIAT	0.900		
128	LAC	33b	Research on Field Beans	1982	CIAT	1.000		
129	LAC	33c	Research on Field Beans	1983	CIAT	1.150		
130	LAC	33d	Research on Field Beans	1984	CIAT	1.000		
131	LAC	33e	Research on Field Beans	1985	CIAT	0.500		
132	LAC	38	Research on Annual Crops	1980			CATIE	0.560
133	LAC	38a	Research on Annual Crops	1981			CATIE	1.100
134	LAC	38b	Research on Annual Crops	1982			CATIE	1.400
135	LAC	38c	Research on Annual Crops	1983			CATIE	1.246
136	LAC	38d	Research on Annual Crops	1984			CATIE	0.850
137	LAC	71	Research on Improved Food Sorghum for Latin America	1981	ICRISAT	0.300		
138	LAC	71a	Research on Improved Food Sorghum for Latin America	1982	ICRISAT	0.300		
139	LAC	71b	Research on Improved Food Sorghum for Latin America	1983	ICRISAT	0.350		
140	LAC	71c	Research on Improved Food Sorghum for Latin America	1985	ICRISAT	0.250		

	Region	TAC No.	Programme Name	Year of Approval	Benefiting Institution (CGIAR)	Total Grant Amount (million USD)	Benefiting Institution (non-CGIAR)	Total Grant Amount (million USD)
141	LAC	71d	Research on Improved Food Sorghum for Latin America	1986	ICRISAT	0.250		
142	LAC	71e	Research on Improved Food Sorghum for Latin America	1987	ICRISAT	0.250		
143	LAC	192	Adaptive research on sheep production systems for the small farm sector in the Caribbean	1989			CARDI	0.430
144	LAC	201	Programme for the devolution of CIMMYT training activities to a Regional Wheat Production Training Centre at the National Agricultural Technology Institute (INTA), Pergamino, Argentina	1990	CIMMYT	0.730		
145	LAC	256	Regional programme for the development of South American camelids	1993			IICA	0.800
146	LAC	256a	Regional programme for the development of South American camelids- Phase II	1996			IICA	0.500
147	LAC	283	Programme for the devolution of regional training on maize crop management research to the Brazilian agricultural research enterprise (EMBRAPA), National Maize and Sorghum Research Centre (CNPMS), Brazil	1994	CIMMYT	1.211		
148	LAC	320	Programme for adaptive research on environmentally sustainable strategies for the control of the tropical bont tick (amblyomma vairegatum) from the Caribbean	1996			FAO	1.000
149	LAC	321	Regional programme for the control of the carambola fruit fly from South America	1996			IICA	1.000
			The Near East and North Africa					
150	NENA	1	Applied research on broadbeans in the Nile Valley	1979	ICARDA	1.140		
151	NENA	1a	Applied research on broadbeans in the Nile Valley	1980	ICARDA	0.960		
152	NENA	1b	Applied research on broadbeans in the Nile Valley	1981	ICARDA	0.920		
153	NENA	1c	Applied research on broadbeans in the Nile Valley	1982	ICARDA	1.300		
154	NENA	1d	Applied research on broadbeans in the Nile Valley	1983	ICARDA	1.500		
155	NENA	1e	Applied research on broadbeans in the Nile Valley	1984	ICARDA	1.500		
156	NENA	1f	Applied research on broadbeans in the Nile Valley	1986	ICARDA	0.600		
157	NENA	1g	Applied research on broadbeans in the Nile Valley	1987	ICARDA	0.300		
158	NENA	1h	Applied research on broadbeans in the Nile Valley	1988	ICARDA	0.100		
159	NENA	37	Research and development on wheat and barley in semi-arid regions	1980			ACSAD	0.915
160	NENA	37a	Research and development on wheat and barley in semi-arid regions	1981			ACSAD	0.964
161	NENA	37b	Research and development on wheat and barley in semi-arid regions	1982			ACSAD	1.140
162	NENA	37c	Research and development on wheat and barley in semi-arid regions	1983			ACSAD	0.550

	Region	TAC No.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
163	NENA	37d	Research and development on wheat and barley in semi-arid regions	1984			ACSAD	0.954
164	NENA	37e	Research and development on wheat and barley in semi-arid regions	1985			ACSAD	0.850
165	NENA	70	Applied research on cereals in West Asia and North Africa	1981	ICARDA	0.520		
166	NENA	70a	Applied research on cereals in West Asia and North Africa	1982	ICARDA	0.550		
167	NENA	70b	Applied research on cereals in West Asia and North Africa	1983	ICARDA	0.650		
168	NENA	78	Training and Research on Potatoes	1981	CIP	0.517		
169	NENA	78a	Training and Research on Potatoes	1982	CIP	0.600		
170	NENA	78b	Training and Research on Potatoes	1983	CIP	0.700		
171	NENA	78c	Training and Research on Potatoes	1984	CIP	0.500		
172	NENA	78d	Training and Research on Potatoes	1985	CIP	0.400		
173	NENA	78e	Training and Research on Potatoes	1986	CIP	0.200		
174	NENA	78f	Training and Research on Potatoes	1988	CIP	0.800		
175	NENA	89	New Headquarter building	1981	ICARDA	3.500		
176	NENA	149	Regional farming systems in the Near East and North Africa region	1986			ACSAD	0.677
177	NENA	149a	Regional farming systems in the Near East and North Africa region	1987			ACSAD	0.781
178	NENA	149b	Regional farming systems in the Near East and North Africa region	1988			ACSAD	0.806
179	NENA	182	Collaborative research and technology transfer programme to increase barley, food legumes and livestock production in North Africa	1988	ICARDA	0.700		
180	NENA	193	Regional pilot biological control programme for the new world screw worm in North Africa	1989			FAO	1.500
181	NENA	202	Date-palm research and development network	1990			ACSAD	1.000
182	NENA	213	Regional large-scale biological control programme for the new world screwworm in North Africa	1990			FAO	4.000
183	NENA	216	Camel Applied Research Network Programme	1991			ACSAD	1.500
184	NENA	264	Research programme for the development of sustainable crop/livestock production technologies in the low rainfall areas	1993	ICARDA	1.200		

	Region	TAC No.	Programme Name	Year Approved	Executing Institution (CGIAR)	Total Grant Amount (million USD)	Executing Institution (non-CGIAR)	Total Grant Amount (million USD)
185	NENA	295	Technical information services for smallholders fisheries development	1994			INFOSAMAK	0.400
186	NENA	306	West Asia and North Africa Dryland Durum Wheat Improvement Network (WANADDIN) Programme (ICARDA/CIMMYT Joint Programme)	1995	ICARDA	1.300		
187	NENA	309	Programme for the establishment of a Regional Animal Disease Surveillance and Control Network (RADISCON) in North Africa, the Middle East, and the Arab Peninsula	1995			FAO	1.250
188	NENA	331	Programme for strengthening agricultural research and human resource development in the Arabian Peninsula	1996	ICARDA	0.750		
189	NENA	352	Integrated pest management (IPM) programme for the control of the date palm red weevil, stem borer and grubs in the Near East and South Asia	1996			AOAD	1.000
190	NENA	362	Participatory rainfed agricultural technology development and transfer to farmers in the semi-arid areas of the Near East and North Africa	1997			ACSAD	0.660
191	NENA	364	Programme for the development of a regional strategy for the utilization of the Nubian sandstone aquifer system (NSAS)	1997			CEDARE	0.700
192	NENA	385	Integrated crop-livestock production in low rainfall areas of Mashreq and Maghreb - Phase II: participatory validation of integrated prototype technology packages to improve adoptability under favourable policy and institution environments	1997	ICARDA	1.500		
193	NENA	413	Programme for the development of a regional strategy for the utilization of the North-Western Sahara aquifer system	1998			OSS	1.065
194	NENA	458	Regional programme for the development and dissemination of improved apiculture technologies in North Africa	1999			ICIPE	0.700
195	NENA	485	Sustainable management of natural resources and improvement of major production systems of the Arabian peninsula - Phase II	2000	ICARDA	0.920		
196	NENA	489	Camel applied research and development network (CARDN) phase II	2000			ACSAD	1.200
197	NENA	517	Applied research programme for the utilization of brackish/saline water in North Africa	2000			ACSAD	0.700
198	NENA	536	Action-research programme on the identification and testing of methodologies and approaches for effective introduction of participatory irrigation management (PIM)	2001			CIHEAM	1.600
199	NENA	553	Programme to Foster Wider Adoption of Low-Cost Durum Technologies	2001	ICARDA	1.100		
			Grand Totals (for CGIAR & Non-CGIAR individually)			**106.156**		**65.385**
							Grand Total	***171.541***

APPENDIX 10

SUMMARY DESCRIPTION OF RESEARCH OUTPUTS FROM TAGS INCLUDED IN THE EVALUATION SAMPLE

	TAG Number /Grantee/Title	Region (Countries)	Key Research Outputs	USD Value (Year)
1	1 (Phases I, II, III)-ICARDA; Applied research on Faba Bean	NENA (Egypt, Sudan, Ethiopia)	A number of improved varieties and crop management practices were developed including use of fertilizers, irrigation, weed control, date/rate and method of seeding. Significantly higher yields were obtained from farmer managed trails from a large number of locations in Egypt and Sudan. Recommendation for identifying children deficient in G 6 PD were released to prevent "favism" nutrient deficiency. A method for avoiding this deficiency was developed which included soaking of beans in 1% acetic acid for 48 hr before cooking	8.32 (1979 to 88)
2	40 (Phases I, II, III)-ILCA; Livestock production systems in Sahel	Africa (Mali, Nigeria, Togo, Benin)	The Phase I successfully examined and documented the social structure of the pastoralists in the delta area of the Niger, including labor patterns, available cash, and involvement in the market economy and studied the rangeland exploitation and herd management practices.. The Phase II defined the role of forage legumes in improving animal production and methods of improving productivity of small ruminants. Phase III worked on agro-silve pastoral system involving alley cropping with leguminous trees to provide protein rich diet for small ruminants. However, the alley cropping system was not accepted by farmers, including women who are responsible for many of the tasks. As the animals free roam, another objective of the TAG to use sheep manure as a fertilizer proved not to be feasible.	3.86 (1980 to 92)
3,4	36-IITA; Research on Biological Control of Cassava Mealybug and Green Spider Mites (CMB and GSM) and 136 and 136 a,b,c,-IITA; Africa-wide project for biological control of cassava	Africa	The TAG supported continued exploration for natural enemies of CMB and CGM in South America and developed mass-rearing techniques for the preferred natural enemy E. lopizi; for releases by ground and air. Training: Out of 35 countries forming the cassava belt of Africa 24 have received training in execution of surveys, release and impact assessment, and rearing of natural enemies at the national level. Some national staff were being helped with their MSc and PhD programs. Strengthening of NBCBP: On CMB all national programs has been supplied with natural enemies for release. Several national programs were prepared for involvement in release and monitoring of predacious mite in major eeological zones for the control of CGM. CGM: After 7 years of research a predacious mite from Brazil was finally established in 1990 following releases in Kenya and Benin. Indications are that CGM can be controlled through classical biological control program involving releases of phytoseiid predator species that have been worked in some parts of West Africa and newly introduced phytoseiid mites which are adapted to highlands and dry conditions.	0.7 (1980 to 83) and 3.0 (1985 to 92)
5	72 (Phase I, II)-IITA; Research on plantain production in Africa	Africa (Nigeria, Gabon, Cameroon, Ghana, Ivory Coast, Zaire)	The TAG helped in collection, identification and multiplication of more productive and disease tolerant cultivars. A rapid multiplication technique using meristem cells was developed and disease free planting material was made available to farmers through the national programs. Research to arrest rapid yield decline in ratoon crop confirmed beneficial effects of mulching and identified species that can be grown as inter-crops to provide mulching material. The formation of regional network (West Africa Regional Research Network on Plantain) amongst six countries in West and	1.61 (1981 to 86) (6 individu

			Central Africa was an important achievement of the TAG.	al TAGs)
6	120-IFPRI; Income and nutrition effects of shift from semi-subsistence to cash cropping	Global (original Kenya & Gambia, later also included Philippines, Guatemala, Rwanda)	The research in Kenya and The Gambia, on IFAD financed or co-financed projects demonstrated how impact of cash cropping could be assessed and gave guidance to planning for predicting such impact. Comparison of female headed households (FHH) with male headed households was included which showed that children of FHH suffering less from malnutrition. There is recognition of income level as a factor in early or late adoption of high-yield rice varieties, with better-off farmers adopting sooner. Same pattern was observed with sugar-cane outgrower scheme.	0.7 1984 to 87
7	148-IRRI; Rainfed rice production in India and Bangladesh	Asia (Bangladesh (BD) and India)	The TAG established a system of classification of rainfed rice environments and a simulation model to characterize the water balance and grain yield. Successful identification of rice cultivars, obtained. The TAG support helped to identify suitable rice varieties for the rainfed environment and strengthened national capacity for this type of work. Research for optimum crop establishment and fertility management practices in a number of rainfed ecologies were completed through on and off-farm trials to link improved genetic material with optimum management practices for maximum gains.	1.342 (1986 Closed India 88 and BD 90
8,9	167-ICLARM; Socio-economic impact of fish culture extension and 167A-Fisheries extension evaluation	Asia (Bangladesh)	TAG 167 was originally approved in 1988 but its start was delayed by almost 2 years due to national problems. It looked at adoption and cost/benefit questions but failed to develop extension strategy. Benefits by the poorest (and usually, landless) were more difficult to achieve than understood at the outset, e.g. a serious constraint is the difficulties faced by the poor in getting secure access to water bodies and lack of social organization. Even though the TAG was prepared in response to IFAD loan portfolio, itfailed to establish effective linkages with the loan project (Oxbow Lakes Project) which was located in an entirely different part of the country and dealt with different water bodies than those part of the TAG program. It did not complete its objective of evaluating socio-economic impact, in spite of extensions. TAG 167a, which also started over two years late (and required reformulation), focused on: comparison of fish culture extension; whole farm analysis and assessment of sustainability of fish culture; and comparative assessment of extension systems and dissemination. It worked on the evaluation component left incomplete during the earlier phase. This phase produced completed technologies for higher productivity which were popular with farmers (carp and talapia) and yields improved due to extension activities with significantly higher returns. Access to water bodies and institutional credit by the poor continued to be a problem.	0.202+0.20 (1988 - 2000)
10	181-ICRISAT; o On-farm Research on Groundnut, Pigeonpea, Chickpea and Transfer of Technology to the Semi-Arid Tropics (SAT) Farmers of India	Asia (India)	The project developed and refined location-specific production technologies for groundnut, pigeonpea, chickpea based on on-farm research; validation through multi-location testing, demonstrations; and capacity building of research staff of the partner agencies. Attention was also given to develop a dissemination strategy and training of extension staff. ICRISAT paid particular attention to maximizing gains by combining improved genetic material of all three crops with suitably altered crop management practices for sustainable improvement in productivity.	1.068 (1988 to 91)
11, 12	183 and 183a-ICRAF; Agro-forestry research	Africa (Mali, Niger,	During the Phase I macro and micro diagnostic work was undertaken to select research topics using a process which at micro level gave limited consideration to preferences of farmers. Except for some	1.6+ 1.0

	for development of drylands in West Africa	Senegal, Burkina Faso)	success with networking, this phase failed to achieve most of its objectives. It also failed to establish any linkages with IFAD loan projects which was an important objective of this TAG. During the Phase II both on- station and on-farm experimentation was undertaken, but technologies ready for dissemination were not generated. The training activities were narrowly focused on diagnosis and design issues and largely involved researchers. Despite serious efforts on the part of IFAD to develop linkages with the loan projects did not occur.	
13	192-CARDI; Small ruminant research in Carribean	LAC	The TAG failed to achieve many of its objectives. It was only when implementation was commenced that it was found that the data for evaluation of small farm systems was to be based was not available. As a result a special study for primary date collection was undertaken which used a lot of resources and time leading to other objectives of the TAG remaining incomplete. The final focus was primarily on nutritional aspects	0.4 (1990 to 95)
14	216-ACSAD; Camel applied research and development network.	NENA (Egypt, Algeria, Iran, Libya, Mauritania, Morocco, Pakistan, Sudan, Syria and Tunisia)	The TAG achieved networking for 10 countries Identification of specific research needs was done to a limited extent. Dissemination of research results was emphasized A Camel Newsletter was started which was published twice a year. Journal of Camel Sciences was published towards the end of Phase I. ACSAD acknowledged that this phase did not produce any technical solutions or packages that were ready for application.	1.5 (1995 to 99)
15, 16	256 and 256a-ILCA; Regional Program for the Development of South American Camelids	LAC (Argentina, Bolivia, Peru, Chile)	The first phase (256) did not have any research activity as it was assumed that technology packages were available ready for dissemination. The TAG established information dissemination mechanism, which in time was expected to become relevant to needs of small camelid breeders. The technology promotion fund established under the project gave out interest free loans for micro-projects for adoption of production or processing technologies.. The second phase (256a) provided additional support (using the same components as phase one) to producers organized in to economic enterprises oriented towards processing and marketing. Implementation progress, however, was patchy. The component dealing with technology transfer and strengthening of growers organizations was not implemented due to failure to secure co-financing support.	0.8+ 0.5 (1993 to 99)
17, 18	257-CIFOR; International network for bamboo and rattan (B&R) research and development; and 332-IDRC: Development and Transfer of Technologies for Smallholder Bamboo and Rattan-Based Producers from Asia to Africa	Asia (257:Nepal, Papua New Guinea, China, India, Philippines; 332: all Asian countries listed above and Cameroon, Ghana, Kenya, Nigeria, Tanzania, Uganda, Zambia in Africa; Colombia,	TAG 257 initially financed work to collect information on economic, policy, institutional and social aspects to form a regional database covering several Asian countries which were part of the International Network on Bamboo and Rattan (INBAR). At the same time case studies were initiated to identify opportunities for interventions and to develop conceptual models of B&R production-to-consumption systems. It also encouraged establishment of community level micro-enterprises. TAG 332 worked on socio-economic and policy studies on post-harvest technologies and their transfer. It completed 9 production-to-consumption case studies: 6 in Africa – Cameroon, Ethiopia, Ghana, Kenya, Nigeria, Tanzania, Uganda; 2 in Latin America – Cost Rica, Peru , and one in Asia. Research on post-harvest technologies focused primarily on uses of bamboo housing in Latin America and research on technologies for bamboo matchsticks in India. Action was taken for phased inter-regional expansion of INBAR, particularly in Africa bur the progress was slow.	0.7+ 0.9 (1993 to 95 and 1997 to 00)

		Ecuador, Mexico, Venezuela in Latin America)		
19	263-IRRI; Sustainable rainfed farming systems in Eastern India	Asia (India)	The work on ecosystem analysis used GIS and remote sensing techniques incorporating a number of parameters relevant to increasing productivity, stability of production and efficient use of natural resources, especially land and water. Based on this analysis an agro-climatic atlas of East India was developed. The component technologies identified by the participating centers for their respective agro-ecological situations were integrated in to system based recommendations to address important environmental or management constraints, e.g. drought, submergence stress, in the rainfed ecologies under specific socio-economic conditions using participatory on-farm research. Multi-location testing of promising technologies was completed. On a more practical level, the project reaffirmed the value of crop density as a major yield determinant under all ecosystems and validated farmer's indigenous technology for coping with stressed environment. The rice-wheat cropping systems work was concentrated the irrigated northwestern region and had limited contact with the rainfed rice work in eastern India.	1.38 (1994 to 99)
20	264-ICARDA; Sustainable crop/livestock production technologies in the low rainfed areas of West Asia and North Africa (The Mashreq and Maghreb Project)	NENA (Algeria, Iraq, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia)	Development and transfer of livestock management technologies succeeded in producing improved feed and fodder production models based on cereal/legume rotations and integrated management (fertilizer/tillage) practices. It also helped to develop low cost urea feed blocks (UFBs) which gave high laming rate and found wide acceptance by farmers. Project also developed improved rangelands and natural pastures regeneration practices. It showed links between rangeland use and government policies especially those related to property rights. Socio-economic analysis of production systems was undertaken to identify factors critical to more sustainable management of natural resources.	1.2 (1994 to 98)
21	284-ILRI: An integrated approach to the assessment of Trypanosomiasis control technologies and their impacts on agricultural production, human welfare and natural resources in Tsetse-affected areas of Africa.	Africa(Ethiopia, Kenya, Zimbabwe, Burkina Faso, Ivory Coast	Viability of an integrated approach (involving vector suppression, chemotherapy and genetic resistance) to manage tsetse and to control trpanosomaisis was demonstrated. The project provided guidance to some countries on localized solutions for Tsetse control and their adoption, assessment of affordability and impact. It examined changes in land use (number, types and uses of livestock) and ecosystem structure due to the disease control. Household surveys to assess historical and recent changes in livestock numbers, the composition of herds, and use of oxen in crop cultivation were undertaken. At the same time potential impact on land use from effective tsetse management was assessed based on natural resource maps, oral history, interviews and field sampling. These highlighted: (i) the importance of participation by farmers and communities as partners for disease and vector control; (ii) the ability to produce attractive private and social returns from effective disease control; and (iii) the potential for intensification of production systems due to good control of disease which can also lead to negative environmental impacts unless conservation measures are adopted. Work is continuing to expand application of recommendations beyond pilot areas under a phase II TAG.	0.8 (1995 to 98)
22	301-IFPRI; Strengthening of household food security	Global	The study was not very successful in meeting its objectives. Only one (instead of four) case study was undertaken. The methodologies and tools developed are not very relevant to needs of IFAD. These show very limited understanding of IFAD and contributed very little new. IFAD has since	0.95

	and nutritional aspects of IFAD poverty projects		developed its own tools for the same purpose.	
23	306-ICARDA/CIMMYT; West Asia and North Africa (WANA) dryland durum wheat improvement network (WANADDIN)	NENA (Algeria, Morocco, Syria, Turkey, Tunisia)	The TAG helped to establish a research network (covering 30 research activities involving 50 national researchers from 5 countries and international centers covering nearly 14 scientific disciplines) to strengthen on-going breeding programs, including continued improvement/screening of durum wheat germplasm and associated technology development activities. This work has helped to identify a number of new varieties combining resistance/tolerance to abiotic (drought, heat, cold, micronutrient deficiency) and biotic (pest and diseases) stresses. It also strengthened capacity for transfer of technologies tailored to needs of dryland durum wheat farmers. On-farm diagnostic surveys highlighted the need for location specific stress tolerant varieties and improvement in on-farm indigenous processing technologies to produce couscous, flat bread, frike and pasta. These activities are largely undertaken by women as an important source of additional income for the family.	1.3 (1996 to 99))
24	307-WARDA: Research on accelerated diffusion of rice technology (RADORT) program in West Africa	Africa (Cote d'Ivoire Senegal The Gambia Nigeria)	Constraints and issues to be addressed in the selected pilot sites in three countries (Cote d'Ivoire, The Gambia and Senegal) were defined. Some progress was made in testing RADORT, a model for accelerated diffusion of rice technologies. However, the TAG was not successful in achieving a significant level of adoption of this model. The review found shortcomings both in the pace and quality of implementation and concluded that the project was not fully staffed to meet its objectives.. The main focus of work seemed to on seed production and distribution.	0.75 (1996 to 99)
25	308-ICIPE; Development of Sericulture and Apiculture technologies for enhancing the income generation potential of small holders and conserving and utilizing the natural resources in Africa	Africa (Kenya (main focus), Uganda, Tanzania, Ethiopia , Libya and some in Eritrea, Rwanda)	**Apiculture**: Modern apiculture, using 10- frame Langstroth hives, has been introduced and colony improvement achieved through natural selection and queen breeding. Harvesting of honey, royal jelly, propolis and venom is being promoted and is widely adopted by farmers. The program is now linking commercial insect farmers to markets and outlets to ensure economically viable enterprises. Further work to build capacity and to establish support services for quality control, processing and marketing is required, **Sericulture**: The research focused on strategies for sustainable conservation of saturniid silkmoths and for the utilization of appropriate genetic races of bombycids as a food resource. After breeding a domestic bivoltine silkworm hybrid suitable for African climate and solving the problems of optimal diet and diseases, the TAG has promoted microenterprises to farmers for cocoon and silk cloth production on a pilot basis. Potential for wild silkworm culture in Kenya and Uganda has been surveyed. Techniques for breeding these species in their natural habitat as a source of tussar silk have been developed and are being evaluated in several locations	1.3 (Jan. 1996 to Dec. 1998)
26	309-FAO: Program for the establishment of a regional animal disease surveillance and control network (RADISCON) in North Africa, the Middle East and the Arab Peninsula	NENA (29 Countries)	The TAG helped to establish the network RADISCON between participating countries and applied a range of surveillance and control measures to an animal disease (sheep pox) to demonstrate the efficacy of the network. The responses to RADISCON concept from the participating countries was positive. However, due to differences in problems and priorities varied levels of commitment and support for implementation of the program was noted. The most important contribution of the TAG was institutional strengthening with extensive training of key personnel. At the sub-regional level the project helped in establishing National Animal Disease Surveillance Systems in all the countries. The sub-regional project on sheep-pox in 4 of the Maghreb countries made good progress but collection of information on diseases and securing of improved information was slow.	1.25 1996 to 2002) On-going
27	318-CIAT; Program for	Global	Limited progress was made in transferring the germplasm adapted to semi-arid conditions from Latin	0.95

	the enhancement of Income-generation potential through development and transfer of improved Cassava and post-harvest technologies	(Brazil Africa: Nigeria, Burkina Faso, Ghana, Chad and Niger. Training activities in: Angola, Mozambique, Sao Tome, Cabo Verde and Guinea Bissau. Asia: Thailand	America to areas in Africa with homologous conditions and assist in the process of adaptation and varietal selection. No progress was made in introducing post harvest value-added technologies compatible with the elite germplasm selected by women farmers according to their nutritional needs, preferences and market potential for different end- uses. To enhance the sustainability and optimize productivity, some field testing was undertaken to compare use of organic v. chemical fertilizers and intercropping with legumes. Good progress was made in training of national scientists in farmer participatory research methodologies.	(1996 to 99)
28	320-FAO; Program for adaptive research on environmentally sustainable strategies for the control of the Tropical Bont Tick (TBT) from the Caribbean.	LAC (All Caribbean islands)	After considerable delay in start-up and changes in IFAD financed activities, the TAG made some progress in studying and testing new technologies. for the control of TBT. This included testing environmentally friendly pheromone decoy tags and biological forms of control as well as their promotion to reduce the use of chemical substances in control program.	1.0 (1998 to 02) On-going
29	330-ICRISAT; Integrated Pest Management (IPM) of pulse pests in South Asia	Asia (Mainly India)	The project successfully developed a number of options for IPM in chickpea and pigeonpea. It encouraged farmer participation, including women, and helped in developing capacity of national partners, including farmers. It promoted successful partnerships between government and non-government agencies. This TAG made an early start to test strategies for dissemination of research outputs using different approaches, including the use of traditional theatre. Several formal and informal networks were established and/or strengthened to facilitate exchange of information amongst different stakeholders.	0.5 (1997 to 00)
31	362-ACSAD: Participatory rainfed agricultural technology development and transfer to farmers in the semi-arid areas of the Near East and North Africa	NENA (Algeria, Jordan, Lebanon, Morocco, Syria, Tunisia)	The TAG conducted multi-location on-farm trails of technology packages suited to low rainfall areas aiming at gradual elimination of fallow in the production system in both arid and semi-arid zones. However, integration of livestock and tillage aspects in the production system were not throughly investigated. In addition, technologies were evaluated on experimental plots without farmer participation. Traditional methods of farmers in different locations were used as controls. This meant that any assumptions on adoption potential were simply extrapolations from the background socio-economic survey, and not really tested. Adoption constraints or affordability were not considered in evaluating technologies for increased productivity. In most cases, the new technologies were much costlier than the traditional ones used by farmers – up to 136% or so, in certain instances, although potential profits were also greater.	0.66 (1997 to 00) On-going
32	363-IJO: Adaptive research on improved varieties of jute and allied fibbers(JAF) and their utilization for	Asia (Bangladesh, China, India, Indonesia, Nepal and Thailand)	The main outcome was testing and release of some improved varieties, which were developed through work undertaken. by the national programs prior to commencement of this TAG, training activities; and sharing of information between the national programs. However, the selected varieties were not integrated with appropriate agronomic practices and post-harvest management systems to maximize benefits and improve farmer income. The TAG gave only limited attention to development	0.4 (1997 to 00) On-going

	enhanced income generation		of post-harvest technologies and to improvement of quality of finished products.	
33	364-CEDARE; Regional strategy for utilization of Nubian sandstone aquifer system (NSAS)	NENA (Egypt, Libya & Sudan (at end Chad added)	The TAG successfully developed an environmentally sound development strategy for sustainable utilization of NSAS by the 4 countries concerned. It also made recommendations for policy changes and an action program for combating desertification. CEDARE conducted training for national collaborators, on groundwater modeling and Geographic Information Systems as well as more practical training on the installation and use of monitoring equipment. The program also provided computers, software, and other similar equipment which improved efficiency of data collection, analysis and monitoring.	0.7 (1998 to 00) On-going
34	375-IITA/CIMMYT; Developing and disseminating stress tolerant maize for sustainable food security in west, central and east Africa	Africa (Benin, Burkina Faso, Cameroon, Chad, Cote d Ivory, Ghana, Guinea, Mali, Nigeria, Togo, Senegal, Burundi, DR Congo, Ethiopia, Kenya, Madagascar, Rwanda, Sudan, Tanzania, Uganda	Maize crosses were made and/or selected all the sub-regions with the help of CIMMYT, IITA and national program scientists. In east Africa focus was on breeding and screening work, including attempts to increase stress-tolerance in locally adapted germplasm. In West Africa, benefiting from previous work undertaken by IITA, greater attention was given to screening available crosses against stress (drought, low nitrogen, Striga and stemborers) tolerance. Both in East and West Africa the project also worked on complementary crop management practices. Capacity of participating NARS was strengthened to breed, select and develop stress tolerant maize using key regional and national testing sites strengthened under the TAG. CIMMYT/IITA staff (from regional office as well as from Headquarters) served as resource persons in establishing testing sites and short-term training, workshops and in arranging visits for scientists from NARS. In addition, regional networks (ASARECA, CORAF, PAMA, WECAMAN) were supported to enhance inter-country collaboration. Attempts to transfer research outputs to farmers and to promote linkages with development work were commenced through innovative approach involving competitive grants to NARS scientists.	1.0 (1998 to 2002) On-going
35	386-ICIPE: Program for participatory development of environmentally-friendly pest management options towards sustainable vegetable cultivation by smallholders in sub-Saharan Africa.	Africa (Kenya, Uganda, Tanzania, Ethiopia)	The TAG successfully demonstrated farmer-participatory models for developing awareness of IPM and testing IPM options for intensive vegetable farming in smallholder agriculture. It tested and improved known IPM options of *Neem*-based biological pesticides and of the bio-control agent, *Bacillus thuringiensis*. However, in some of the participating countries these products were not commercially available, which proved to be a problem for implementation of recommendations at the national level. As a result of this research the viability of a modified Farmers Field School approach was fully demonstrated but the range of known IPM options were only minimally expanded. There was also some concern about limited support provided to women farmers outside of Kenya.	0.6 (1997 to 01) On going
36	408/408a/544-Global Forum for Agricultural Research (GFAR) - Research partnership and rural poverty alleviation	Global	GFAR initiative has started to mobilize key stakeholders in agricultural research (for development) to facilitate exchange of information and knowledge to strengthen national and regional agricultural research organizations. It is encouraging establishment of a truly global framework for development-oriented agricultural research. It is also helping to increase awareness among policy-makers and donors of the need for long-term commitment to, and investment in, agricultural research. Although still in formative stages, the first external review undertaken during 2000 was positive about its contributions to setting of the global research agenda and strengthening of regional/sub-regional fora.	0.3 (December 2001 - on-going)
37	411-CIP; Integrated Management of Potato Late Blight Disease	Global	This on-going global TAG is using participatory research methodology with the help of Farmers Field School (FFS) approach to screen and select potato varieties tolerant to late blight disease. The project has successfully established FFSs in a number of countries. The participating institutions have been	1.05 1999 to 02)

			trained in FFS approaches to undertake such work. Gender issues are receiving due attention. Field testing of promising genetic material is now underway However, a very ambitious project design, involving a large number of diverse institutions and scattered field sites is making it difficult to effectively implement and supervise the program in all countries.	
38	457-IITA: Poverty alleviation and enhanced food availability in West Africa through improved Yam technologies.	Africa (Benin, Cote d Ivoire, Ghana, Nigeria and Togo)	This on-going TAG is attempting to develop improved technologies for managing soil fertility, pests, identification of improved varieties of major cultivated species of yams. Work is also in progress to improve post-harvest storage and value addition options.	1.25 (1999-on-going)
39	485-ICARDA; Sustainable management of natural resources and improvement of major production systems of the Arabian Peninsula – Phase II	NENA (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, the United Arab Emirates and Yemen)	This on-going TAG is attempting to develop more productive and sustainable rainfed (rangeland) and irrigated production systems to achieve greater efficiency in use of water and improve rangeland/forage/livestock-systems and management practices. It includes support to strengthen national institutional and human resource capacity.	0.92 (2000 to 2005)
40	488-WARDA; Participatory adaptive research and dissemination of rice technologies in West Africa	Africa (Cote d'Ivoire, The Gambia, Ghana, Guinea)	This on-going TAG is helping to strengthen capacities of national and local development partners to better adapt and disseminate available technologies to smallholder rice producers.	1.0 (2000 to 03)
41	531-ICLARM; Community based fisheries management (CBFM) in South and South East Asia	Asia (Bangladesh and Vietnam)	This on-going TAG is helping to develop innovative CBFM models with a special reference to equity and sustainability; and to inform and influence policies operating within the sector.	0.65 (2001 to 04)
42	543-ENDA; Evaluation of impact of research partnerships	Africa (Niger, Mali)	This on-going small grant is attempting to develop models to enhance farmers' capacities to innovate and try out solutions to their particular problems; and for collaboration between scientists, development workers and farmers for participatory research through cross-fertilization of scientific and indigenous knowledge.	0.1 (2001 to 03)